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Exploring and developing domain-specific reasoning in primary English

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Abstract

The importance of teaching reasoning in schools is widely recognised. Yet this has presented teachers with difficulties, particularly in primary education. This partially stems from the lack of cohesive theory about reasoning for education, and the lack of specificity about it in the English National Curriculum. This research aims to stimulate explicit teaching of reasoning in primary English lessons. Drawing on socio-cultural theory and cognitive history, a theoretical framework of five reasoning 'styles' important within English has been constructed.

Four main task structures were developed to explore the feasibility of targeting three reasoning styles in English lessons: genre-based reasoning (GRE), analogy-based reasoning (ARE) and language-based reasoning (LRE). Exploratory activities were used with groups of KS2 students from five classes across two schools. Two main group types were audio-recorded: researcher-supported and independent groups.

Transcripts of 25 audio recordings from 11 lessons were coded using an adapted version of the Cambridge Dialogue Analysis Scheme (CDAS). Additional codes were developed to operationalise domain-specific reasoning in English. Examples of reasoning turns were analysed using the SOLO taxonomy to indicate the level of understanding demonstrated. The theoretical framework of reasoning styles and the accompanying coding instrument represent original contributions to existing research.

Three main findings emerge from data gathered during the exploratory investigation. First, the three reasoning styles targeted in the empirical phase of the study are realisable in the primary classroom; they can be promoted, captured, operationalised, and measured. Findings indicate that students participating in these collaborative activities spent, on average, about one fifth of the total discussion engaging in domain-specific reasoning. Second, proportions of domain-specific reasoning appear to vary according to task structure used. Odd one out and diamond ranking tasks tended to promote domain-specific reasoning most readily. Third, proportions of domain-specific reasoning appear to vary according to the presence or absence of adult support in groups. Usually, having adult support increased the likelihood of students engaging in domain-specific reasoning in English.

Exploring and developing domain-specific reasoning in primary English

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Declaration

No part of the material provided has previously been submitted by the author for a higher degree in Durham University or in any other university. All the work presented here is the sole work of the author and no one else.

An introduction to ideas developed in this thesis has been published as Oliver (2019).

Discussion of task structures for developing primary writing has been published as Oliver (2020).

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1 Introduction

1.1 Research aims

There is widespread recognition of the importance of teaching reasoning in schools (e.g. McPeck, 1981; Trilling & Fadel, 2009). Along with related constructs such as argumentation, reasoning holds an important role in approaches like 21st Century Skills (Asterhan & Schwarz, 2016; Chalkiadaki, 2018; Joynes, Rossignoli, & Fenyiwa Amonoo-Kuofi, 2019; Scott, 2015), educational goals designed to prepare students to be able to participate in democratic societies through processes of "civilised, rational, collaborative reasoning" (Asterhan & Schwarz, 2016, p. 164). While overwhelmingly advocated, teaching of reasoning has presented schools and teachers with difficulties, particularly in primary education (Mercer & Howe, 2012; Nickerson, Perkins & Smith, 2013; Wegerif, 2010). A lack of cohesive and uncontested theory around reasoning and how it should be embedded within education compounds these difficulties. It is also suggested that teachers find it difficult to understand principles underpinning research into thinking and reasoning and struggle to modify their practice in light of such research (Billings & Fitzgerald, 2002; Lefstein, 2008; Mercer & Howe, 2012; Sedova, Salamounova & Savricek, 2014). Moreover, the limited focus on reasoning in the National Curriculum (Department for Education (DfE), 2014), particularly in relation to specific subject areas, further complicates matters for schools and teachers.

This project aimed to stimulate explicit teaching of reasoning in primary English lessons. This ambition is motivated by my own experiences as a primary school teacher following an undergraduate degree in English. As subject co-ordinator for mathematics, the promotion of reasoning was at the heart of my efforts with mathematics school policies and when implementing opportunities for staff continuing professional development (CPD). Yet reasoning was rarely reflected upon outside of mathematics (except, perhaps, for science). While teaching in Year 6 for several years, it was common that I requested students to justify their inferences about texts as readers (and their decisions as writers). SAT reading tests also requested such explanations. Yet ways to support the process of learning to reason in English were not explicitly considered or addressed (through CPD or in school policy documents for instance). The lack of explicit guidance in the National Curriculum (DfE, 2014) about reasoning practices in primary English did not help to clarify questions about how reasoning manifests in other subjects. Perhaps partly because of the perceived subjective nature of English, any focus on reasoning practices in this subject seems overlooked.

To achieve this aim, two main research questions (RQ) guided the project:

RQ 1: What styles of reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?

RQ 2: Can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?

It is important to distinguish the concept of *reasoning styles* from that of *learning styles*, the latter of which bears no relation to reasoning styles as explored here. The concept of reasoning styles relates to different ways of forming and defending conclusions, which vary across disciplines (Bueno, 2012; Crombie, 1995; Hacking, 2012; van Drie & van Boxtel, 2008). Reasoning styles have been defined as "a pattern of inferential relations that are used to select, interpret, and support evidence for certain claims" (Bueno, 2012, p. 657). The first research question aimed to explore the styles of reasoning drawn upon in English literature and required in the teaching of English in primary schools in England (primary English). This question essentially sought to discover how reasoning manifests itself in this subject. To address this question, a theoretical framework of reasoning styles important within English was constructed, based on analysis of the discipline.

The second research question asks whether it is possible to promote or provoke these reasoning styles in the primary classroom using scaffolding tasks. To address this question, tasks were selected to promote collaboration and dialogue and to facilitate the process of learning to reason. These tasks were developed with teachers in two primary schools. Discussion within groups of children working independently or with me as researcher and their teacher on these tasks was audio recorded. These recordings were transcribed and a coding framework for operationalising and measuring domain-specific reasoning in primary English was developed. (Domain-specific reasoning refers to the styles of reasoning identified as important during the process of forming conclusions within a domain). Findings were grouped into three main areas: consideration of whether reasoning styles in the framework are realisable in the primary classroom; consideration of variation in the overall proportions of domain-specific reasoning according to task structure used; and consideration of variation in the overall proportions of domain-specific reasoning according to presence or absence of adult support during the group task.

1.2   Previous research

This study builds on several theoretical perspectives and strands of previous research. *Sociocultural theory* (e.g. Vygotsky, 1978; Wertsch, 1991) argues that knowledge and reasoning develop within cultures before becoming internalised by individuals. Language and other tools are used to mediate knowledge (Mercer, 2000; van Drie & van Boxtel, 2008; Vygotsky, 1962, 1978; Wertsch, 1991) and emphasis is placed on communication and interaction (Fernández, Wegerif, Mercer, & Rojas-Drummond, 2001; Howe, 2010). Reasoning in sociocultural theory is conceptualised as a cultural phenomenon developed by, and belonging to, particular cultures and contexts. In this project, academic domains represent different cultures. The study argues that subject domains have developed styles of reasoning to draw conclusions as a result of interactions between people, over time.

Sociocultural tenets are also developed within *communities of practice theory* (CoP) (Lave, 1988; Lave & Wenger, 1991). It is suggested that "communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavour" (Wenger-Traynor & Wenger-Traynor, 2015, p. 1). This has clear parallels to the argument that reasoning is developed within academic cultures, or communities. Similarly, CoP emphasises the importance of participation which is also likely to rely on language and interaction. This perspective includes a focus on context and the immediacy of the interaction in relation to the specific situation, or the 'situated' nature of thinking.

Dialogic teaching builds upon a rich history of discussion emphasising the benefits and uses of language to learning and is widely advocated in research (Alexander, 2008; Littleton & Mercer, 2013; Michaels & O'Connor, 2013). It is explored in depth and applied to the primary curriculum by a seminal figure in dialogic teaching research: Robin Alexander (2008, 2018). Alexander proposes five principles suggesting that dialogic teaching is: collective, reciprocal, supportive, cumulative, and purposeful (2008, p. 38). Focus on high-quality dialogue in this theory, and emphasis on reasoning as part of this dialogue, is particularly relevant to the present study.

Collaborative learning is linked to goals of dialogic teaching and is also drawn upon in this study. Potential learning gains of collaborative learning approaches to primary-aged students are made clear in the Education Endowment Foundation's (EEF) Teaching and Learning Toolkit (2018). Despite

widespread recognition of benefits of collaborative approaches, research indicates the scarcity and poor quality of much groupwork in UK classrooms (Blatchford et al., 2003; Howe, 2017).

Literature on task design and structure is also relevant to this study. The importance of teachers and their selection of appropriate scaffolding tasks has been emphasised (Blatchford et al., 2003; Wood, Bruner, & Ross, 1976). However, research has indicated difficulties faced by teachers when selecting and designing tasks to promote collaboration and dialogue (Bennett & Dunne, 1992; Blatchford et al., 2003; Harwood, 1995). Leat and Higgins (2002) focus on task design in their conceptualisation of 'powerful pedagogical strategies' (PPS). Specific task structures are provided in *Thinking Through Primary Teaching* (Higgins, 2001) which are amenable to adaptation across the curriculum. These are drawn upon in this study. Lotan (2014) also considers requirements for collaborative tasks and suggests criteria for 'groupworthy' tasks. Parallels can be drawn between criteria proposed by Leat and Higgins and Lotan and represent a useful starting point for addressing the second research question in this project.

While sociocultural theory and CoP theory represent strong theoretical underpinnings of this project, supported by research into dialogic and collaborative methods of teaching and learning and consideration of task design, research into the notion of reasoning styles explicitly relates to the study's aims and research questions. Reasoning styles have been defined as "a pattern of inferential relations that are used to select, interpret, and support evidence for certain claims" (Bueno, 2012, p. 657). The concept of reasoning styles draws on the academic field of *cognitive history* (Nersessian, 1995, Netz, 1999, Tweney, 2001). Cognitive historians seek to explain the interaction between *external* (cultural) and *internal* (cognitive) reasoning by examining written material and arguing that reasoning can be found as ways of arguing in discussion and written texts.

The concept of reasoning styles has been explored in other academic subjects, and most extensively in science. Alistair Crombie (1995), following the cognitive history tradition, developed a framework of six styles of scientific reasoning after extensively studying European scientific texts spanning two thousand years. Crombie's research provides a framework for identifying styles in other academic domains, through analysis of written material and immersion in a culture. This project aims to follow Crombie's lead and identify reasoning styles suitable for primary English, using tools from sociocultural research in their exploration. It is believed that this approach will enable both RQs to be answered.

1.3   Data collection and analysis

Data was collected from five classes from across KS2 (Years 3, 4, 5 and 6) in two primary schools in Sunderland across a period of approximately six months. Classes typically had 30 students each and there was a fairly even balance of boys and girls. The two schools represent different types and socio-economic demographics and have differing proportions of students eligible for free school meals (FSM). School A is a junior school (admitting students aged 7-11 years). 45% of students on roll are eligible for free school meals. 0% of students have English as an additional language (EAL). 17% have special educational needs (SEN) with 1.5% having a statement of SEN. In 2019, 67% of students achieved the expected standard in reading, writing and maths at end of Key Stage 2 (KS2). School B is voluntary-aided primary school (with nursery provision). 14% of students are eligible for free school meals. 7% of students have EAL. 12% are identified as having SEN with just over 1% having a statement of SEN. In 2019, 70% of students achieved the expected standard in reading, writing in maths at end of KS2.

Lessons were planned collaboratively by me as the researcher and the class teacher, based on previously piloted activities. Four main task structures (odd one out, fortune lines, role on the wall and diamond ranking) were employed to target three reasoning styles (genre-based, language-based, and analogy-based reasoning) from the framework created in this project. Each reasoning style was targeted using at least three of the task structures. Each task structure was used to target at least two reasoning styles to permit comparison of activities across reasoning styles. This supported consideration of the extent to which the reasoning styles are robust and distinguishable from one another. Specific task requirements and foci were adapted according to the text(s) students were studying. Activities were usually completed in small groups of between two and four students and were audio recorded for transcription. Some groups worked independently, and some worked with me as the researcher and teacher. Groups always contained a different combination of students. No students worked with me twice and all students were recorded at least once. This helped to ensure that all children felt valued as participants in the project and meant that any domain-specific reasoning exhibited was taken from a broad range of students of varying attainment levels and with a range of individual characteristics. Tasks were designed to last between fifteen and thirty minutes although teachers were flexible with this and varied timings according to pupil engagement and their own judgement about the most appropriate amount of time needed.

Recorded data was then transcribed. Approximately 50% of recordings were transcribed by me as researcher and approximately 50% by a professional transcription service. Transcripts from the transcription service were then checked and amended by me in conjunction with audio recordings. Because I was part of data collection (and was therefore sometimes working with groups in audio recordings) and given my familiarity with the local dialect and accent, it was important that all transcripts prepared by someone else were checked for accuracy. Transcripts were then coded using an adapted version of the Cambridge Dialogue Analysis Scheme (CDAS) (Vrikki, Wheatley, Howe, Hennessy, & Mercer, 2018). CDAS was developed and extended for this study to include categories to capture the three reasoning styles targeted in English. This is explored fully in Section 4.12.

1.4   Structure of the thesis

The remainder of this thesis will expand on theories and arguments briefly introduced above. The Literature Review in particular will consider the theoretical frameworks and bodies of research underpinning the arguments of this thesis and the grounds on which the study aims and research questions were formed. It begins with an exploration of two main metaphors for learning: the acquisition and the participation metaphors. Theories and the main arguments developed in this thesis are considered in conjunction with these metaphors throughout. The Literature Review then moves to consider definitions of reasoning, including a definition offered by sociocultural theory. The concept of reasoning styles is then explored, with existing research into the area considered. The Literature Review moves to consider the process of learning to reason. Within this section, the roles played by collaboration, dialogue, the teacher, and task design are explored.

After the Literature Review chapter, the methodology section is divided into two main studies. Study One represents the conceptual enquiry phase of the project and mainly addresses RQ1. It details the methods used to create the framework of reasoning styles for English and explicates criteria guiding their selection and inclusion. The second half of Study One presents the framework of five reasoning styles for English which emerged out of analysis undertaken during the conceptual enquiry phase. Study Two addresses the project's second RQ (which includes two sub-questions) and represents the empirical phase of the study. Methods for data collection are detailed. This chapter also presents the coding framework developed and the task structures drawn upon.

Study One addresses the methodology and findings for RQ1. Study Two presents the methodology for RQ2 and is followed by the Results and Analysis chapter which details and explores the main findings. This chapter is organised into three main sections. The first section considers evidence about the occurrence of each of the domain-specific reasoning styles and aims to explore whether evidence suggests that the three targeted styles are realisable in the primary classroom. The second section offers task-based reflections. The four main task structures used are considered alongside proportions of subject-specific reasoning each structure promoted. The third section of the Results and Analysis chapter considers proportions of domain-specific reasoning according to the presence or absence of adult support. Data is contrasted for groups working with me as the researcher and others working independently.

The Discussion chapter then expands on three main messages which emerged from data presented in the Results and Analysis chapter. Findings related to the realisability of styles of reasoning in the primary classroom and the variation in proportions of domain-specific reasoning according to task structure and level of support are critically examined alongside existing literature.

The Conclusion outlines limitations of the study and discusses ways in which these have been considered during the research process. Theoretical and methodological contributions the project makes are discussed, as well as considering contributions to research on classroom practice. Possible directions for future research are then considered.

2 Literature Review

This project is primarily concerned with the process of learning to reason. It aims to stimulate this process by using a reasoning styles framework and with support from open-ended task structures suitable for a classroom environment. Discussion will therefore focus on the process of learning to reason as a student rather than the practice of reasoning in a developed, 'adult' sense. This chapter will begin with an exploration of the nature of the learning process itself.

2.1 The nature of learning

It is helpful to consider two main metaphors for learning which have emerged over time: the *acquisition metaphor* and the *participation metaphor* (Sfard, 1998). The acquisition metaphor is the longest-held metaphor for learning and assumes that learning is something one can acquire in the form of knowledge, conceptual understanding, or schemas. Piaget's emphasis on the development of schemas can be considered alongside the acquisition metaphor. Recognising the importance of the social as well as affective dimensions within the learning process is an important development to our understanding of the learning process (Wells & Edwards, 2013). The participation metaphor, in contrast to a focus on individual learning in the acquisition metaphor, emphasises the action of becoming a participant in a particular community or context: "the permanence of *having* [in the acquisition metaphor] gives way to the constant flux of *doing*" (Sfard, 1998, p. 6, emphasis in original). Vygotsky's ideas are influential within this metaphor, particularly in his conception of a student moving from the status of follower to becoming a competent participant with full agency (Sfard, 2009). Sfard's *Metaphorical Mappings* (Sfard, 1998, p. 7) (Table 2.1) is a useful source for illustrating the main differences between the two metaphors.

The Metaphorical Mappings

Acquisition metaphor		Participation metaphor
Individual enrichment	Goal of learning	Community building
Acquisition of something	Learning	Becoming a participant
Recipient (consumer), (re-)constructor	Student	Peripheral participant, apprentice
Provider, facilitator, mediator	Teacher	Expert participant, preserver of practice/discourse
Property, possession, commodity (individual, public)	Knowledge, concept	Aspect of practice/discourse/activity
Having, possessing	Knowing	Belonging, participating, communicating

Table 2.1 Sfard's Metaphorical Mappings (1998, p. 7)

Despite attempts to distinguish between the two main metaphors for learning (and their epistemological and ontological underpinnings), and despite the polarisation which has occurred in the literature, this metaphorical dichotomy is far from clear-cut. In a seminal paper, Sfard (1998) argues that it is both necessary and possible to retain both metaphors for learning. She describes the two metaphors as "incommensurable" rather than "incompatible" (1998, 2009). While the epistemological and ontological discussion in Sfard's paper is illuminating, for the purpose of this project, where emphasis remains on the pragmatic focus of using theoretical ideas for the benefit of classroom practice, her eloquently expressed arguments referring to instruction are particularly insightful: "when a theory is translated into an instructional prescription, exclusivity becomes the worst enemy of success" (1998, p. 10); "theoretical exclusivity and didactic single-mindedness can be trusted to make even the best of educational ideas fail" (1998, p. 11). Sfard offers a strong argument for retaining and drawing upon both metaphors for learning.

Ideas developed in this thesis can be captured by both the acquisition and the participation metaphors. On the one hand, sociocultural theory is drawn upon as a means of exploring and explaining the process of internalisation of reasoning processes developed as part of a community. While the importance of 'doing' and 'action' in collaborative group work draws upon demands for participation, ultimately, the change in the individual as a result of internalisation implies acquisition of knowledge or reasoning processes. Yet on the other hand, the processes of collaboration and principles of dialogic teaching and learning also drawn upon in this thesis emphasise the importance of the process of reasoning (rather than the 'product' which is acquired) to the development of participants within a given disciplinary community. Ultimately, this project aspires to develop students who can act (in this case, by participating in disciplinary styles of reasoning), in disciplinary-established, discipline-specific and disciplinary-required ways. It may be hoped that this becomes

internalised by individuals, but this is not required or measured here. Indeed, there is no attempt to measure in any way whether discipline-specific reasoning has been internalised by students in this project (if such measurement would even be possible). This points to an earlier comment about the important distinction to be made explicit: this project is primarily concerned with the process of learning to reason.

2.2   Reasoning and learning to reason

Reasoning has been subjected to multiple, sometimes conflicting definitions within different academic domains. It has typically been explored within a psychological framework which focuses attention on individual innate reasoning as a cognitive process. Reasoning in the psychological perspective can be viewed alongside the acquisition metaphor for learning where reasoning is a cognitive skill to be developed and acquired. However, this approach has been criticised for failing to attend to higher-order reasoning beyond those innate processes (Fodor, 1983). Philosophers have also considered reasoning focusing on ideas such as critical thinking, logic, norms and values and frameworks of argumentation (e.g. see Brandom, 2009; Kuhn, 1991; Toulmin, 1958). Brief consideration of some philosophical perspectives will now be presented.

2.2.1 Argumentation versus logic models of reasoning

Development of the style of *analytic philosophy* at the start of the twentieth century emphasised the importance of formal logic. This prizes validity when judging arguments and demands that conclusions follow from premises with absolute certainty (Nussbaum, 2011). Yet the uncertainty inherent within most domains questions the value of such strictly deductive requirements in formal logic.

In response to emphasis on the importance of formal logic as the foundation for argument, discussion moved instead to focus on *models of argumentation*. Argumentation has been defined as

"a process of thinking and social interaction in which individuals construct and critique arguments" (Nussbaum, 2011, p. 84). Voss and Means define argumentation as "the generation and evaluation of arguments" (1991, p. 4) and argue that skill in argumentation is fundamental to the development of reasoning (see also, Voss & Means, 1991). Distinctions can be drawn between *analytic argumentation,* associated with formal logic and syllogisms, and *informal argumentation*, associated with terms such as *dialectic* (Aristotle & Cooper, 1960) *quasi-arguments* (Perelman, Olbrechts-Tyteca, Wilkinson, & Weaver, 1969) and *probabilistic* arguments (Voss, Perkins, & Segal, 1991). Voss and Means (1991a) suggest that informal argumentation can be identified in virtually all domains although the types of reasons used to support claims vary according to subject matter. This links to the notion of discipline-specific reasoning styles developed in this project. The authors also define reasoning in relation to argumentation: "reasoning is a mental process that usually takes place via the use of argument, or, more strongly, argument structure is viewed as the form of discourse by which reasoning usually takes place, a type of syntax for reasoning" (Voss & Means, 1991, p. 10). Thus, conclusions or inferences made by an individual are supported with justifications (permitting the move from premise to conclusion). While deductive reasoning might offer a premise, reasoning might also seek to provide support for a claim, to generate reasons for an inference or conclusion. This calls upon argumentation structures (Voss & Means, 1991).

Voss and Means argue that teaching argumentation is potentially beneficial to the enhancement of reasoning skills and to the development of subject knowledge (1991a; 1991b). They support this argument by presenting research which suggests that children of school age generally have poor or limited reasoning capacities (Resnick & Resnick, 1992) and by acknowledging that informal reasoning is used across most subject domains and is thus integral to education. Particularly relevant to the argument of discipline-specific reasoning developed in this thesis, Voss and Means (1991b) suggest the possibility of argumentation instruction leading to a better understanding of arguments found in different subject domains. They advocate co-ordinating argumentation instruction within subject domains hypothesising that this will support students to use argumentation as a tool in relation to that subject matter at least (1991a). This ties into arguments about whether reasoning is domain-specific, domain-general or operating between and across both (see Section 2.4). Voss and Means also suggest that "accessing a list of types of reasons may facilitate the production of additional arguments, the list serving as a cue that is used to search mentally for additional information pertaining to the issue at hand" (1991a, p. 27). This supports arguments developed in this thesis about the importance of making discipline-specific reasoning styles explicit, particularly during the process of learning to reason.

Toulmin (2003) is one of the leading figures dominating discussion about structures of argumentation. He proposed six basic invariants representing the structure of most arguments, regardless of domain: claim (or conclusion), grounds (or data), warrants (linking grounds to claims), backing for warrants, rebuttals, and modal qualifiers (indicating the strength conferred by the warrant) (Toulmin, 2003). Other models of argumentation have also been developed (e.g. Walton, 2007) although these are not considered in detail here. Such models of argumentation recognise the elements of uncertainty inherent across many domains which prevent the widespread use of formal logic as a method of judging arguments and reasoning. Like Voss and Means (1991a; 1991b), Toulmin recognised the differences in domains and the evidence required within them. He suggested that the backing for arguments (and the types of evidence used for such backing) differed between domains (2003). Toulmin therefore argued for the importance of recognising and using domain-specific standards to support judgements about the strength of arguments (Nussbaum, 2011). This has clear parallels to a central argument developed in this thesis: that different academic domains have developed different styles of reasoning to draw conclusions and decide which ones count as valid. Toulmin's arguments can therefore be considered alongside the theory of reasoning styles explored later (see Section 2.6).

This thesis acknowledges definitions and frameworks referred to above and will now offer discussion of another framework within which reasoning can be explored and defined: the *sociocultural framework*.

2.2.2   Sociocultural theory

Psychologists have tended to consider innate and individual reasoning rather than reasoning bound within cultures. Psychological theories also tend to emphasise the 'acquisition' of reasoning skills within learning development. Philosophical theories have tended to focus on general principles of reasoning without considering the differences in real life contexts. In contrast, sociocultural theory is a perspective which explicitly considers the cultural influence on thinking, learning and communication and the relationships between these processes (Daniels, 2001; Mercer, 2007; Wells & Claxton, 2002; Wertsch, 1985). It departs, to some extent, from the purely 'acquisitionist'

perspectives which view reasoning processes specifically (and learning generally) as knowledge or understanding to be 'gained' by the individual.

Often associated with Vygotsky (e.g. 1978), sociocultural theory expands reasoning from something that exists in the mind of an individual as thinking, to something which is played out in public, as "talking and arguing and showing" (Hacking, 1992, p. 3). Within the sociocultural framework, reasoning exists as a cultural phenomenon. Rather than being solely an individual cognitive process (as in psychological theory) or associated with norms and values for critical reasoning (as in some philosophical approaches), knowledge and reasoning is considered to exist first in society before becoming internalised by individuals. To quote Vygotsky: "every function in the child's cultural development appears twice: first on the social level, and later, on the individual level" (1978, p. 57). Developing the skills to operate as fully functioning members of complex and changing social worlds has also been described as *cultural intelligence* (Herrmann, Call, Hernández-Lloreda, Hare, & Tomasello, 2007; Mercer, 2013).

In sociocultural theory, language and other tools are used to mediate knowledge (Mercer, 2000; van Drie & van Boxtel, 2008; Vygotsky, 1962, 1978; Wertsch, 1991; Wolfe & Alexander, 2008). Relationships between Vygotsky's notions of the *intermental* (social) and *intramental* (psychological) (1978) processes are therefore considered in sociocultural theory. The importance of communication and interactions with others is foregrounded (Fernández, Wegerif, Mercer, & Rojas-Drummond, 2001; Howe, 2010): knowledge is shared and understandings of shared experiences are constructed jointly (Mercer, 2007). This links to Tiberghien and Malkoun's (2009) consideration of theoretical views of knowledge where the procedural components as well as the content basis constituting 'knowledge' are recognised. Tiberghien and Malkoun suggest that "the taught knowledge in a classroom is largely enacted through oral and gestural productions, making it mainly interactional, and ephemeral" (Tiberghien & Malkoun, 2009, p. 42). This therefore embraces sociocultural tenets emphasising the active role and co-dependence of learners. These sociocultural principles also form the theoretical basis for the notion of dialogic teaching and learning (Alexander, 2008; Littleton & Mercer, 2013; Michaels & O'Connor, 2013). This is explored further in Section 2.7.1.

Thus, in contrast to psychological and philosophical ideas, sociocultural theory places reasoning as a cultural phenomenon, invented by and part of cultures. With the predominance of groups and communities in society, sociocultural theory recognises the importance of shared ways of thinking, communicating, reasoning and social practices within such groups (Mercer, 2007, 2013). The impetus to study reasoning within a culture, rather than simply with individuals, becomes apparent (Fodor, 1983; Berger & Luckman, 1966, 1991; Fuller, 2002). In this project, academic disciplines represent different cultures. It is argued that disciplines have developed styles of reasoning to draw conclusions and decide which ones count as valid arguments. These styles exist within the culture (or the academic discipline) before becoming internalised by individuals within it. Cultural reasoning draws upon the epistemic and social norms established in academic disciplines as well as their conceptual and procedural knowledge bases.

Often considered alongside sociocultural theory and also associated with Vygotskian ideas is *cultural historical activity theory* (CHAT) (Cole, 1996; Engestrom, Miettinen, & Punamaki, 1999; Leontyev, 2009; Luriia, 1976; Roth & Lee, 2007). Briefly, CHAT emphasises the importance of collective activity, mediated by tools. While careful examination and comparison of CHAT cannot be made here, the focus on social interaction and its importance for learning has clear parallels to sociocultural tenets and to the argument relating to reasoning styles presented here. The emphasis on mediating tools in CHAT also links to the use of scaffolding tasks in this project. CHAT is therefore conceptually consistent with the theory of discipline-specific reasoning styles.

Sociocultural theory can be considered in conjunction with both the acquisition and the participation metaphors of learning discussed earlier. Emphasis on participation and action within a community or culture clearly points to the participation metaphor. Table 2.1 in Section 2.1 illustrates that sociocultural theory seems to draw upon the participation elements within the *learning, student, teacher, knowledge/concept* and *knowing* dimensions. Within these dimensions, the participation metaphor emphasises participation and the process of becoming a participant. Despite seemingly subscribing to the participation metaphor of learning, sociocultural theory may indeed be more 'acquisitionist' in its implicit goal of learning. Table 2.1 suggests that the goal of learning in the participation metaphor is "community building" (Sfard, 1998, p. 7). This is not prohibited within sociocultural theory and is most likely encouraged. However, the stated goal within the acquisition metaphor is "individual enrichment" (Sfard, 1998, p. 7). Sociocultural theory highlights the

importance of participating in the practices of a given culture or community, yet with the ultimate goal of internalising these practices (Sfard, 1998).

This process of internalisation is explored in Mercer's paper (2013) which focuses on the concept of the *social brain*, linking ideas from neuroscience, evolutionary psychology, developmental psychology, social psychology, educational psychology, anthropology, sociolinguistics and linguistic philosophy (Dunbar, 1998; Zelazo, Chandler, & Crone, 2009). Mercer makes strong arguments for the value of collective reasoning without resorting to undue focus on individualistic purposes for collaborative reasoning processes (2013). He argues that this is still in keeping with sociocultural theory which examines the role of the individual within processes of collective thinking supporting the creation of "socially shared knowledge" (Mercer, 2013, p. 164). Mercer offers three potential explanations for how social (intermental) activity might influence individual (intramental) development: *appropriation, co-construction,* and *transformation*. *Appropriation* refers to the learning which can happen for an individual because of talking about and sharing with others relevant knowledge and strategies required during a task. This might also be applied to new problem-solving situations. Mercer identifies the weakness of this claim as a potential explanation for how joint thinking can support individual thinking, identifying the use of language merely as a means of transmitting information. The second explanation offered, *co-construction*, involves learners not only sharing ideas, but also arguing productively about them to develop new strategies for completing a task which are better than any individual could have devised. Individuals could then use these group-developed strategies when working on similar problems independently. The third and strongest theoretical claim offering a potential explanation for the process of moving from the social to the individual plane is termed *transformation*. Transformation relates to the experience of group discussion transforming the nature of individual reasoning. It is suggested that when norms of discussion require that reasoning be made explicit, argumentation involved in group situations might stimulate learner's metacognitive and critical awareness of their own reasoning. This links the intermental and intramental planes and offers a suggestion for a possible way in which social experiences can impact upon psychological development (Mercer, 2013).

2.3   Other theoretical perspectives

Sociocultural theory and its definition of reasoning as a culturally developed practice mediated by language is explicitly drawn upon in this project and will be referred to throughout the thesis (although its emphasis on internalisation is less developed here). Yet it is important to consider other theoretical perspectives which might complement the arguments expressed here to some degree. The next section will therefore discuss *communities of practice theory* (CoP), *threshold concepts, legitimation code theory* (LCT), the concept of *forms of knowledge*, and the notion of *disciplinary literacy*, commenting on aspects which have particular relevance for this project and considering these theories alongside the participation and acquisition metaphors discussed above. Focus will then briefly consider implications of these theories and others for considering reasoning as either domain-specific or domain-general before presenting the definition of reasoning offered in this thesis.

2.3.1   Communities of Practice

The concept of *communities of practice* (CoP) may serve as a response to concerns about the acquisition metaphor of learning. This notion firmly emphasises the participation metaphor (Hakkarainen & Paavola, 2009). The origins of CoP are found within learning theory (Lave, 1988; Lave & Wenger, 1991): "communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavour" (Wenger-Traynor & Wenger-Traynor, 2015, p. 1). Within this concept are three crucial characteristics: the *domain*, the *community,* and the *practice*. *Domain* refers to the specific domain members of the community of practice commit to and develop competence in. *Community* relates to the discursive and reciprocal activities members engage in where relationships are fostered to develop and share learning. *Practice* emphasises the active role of practitioner which members adopt, where resources and tools are shared to develop a shared practice over time (Wenger-Traynor & Wenger-Traynor, 2015, p. 2). Within CoP, knowledge is viewed as an element of cultural practice rather than as an objective entity in the world or in an individual's mind; it is through participation that learners become full members of a community (Hakkarainen & Paavola, 2009). This concept invites parallels to the reasoning styles theory developed in this thesis, particularly in terms of the tacit nature of CoP:

They are a familiar experience, so familiar perhaps that it often escapes our attention. Yet when it is given a name and brought into focus, it becomes a perspective that can help us understand our world better. In particular, it allows us to see past more obvious formal structures such as organizations, classrooms, or nations, and perceive the structures defined by engagement in practice and the informal learning that comes with it (Wenger-Traynor & Wenger-Traynor, 2015, p. 3).

By identifying the shared learning, knowledge and characteristics of a CoP, greater understanding of that community is encouraged. This relates to a key aim of this thesis: to explicitly identify the reasoning styles within English literature to foster an enhanced teaching and learning experience in primary English lessons.

2.3.2   'Troublesome' knowledge and threshold concepts

A further conceptual framework relating to tacit knowledge within a domain (or CoP), and in line with the participation metaphor of learning, is that of *threshold concepts* (Meyer & Land, 2003). Meyer and Land discuss five kinds of *troublesome knowledge* (2003). Perkins considers the last of these, *tacit knowledge*, suggesting "much of the knowledge we rely upon every day in both commonplace and professional activities is tacit; we act upon it but are only peripherally aware or entirely unconscious of it" (2006, p. 50). This relates to the tacit nature of CoP and connotes the reasoning styles considered in this project. Perkins identifies the efficiency benefit of knowledge operating tacitly yet also acknowledges the dangers: "learners' tacit presumptions can miss the target by miles, and teachers' more seasoned tacit presumptions can operate like conceptual submarines that learners never manage to detect or track" (2006, p. 50). To address these issues, Perkins suggests the constructivist approach of *surfacing and animating*:

> Get those tacit presumptions out on the table at least for a while…And not just as objects of discursive analysis but as systems of activity to engage. The idea is not simply to know about the game but to play the game knowingly (2006, p. 51).

Perkins also raises focus from troublesome knowledge in terms of concepts, to consideration of troublesome knowledge in disciplines characterised by their own *epistemes*:

> An episteme can be defined as a system of ideas or way of understanding that allows us to establish knowledge…epistemes are manners of justifying, explaining, solving problems, conducting enquiries, and designing and validating various kinds of products or outcomes (2006, p. 52).

He points to calls to promote understanding of disciplinary structures made by people like Bruner (1973) and Schwab (1978) and also indicates the difficulties faced by learners in their attempts to play the 'epistemic games' of disciplines: "many students never get the hang of it, or only slowly, because the epistemes receive little direct attention" (Perkins, 2006, p. 53; Collins & Ferguson, 1993; Perkins, 1994, 1997). This mirrors objectives of the present project. By explicitly identifying the underlying epistemes or 'rules of the game' for English literature, teachers and students can develop knowledge and understanding to enable them to participate more fully in the domain, or the community of practice. Threshold concepts and CoP theory therefore relate to the discipline-specific issues and practices considered in this thesis. This project hopes to give direct attention to those practices involved in primary English, rather than considering disciplinary issues more generally.

2.3.3   Legitimation code theory

Linking with goals to make tactic practices more explicit, *legitimation code theory* (LCT) (Maton, 2014; Maton, Hood, & Shay, 2016) is a social realist framework developed to explore the organising principles (*legitimation codes*) of situations. Developed from ideas expressed by Bernstein (1971, 1977, 1990, 2000) and Bourdieu (1977, 1990) and with attention paid to *systematic functional linguistics* (SFL) (Halliday, 2012; Halliday & Webster, 2009), LCT aims to explicate the organising principles which underlie different forms of knowledge practices. Concern for social justice and development of knowledge is demonstrated in the theory which focuses on illuminating and making visible the tacit 'rules of the game' within education and other social contexts to ensure that all learners are equipped with the required legitimation codes (see also Rose & Martin, 2012). This draws clear parallels to threshold concepts discussed above and to the constructivist aim of surfacing and animating. It also aligns with an aim of this research: to make reasoning practices involved in primary English explicit. However, LCT was not developed further in this project because other theories were considered more pertinent to the exploration of key ideas articulated in the research aims and questions. For example, the concept of reasoning styles (drawing on sociocultural theory), while incorporating some key features of LCT most appropriate to this study (such as the emphasis on making tacit issues explicit), openly engages with ideas relating to discipline-specific reasoning (which LCT does not focus on in any depth). Future research might consider the potential profitability of incorporating LCT into research designed to promote disciplinary-based reasoning practices.

2.3.4   Knowledge forms

The concept of reasoning styles specific to disciplines may draw some allusions to British philosopher Paul Hirst's conception of *knowledge forms* (1965, 1975). In his original conception, Hirst identified seven forms of knowledge (which closely map on to school subjects) arguing that initiation into these knowledge forms should represent the basis of a liberal education. Hirst's knowledge forms were initially presented as almost Platonic in their existence, although he later recanted this position instead claiming their cultural basis (Green, 1985; Hirst, 1975). Following the Wittgensteinian argument that categories of thought are given structure from forms of life, Hirst suggests that conceptual schemes are developed "by means of public language in which words are related to forms of life, so that we make objective judgements in relation to some aspect of a form of life" (Hirst, 1975, p. 93; Green, 1985). Hirst suggests that his theory of knowledge "differentiat[es]…modes of experience and knowledge that are fundamentally different in character" (Hirst & Peters, 1970, p. 63). Hirst therefore acknowledges the huge variations in the logical character of knowledge claims across forms of life recognising that judgements about the validity of such knowledge claims will differ according to the particular form of life (Green, 1985): "the relationship between words and some element of what is 'given' may vary. Indeed that is again just what the distinction between 'forms of knowledge' is all about" (Hirst, 1975, p. 94). These claims draw clear parallels to the arguments presented in this thesis. The separation of 'forms of life' alludes to the separation of academic domains (although the two should not be simplistically equated). The suggestion that each form of life judges the validity of knowledge claims differently also connotes the argument expressed here that each academic domain draws conclusions differently and in accordance with the domain-specific reasoning styles determining what is expected of valid reasoning practices. However, despite some resonance to the arguments made in this project, Hirst's theory has received considerable criticism. Criticisms have rested mainly on the basis of Hirst's use of the term 'knowledge' without clear justification for how these forms might actually represent knowledge (Smith, 1981; Warnock, 1977). The blurring of knowledge with similarly obscure and confusing uses of 'truth', 'meaning', 'experience' and 'objectivity' has also been criticised (Smith, 1981). Hirst's treatment of reasoning is also blurred (Green, 1985) and more implicit than the treatment made here.

2.3.5   Disciplinary literacy

Literature on *disciplinary literacy* is also relevant to discussion about whether reasoning is domain-general or domain-specific. It argues that disciplines have their own ways of reading, writing, communicating and reasoning, which should be taught across the school curriculum (O'Brien, Moje & Stewart, 2001; Shanahan & Shanahan, 2012). This view therefore emphasises domain-specific elements of literacy, while also acknowledging domain-general aspects. It is argued that by developing literacies within disciplines, students can be supported to develop "disciplinary habits of mind… practices consistent with those of content experts" (Fang, 2012, p. 20). These habits refer to different ways of knowing, doing and communicating in each subject (EEF, 2019; Shanahan & Shanahan, 2012). Disciplinary literacy, with its emphasis on subject-specific practices, is complementary to some major arguments expressed in this thesis. It is also becoming increasingly prevalent in education research, particularly in terms of secondary education (EEF, 2019). The *hybridity* approach to disciplinary literacy advocated by Hinchman and O'Brien (2019) builds on the various discourses which are part of learning spaces. This approach supplements literacy and disciplinary discourses with cultural beliefs, practices and resources from communities and schools (Hinchman & O'Brien, 2019; Easthope, 1998; Gutiérrez, Baquedano-López, & Tejeda, 1999). This draws clear parallels to the approach taken in this project, where consideration of disciplinary reasoning styles from the academic culture of English literature is supplemented with consideration of reasoning styles in primary English practices and materials.

2.4   Domain-specific or general reasoning

Consideration of sociocultural theory, CoP theory and others may have implications for views about whether reasoning processes are specific to (or situated in) domains or whether these can be generalised, or *transferred,* beyond those domains.

Some argue that reasoning is a general skill, transferable to other contexts and comprised of similar elements. Some research also supports this view. For example, in Kuhn's research (1991), philosophers, regarded by Kuhn as experts in reasoning itself, performed better than domain experts in terms of the quality of their reasoning. In addition, experienced teachers did not demonstrate

argumentative thinking of any higher quality when considering education compared to other topics like crime. Kuhn argues that forms of reasoning can be separated from content: "forms of reasoning [can] transcend the particular content and contexts in which they are manifested" (1991, p. 263). Piaget's theory of cognitive development also proposes a domain general view of reasoning (see Kuhn, 1988). These views may suggest the general nature of reasoning skills transferable beyond a single context.

However, other theory and research suggests the domain-specific nature of reasoning (Glaser, 1984; Hirschfeld & Gelman, 1994; Perfetti, Britt, & Georgi, 1995). Carey is one proponent of the domain-specific view and notes the lack of evidence to suggest developmental changes in the "cognitive machinery" of children (1985) (although she does allow for the possibility that general cognitive skills may eventually be identified). This domain-specific view is also developed in the theory of situated cognition (Brown, Collins, & Duguid, 1989), although this is not considered in detail here.

Depending on the metaphor for learning subscribed to, and implications for what constitutes knowledge within different theories, it may be questioned whether domain-general reasoning is even possible. Following the line of argument from proponents of the participation metaphor, it is possible to observe that rather than 'acquiring' a skill to be 'transferred', learners instead become competent participants within a community or context. The specificity of this context may prevent the possibility of 'transfer'. This links to the concept of CoP discussed above.

Moreover, the definition of 'knowledge' within different theoretical perspectives may have implications for consideration of whether reasoning is domain-specific or domain-general. Drawing upon Chevallard's anthropological theory of the didactic (ATD) (1991), Tiberghien and Malkoun discuss the meaning of 'knowledge' suggesting "it does not denote just content, but also includes the procedural components, the embedded epistemology of knowledge and the way its meaning is constructed" (2009, p. 42). Chevallard theorised knowledge in terms of the metaphor of life arguing that knowledge 'lives' within particular groups, societies and institutions (Tiberghien & Malkoun, 2009). This resonates in some ways with other theories, metaphors and concepts discussed in this chapter, such as sociocultural theory, CoP theory and the participation metaphor for learning. It also links to the reasoning styles concept to be developed throughout the thesis. When conceptualised in

this way, knowledge and learning (including learning of reasoning practices) are tied to communities, contexts and situations, thus minimising concern for the issue of transfer or generality.

Others adopt a middle ground approach to the domain-specific versus domain-general debate. For example, Perfetti, Britt and Georgi argue that historical reasoning is "neither specifically historical, nor fully general" (1995, p. 5). van Drie and van Boxtel similarly argue that "historical reasoning requires general reasoning skills, but also contains several characteristics that are more specific to this particular domain" (2008, p. 104). Similar claims are made for other academic domains. Sternberg suggests that asking questions about whether information processing and representation is either domain-specific or domain-general is "neither meaningful nor answerable" (1989, p. 115). Instead, Sternberg suggests that efforts should be focused on examining the ways in which these processes are both domain-general and domain-specific and on exploring the interactions between general and specific aspects.

This links to broader discussion about whether the nature of thinking is always general or always specific and to the arguments offered to create a more nuanced understanding of both domain-specific and domain-general processes. For example, McPeck (1981) disputes the possibility of general thinking skills arguing that academic disciplines represent different "forms of life" requiring specific logics, (or reasoning practices). Yet Higgins and Baumfield (1998) illustrate flaws in the three main logical objections against general thinking skills. Briefly, the authors argue for a more critical examination of the presuppositions within a priori arguments, to include a more rigorous definition of thinking skills accompanied by description of how this might manifest in expert thinkers. In addition, Higgins and Baumfield identify the potential overlaps between domains which might render general thinking skills possible and minimise the exclusivity of domain-specific positions. Finally, the authors suggest that expert-thinkers may use more than just detailed subject-specific knowledge or that this knowledge may have been developed partly as a result of the application of general thinking principles at an earlier stage in their learning. The distinction made by Higgins and Baumfield, in terms of the process of learning and the end state of 'expert', is similar to the distinction made in this project, between the process of learning to reason and reasoning itself. Thus, teaching of reasoning styles may help students with the process of learning to reason.

Wegerif (2007) responds to considerations of domain specificity in thinking by arguing that instead of considering thinking skills based on a model of a mechanism, they should instead be conceptualised in terms of a model of engagement in dialogue. Thus, rather than rely on the need to have evidence of automatic transfer functions within the brain as a result of learning general thinking skills, one should consider the gains made possible (across domains) as a result of learning how to engage effectively in dialogue. This also broadly aligns with the position offered in this thesis. While domain-specific reasoning practices can be operationalised, taught and captured in primary English, these (primarily dialogic) practices *may* also be of some value in other subjects or domains (although claims or evidence in favour of this stance are not offered).

While a comprehensive overview of the domain-specific versus domain-general debate is not possible, this section presents an overview of the main positions within this debate and provides details of some theory and research in this area. Given the lack of convincing evidence to suggest that reasoning is either fully domain-specific or fully domain-general, adopting a 'middle-ground' approach might be required. While the concept of discipline-specific reasoning styles might point to domain-specificity, it is possible that there may be structural similarities in reasoning styles which are useful across subject areas.

Based on arguments, metaphors and conceptualisations discussed here, the following section will present the definition of reasoning to be adopted in this project and will then turn to the concept of reasoning styles.

2.5   Reasoning definition

Some contradictory frameworks for reasoning across academic disciplines were explored in the previous section. Disagreements about how, or indeed whether, reasoning can be 'acquired' and regarding the processes involved have also been presented. This confusion must be minimised by presenting the definition drawn upon in this thesis. Thus, a broad definition of reasoning as "the process of drawing conclusions" (Leighton, 2004, p. 3) will be adopted. This is because it encompasses many widely held beliefs about what reasoning involves, and because it fits with a

common-sense understanding held within wider society, including schools. This is particularly important given that this project aims to explicate what reasoning within an academic culture looks like before operationalising this understanding into teaching activities. The project will also draw upon the sociocultural framework in that it considers reasoning to exist within cultures. This reasoning is then mediated to individuals through language and may eventually become internalised (although claims of internalisation are not sought nor offered here). The principle argument to be developed is that academic domains, or cultures, have developed styles of reasoning (Crombie, 1994, Hacking, 1992, 2012), which can be found as ways of arguing in debates and written texts. It may be evident from the definition of reasoning adopted in this thesis that both the acquisition and the participation metaphors for learning are implied. While discussion of 'internalisation' is essentially 'acquisitionist' in nature, the project does not focus on whether practices have been internalised (if this could even be operationalised and reliably measured). Instead, the primary focus is placed on prompting, provoking and scaffolding students' reasoning practices according to a framework of reasoning styles applicable to a domain and context. The intention is that students become active participants within a disciplinary community and develop agency in these roles. This aligns with the participation metaphor of learning. Discussion will now move to focus on the concept of reasoning styles.

2.6   The concept of reasoning styles

2.6.1   The 'styles' concept

As part of sociocultural theory, reasoning is considered to be a cultural phenomenon invented by and part of cultures. Academic domains represent different cultures. Reasoning styles are defined as "a pattern of inferential relations that are used to select, interpret, and support evidence for certain claims" (Bueno, 2012, p. 657). It is argued in this project that disciplines have developed styles of reasoning to draw conclusions and decide which ones count as valid arguments. This domain-specific approach to reasoning styles has been developed and explored in some fields (most notably in science, considered below) yet has been largely ignored in others (particularly arts-based domains).

The concept of reasoning styles draws upon the academic field of *cognitive history* (Nersessian, 1995; Netz, 1999; Tweney, 2001). Cognitive historians study historic and recently published papers and books, pedagogical texts, lab notes and other written material to explain the interaction between *external* (cultural) and *internal* (cognitive) reasoning. It is suggested that reasoning can be found as ways of arguing in discussion and written texts, in line with sociocultural theory. Thus, in order to describe the reasoning styles drawn upon in an academic discipline, it is necessary to look towards the culture of interest (Carrithers et al., 1990; Hacking, 1982; Roth, 1987; Taylor, 1982; Ziman, 1978). For example, to learn how to reason effectively in science, it is necessary to study this academic culture. By extensively studying European scientific texts spanning two thousand years, Alistair Crombie (1995), as part of the cognitive history tradition, devised a framework to describe six key styles of reasoning in science.

Discussion of discipline-specific practices, genres, ways of thinking and reasoning represents an important consideration in educational discourse. Drawing on theories such as CoP and the importance of *surfacing and animating* tacit ideas or practices (see Sections 2.3.1 and 2.3.2), it is hoped that this project can help to provoke and stimulate particular styles of reasoning in English in order to promote fuller participation of students in this discipline. Mercer argues that "achieving competence in specific subjects requires the use of specialised discourses, or genres, of subject communities"; he considers these "genres" to represent "cultural tools designed for pursuing collective scholarship and inquiry" (2013, p. 153) (see also, Christie & Martin, 1997; Kress, 1987; Swales, 1990). This builds upon discussion in linguistics, where genres have been considered "goal-oriented social processes" (Martin, 1993, p. 142). Bakhtin also indicated the existence of such discipline-specific language features: "all the diverse areas of human activity involve the use of language. Quite understandably, the nature of forms of this use are just as diverse as are the areas of human activity" (Bakhtin, 1986, p. 60). According to Mercer, genres in specific subjects "represent ways that individual thinking is made accountable to the normative rules of collective activity within specific communities of thinkers" (2013, p. 153). These genres require certain types of language and demand participation in practices (including reasoning practices) required within that discipline. In line with the aim of this project, Mercer (2013) goes on to suggest that developing fluency in the genres of a discipline or community is required to gain full admission into this community.

2.6.2   Styles in science

Interest in reasoning styles in the current project has been heavily influenced by developments in thinking and theory within science in relation to scientific styles of reasoning. Development in science was prompted by several movements in the discipline. Firstly, it was influenced by the "naturalistic turn" in science philosophy (Callebaut, 1993), which was triggered by the fall of logical empiricism and positivism in the 1950s (Quine, 1951). Instead of searching for normative principles underpinning scientific reasoning, academics turned to historic and sociological descriptive analyses (Kuhn, 1962) and approached reasoning as a historic and collective product. In this 'anti-positivist' view, scientific reasoning is not formed by any universal objectivity, but rather it is the culturally developed reasoning that settles what is to be objectively true (Hacking, 1992). This also links to demands to change towards ethnographic argumentation (Prior, 2005) in particular cultural domains. Secondly, developments in science in relation to reasoning styles has been supported by the development of sociocultural learning theory, emphasising the cultural formation of the mind (Wertsch, 1985). Together, these two rationales are used as an argument that higher order reasoning at a cognitive level should not be read out of psychological studies of the individual, but rather from historic and sociological studies of the science culture (Fodor, 1983; Netz, 1999). In his "first law of the nonexistence of cognitive science" (1983, p. 107), Fodor powerfully argues that cognitive psychology has failed to understand higher order reasoning, and has only described lower level, innate reasoning.

Crombie's (1995) three-volume publication, *Styles of scientific thinking in the European tradition,* describes six styles of thinking (described as "reasoning" and later "thinking and doing" by Crombie's then PhD student and assistant, Ian Hacking (1992, 2012)). These styles were identified following extensive analysis of European scientific texts spanning over two thousand years. They are summarised by Hacking:

a) The simple method of postulation exemplified by the Greek mathematical sciences
b) The deployment of experiment both to control postulation and to explore by observation and measurement
c) Hypothetical construction of analogical models
d) Ordering of variety by comparison and taxonomy
e) Statistical analysis of regularities of populations, and the calculus of probabilities
f) The historical derivation of genetic development (1992, p. 4).

Crombie's contribution is perhaps the most comprehensive in the field of cognitive history. It provides a framework for identifying reasoning styles in other disciplines, through analysis of written material and immersion in a particular culture (see also, Kind & Osborne, 2017; Osborne, Rafanelli, & Kind, 2018). Many of the analyses applying to Crombie's model will also resonate within this project and as a result, discussion may occasionally turn to the concept of reasoning styles as imagined for science.

2.6.3   Styles beyond science

Bueno's generic definition of styles of reasoning cited above ("a pattern of inferential relations that are used to select, interpret, and support evidence for certain claims" (2012, p. 657)) illustrates the relevance to, but also beyond, science. Crombie's scientific styles support the argument that at least elements of reasoning are domain-specific (this is also supported by Toulmin in his framework of argumentation (2003)). For example, it would not be necessary, appropriate, or acceptable to employ experimental reasoning to support every form of conclusion in every academic discipline. Similar arguments can be made for Crombie's other styles. If each academic discipline adopts its own key styles of reasoning, drawing upon a range of different evidence-types considered valuable and appropriate, there is an important argument for identifying key styles of reasoning in each academic discipline. This is particularly important in educational terms. If students are to develop key reasoning skills necessary within domains, having a clear framework of these styles, and then explicitly addressing them in teaching should strengthen their reasoning capacities and support the process of learning to reason. This does not necessarily mean that students do not learn these reasoning skills currently. However, learning of reasoning practices occurs indirectly, rather than from teachers explicitly targeting and discussing domain-specific reasoning styles individually.

van Drie and van Boxtel (2008) constructed a framework for historical reasoning. They suggest that historical reasoning "emphasises the activity of students" and align their emphasis on activity and use of knowledge with sociocultural theories of learning which recognise the importance of "language and tools" (van Drie & van Boxtel, 2008, p. 88). van Drie and van Boxtel describe the need for a framework "that would enable us to analyse students' reasoning both in writing and speaking…that would allow us to describe progression in both reasoning and learning in history, as

well as to identify the effects of different learning tasks and learning tools" (2008, p. 87). These authors explicitly required a framework to be used in educational settings. They also recognise that:

> While the framework identifies analytically separable components, these do not refer to entities that occur clearly separated in reality…The relative importance of each of these components in historical reasoning will depend on the complexity and the level of the historical problem or question one wants to address, the information and means available, the product that is asked for, and the person's knowledge and experience (van Drie & van Boxtel, 2008, p. 90).

This is similar to the stance taken in the scientific conception of styles (Crombie, 1995; Hacking, 1992, 2012) and in this thesis. While the six styles identified in science are distinct, they may not always be drawn upon individually or exclusively. It should be remembered that while here particular styles are constructed to represent isolated elements of reasoning practices in English, a much more complex (and less artificial) fusion of styles is likely to occur when reasoning in real-life. By describing individual styles, researchers can analyse reasoning processes and activities according to these styles, which represent different ways of forming and justifying conclusions. This supports teaching and therefore supports development of the process of learning to reason.

Discussion will now consider the notion of reasoning styles in English before focusing on elements required to support the process of learning to reason.

2.6.4   Styles in English

Despite conducting systematic literature searches, there are no known research publications explicitly relating to reasoning styles in English which are based on Crombie's (1995) discipline-specific styles approach to reasoning. Nevertheless, other areas of research interest have been developed which focus on the subject area of English and which share some connections with the notion of reasoning styles. The *Protocol for Language Arts Teaching Observation* (PLATO), developed at Stanford University as part of the large-scale Measures of Effective Teaching (MET) Project (Cohen & Goldhaber, 2016; Cor, 2011; Grossman, Cohen & Brown, 2014; Kane & Staiger, 2012), was originally developed to explore the impact of teachers' classroom practices on student achievement (Grossman et al., 2014). Based on research into effective teaching in English, (across reading, writing and literature), thirteen elements of high quality teaching are organised into four categories:

"disciplinary and cognitive demand of classroom talk and activity; representations and use of content; instructional scaffolding; and classroom environment" (Grossman, Cohen & Brown, 2014, p. 306). This protocol has been used as an observation measurement tool to assess the quality of classroom instruction in English/Language Arts. The categories are broad reaching in terms of what is being observed and measured in PLATO. Indeed, some aspects, while undoubtedly important to classroom instruction, are too general to be used for the purposes of measuring and assessing reasoning practices. The PLATO elements most applicable to the present project are captured, to some extent, in the following: "intellectual challenge"; "strategy use and instruction"; and "classroom discourse". The "connections to prior knowledge" and "connections to personal and cultural experience" (Grossman, Cohen & Brown, 2014, p. 306) are also related to the goals of dialogue in the present project. Perhaps unsurprisingly, the *intellectual challenge* and *classroom discourse* elements are both captured under the *cognitive/disciplinary-demand* factor whereas *strategy use and instruction* is represented by the *instructional scaffolding* heading (Grossman, Cohen & Brown, 2014). *Intellectual challenge* is characterised by the provision of tasks requiring analysis, inference and/or idea generation. *Classroom discourse* relates to the opportunities for students to engage in extended discussions including a focus (from teachers) on elaboration and clarification. *Strategy use and instruction* involves teacher explanations of how students can implement learning strategies (Grossman et al., 2014). These factors link to targeted dialogue practices relevant in this project as well as to the importance placed upon scaffolding tasks. However, they do not foreground reasoning sufficiently. PLATO is targeted at the same disciplinary area (English), but offers a more general and wide-reaching lens through which to observe and measure classroom instruction. It is ultimately aimed at evaluating teacher practice, which differs to the focus in this project. Nevertheless, overlaps with the present project in terms of what is considered good practice and which elements are valued in PLATO (based on existing research) provide some reinforcement of the practices aspired towards in the present project. The focus on discipline-specific practices also draws clear parallels to the notion of discipline-specific reasoning styles (as well as to Shulman's conception of pedagogical content knowledge (PCK) briefly discussed in Section 2.7.3). Attention will now move to focus on the process of learning to reason.

2.7 The process of learning to reason

The previous sections have explored various definitions and theoretical perspectives on reasoning. Additional complementary theories have also been considered, particularly in relation to their focus on participation in discipline-specific practices. The next section will consider the process of learning to reason. Incorporating sociocultural tenets and in line with the concept of reasoning styles, ways in which discipline-specific reasoning can be fostered will be considered, accompanied by consideration of theory and research findings. The role of language and dialogue will be reflected upon first, before focusing on collaborative learning approaches as a way in which dialogue can be foregrounded. Discussion will then move to consider the role of the teacher in fostering such collaboration and dialogue, before addressing issues related to scaffolding and task design.

2.7.1 The role of language and dialogue

Language, communication and talk are central to sociocultural theory and to the development and practice of reasoning (Vygotsky, 1978; Wells, 1999; Wertsch, 1985, 1991). Wells describes language in terms of "a semiotic tool" (1999, p. 19) enabling connection with and participation in a particular culture. Vygotsky considered language to be both a cultural and a psychological tool, illustrating the reciprocity of the intermental and intramental planes, and others have indicated interpsychological thinking as a prerequisite for intrapsychological thinking (Vass & Littleton, 2010). It has been argued that language "has a central, integrated position in enabling human cognition to be both individual and social" (Mercer, 2013, p. 152). Frith and Singer refer to the creation of "common knowledge" (2008, p. 3876; Clark, 1996) as a result of joint action and it is suggested that the process for creating this common knowledge is interactive and discursive (Mercer, 2013), as demonstrated in educational research (Edwards & Mercer, 1987/2012). The human capacity to *interthink* (Littleton & Mercer, 2013; Mercer, 2000), where language and other tools are used to link the minds of individuals leading to *collective thinking* (Mercer, 2013), has often been explored separately to studies of individual thinking. Calls to unite the two areas of enquiry (individual thinking and thinking together) have been made (Mercer, 2013).

Research has illustrated that particular forms of structured talk are beneficial to learning and understanding (Cazden, 2001; Michaels, Sohmer & O'Connor, 2004; Sohmer, Michaels, O'Connor & Resnick, 2009). For example, some authors use the term *exploratory talk* to capture features of dialogue believed to be most productive to learning and understanding (Barnes, 1976, 2008; Mercer, 2013). Exploratory talk requires critical but constructive engagement with the ideas of other group members where ideas are considered jointly and are open to challenge and counterchallenge. Such challenges require justification and alternative suggestions to be made. Exploratory talk emphasises the active participation of all group members where each member contributes to the formation of joint decisions (Mercer & Littleton, 2007). This form of dialogue has been described as representing "a social mode of reasoning" (Mercer, 2013, p. 158). Other terms designed to capture productive forms of talk have also been used, such as *accountable talk* (Michaels, O'Connor, & Resnick, 2008) and *transactive dialogue* (Keefer, Zeitz & Resnick, 2000) although there is not room to consider these in detail here.

The EEF Teaching and Learning Toolkit suggests that collaborative approaches promoting talk and interaction between learners often see the greatest gains (2018; see Section 2.7.2). Despite this, research has illustrated the lack of talk within classrooms alongside a preference towards low-level tasks and questioning, which place limited cognitive demand on students (Edwards & Westgate, 1994; Howe & Abedin, 2013; Smith, Hardman, Wall, & Mroz, 2004). Mercer (2013) cites research which suggests the limited educational value of much of the group work happening in classrooms (Bennett & Cass, 1989; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009; Wegerif & Scrimshaw, 1997) pointing to the importance of carefully considering the way in which collaborative learning situations are planned and supported.

Embracing a dialogic model of education may strengthen the value of group work in the classroom. Dialogic teaching is widely advocated in research (Alexander, 2008; Littleton & Mercer, 2013; Michaels & O'Connor, 2013) although authors use a range of terms to refer to practices involved (Hennessy et al., 2016). The concept of dialogic teaching builds upon a rich history of consideration of the benefits and uses of language to learning. Dialogic approaches have developed following seminal works of key scholars (e.g. Burbules, 1993; Freire, 1972; Shor, 1992, 1996; Vella, 2000). Bruner, for example, argued for a "mutualist and dialectical" pedagogical approach where "understanding is fostered through discussion and collaboration" (1996, p. 57). Building upon Vygotskian principles (e.g. 1978), Wells describes the notion of *dialogic inquiry* as part of a

community of inquiry (1999). The pervasive importance of dialogue is also central to Bakhtin's (1986) perspective which lauds the process of talk in the construction of meaning and the importance of multiple 'voices' situated within a given context. Given the multiplicity of perspectives on sometimes conflating terms (such as dialogic and dialectical), it is perhaps not surprising that definitions are complex and used in different ways by different people (or paradigms). The difference in perspectives between key figures (such as Bakhtin and Vygotsky) and differences between notions such as dialogic and dialectical further complicate matters (Wegerif, 2008).

This thesis will consider definitions and principles offered by a seminal figure in dialogic teaching and learning research, particularly in relation to primary education, Robin Alexander. He proposes five principles which suggest that dialogic teaching is:

Collective: teachers and students address learning tasks together;

Reciprocal: teachers and students listen to one another, share ideas and consider alternative perspectives;

Supportive: students are free to express their ideas without fear of 'wrong' answers; they help each other to reach common understandings;

Cumulative: students and teachers build on one another's ideas forming coherent lines of thinking/enquiry;

Purposeful: teachers deliberately plan and facilitate dialogic teaching in relation to specific educational goals (Alexander, 2008, p. 38).

Benefits of adopting a dialogic approach should be considered. Thus, according to Alexander, dialogic teaching: promotes communication; develops relationships, confidence and a sense of self; develops individual and collective identities; develops spoken language and high-quality talk which scaffolds understanding; engages attention and motivation and leads to measurable learning gains; and supports citizenship goals through a focus on reasoning, debate and argumentation skills (2008). In dialogic approaches, the learner is required to actively participate in the development of their own learning. They are not passive 'consumers' of knowledge, but instead work with others to develop understanding in a reciprocal, cumulative manner, with the importance of articulating reasoning foregrounded (see e.g. Alexander, 2008; Vella, 2000). There is some empirical support for the use and value of dialogic approaches to student outcomes (Alexander, 2008; Mercer, 1995;

Rojas-Drummond, Mercer, & Dabrowski, 2001; Skidmore, 2006; Wells, 1999; Wells & Edwards, 2009) although more large-scale research is required in this area (Mercer, 2013; Reznitskaya & Gregory, 2013).

Principles of dialogic teaching and learning draw clear parallels to the aims of this project. Indeed, the notion of dialogic teaching may be considered as complementary to that of reasoning styles. Emphasis on collaboration, high-quality talk and particularly on reasoning imply the potential value of the theory of dialogic teaching as a lens through which to promote reasoning. Yet while the concept of dialogic teaching complements the aims of this project and will be returned to in the Discussion chapter, the main theoretical lens employed here is the concept of discipline-specific styles of reasoning. This permits the required focus on discipline-specific reasoning practices. While dialogic teaching aims to promote reasoning, this theory does not specify disciplinary differences in reasoning practices. It also foregrounds the importance of other practices, as indicated in Alexander's principles (2008), which go beyond the scope of this project. It might be helpful to consider the theory of dialogic teaching and learning as a broader lens, in that it focuses on general principles of dialogue (rather than reasoning specifically) and spans subject domains. Thus, theory related to dialogic teaching and learning is complementary to the ideas developed in this thesis, but not sufficient or necessary to the promotion of discipline-specific reasoning styles.

2.7.2   Collaborative Learning

In addition to the role of language and dialogue, collaborative learning may be important to the process of learning to reason. Small-group teaching has been varyingly defined, titled, and conceptualised. Davidson and Major (2014) synthesise three major approaches to implementing group work: *cooperative, collaborative and problem-based learning* (PBL) approaches. Cooperative learning is associated with figures such as Lewin (1946), and social psychologists like Johnson and Johnson (1975), Sharan (1990) and Schmuck and Schmuck (2001). Collaborative approaches originated within constructivism (e.g. Kelly, 1955; Rorty, 1979; Vygotsky, 1978) and were developed by Britton (1970) and Slavin (1989). Collaborative approaches can be considered as a rejection of structures and instead, as a "philosophy of interaction" (Ferguson-Patrick & Jolliffe, 2018, p. 2). PBL requires a problem which is used to drive student learning (Davidson & Major, 2014). There are

important distinctions between cooperative and collaborative approaches, based on their philosophical origins and development. While there is not space to consider differences between small group learning approaches in detail, it is worth briefly reporting some of the major distinctions. Thus, in fostering interdependence, cooperative approaches tend to use a combination of goals, tasks, resources, assigned group roles and rewards, while collaborative approaches typically focus on goals, tasks and, occasionally, resources (Davidson & Major, 2014). Collaborative approaches tend not to explicitly teach group interaction or reflection skills, while some cooperative approaches do. Moreover, cooperative approaches often divide the overall goal into sub-tasks to be completed by individual group members and then reassembled whereas in collaborative approaches, members typically address the task together (Ferguson-Patrick & Jolliffe, 2018). Despite differences, cooperative and collaborative learning approaches share similarities including: the use of a learning activity for group work; demand for small-group interaction focused on the activity; cooperative behaviour amongst students working together to accomplish a learning task; individual accountability and responsibility; and interdependence (Davidson & Major, 2014). Such similarities help to explain why the approaches have often been equated. For the purposes of this project, the term *collaborative learning* will be adopted. This aligns with the Education Endowment Foundation's (EEF) primary usage. It also acknowledges the shared group working practices which will be encouraged during the empirical phase of the project where all group members will address learning tasks together (there will be no explicit sub-tasks or assignment of group roles). Nevertheless, cited research and benefits may be taken from research on cooperative learning and may be shared by both approaches (Davidson & Major, 2014; Gillies, 2016).

The Education Endowment Foundation's (EEF) Teaching and Learning Toolkit (2018) summarises, reviews and synthesises international evidence (primarily in the form of systematic reviews or meta-analyses) concerning over forty different approaches designed to improve teaching and learning. The Toolkit defines *collaborative* (or *cooperative*) learning as "learning tasks or activities where students work together in a group small enough for everyone to participate on a collective task that has been clearly assigned" (2018, p. 2). While recognising the importance of the teacher's role, Blatchford, Kutnick, Baines and Galton suggest that the "defining characteristic" of group work "is that the balance of ownership and control of the work shifts toward the pupils themselves" (2003, p. 155). Indeed, Howe and Abedin's (2013) systematic review considering four decades of research into classroom dialogue cites studies which have observed the richness in student contributions when collaborating in small groups which is not found in traditional, teacher-fronted Initiation-Response-Follow up/Feedback (IRF) contexts (Bleicher, Tobin, & McRobbie, 2003; Danielewicz, Rogers, &

Noblit, 1996; Kim, Anderson, Nguyen-Jahiel, & Archodidou, 2007; McIntyre, Kyle, & Moore, 2006; Olitsky, 2007; Roychoudhury & Roth, 1996; Rymes, 2003) (see Section 2.7.3 for discussion of IRF).

For over a century, psychology has explored issues related to collaborative learning. Baldwin (1897), Piaget (1928, 1959) and Vygotsky (1978) each emphasised the importance of interaction between social, affective and cognitive states for learning (Blatchford et al., 2003). Such theories suggest that the process of working together leads to "sociocognitive conflict which stimulates reasoning" (Davidson & Major, 2014, p. 12). For Piaget, the role of interaction was to present the individual with new experiences or knowledge through interaction with others and the environment. This new knowledge extended and built upon children's existing schemas, through processes of *assimilation* and *accommodation*. Vygotsky saw a larger role for social interactions. For Vygotsky, knowledge is part of societies and the social interactions promoting knowledge development are societal, cultural practices. Vygotsky distinguishes between the *intermental* (interaction between the learner and others) and the *intramental* planes (the capacity to display an ability following a process of internalisation), with the intermental plane developing first. It is the gap between the two planes which is described as the *zone of proximal development* (ZPD): the gap between what a learner can do unaided and what they can achieve with support, collaboration, or *scaffolding* from a more knowledgeable other (Bruner, 1978; Vygotsky, 1978; Wells, 1999).

There is a wealth of research considering collaborative learning, peer learning and group work. Its benefits are widely recognised, including by the Toolkit (Education Endowment Foundation, 2018). The Toolkit recognises that collaborative (or cooperative) approaches to learning have a consistently positive impact with an estimated average of five months' attainment gain as a result of employing such approaches (based on analysis of ten meta-analyses, five of which were conducted in the last ten years). According to the Toolkit, benefits are enhanced when structured approaches to collaboration are adopted, with well-designed tasks employed. Section 2.7.5 will consider the importance of task design in more detail.

A major benefit of collaborative approaches is that of raised academic achievement (Borman et al., 2007; Capar & Tarim, 2015; Education Endowment Foundation, 2018; Gillies, 2003; Igel, 2010; Kyndt et al., 2013; Puzio & Colby, 2013; Romero, 2009; Roseth, Johnson, & Johnson, 2008; Slavin, 2010). Research has also identified benefits to student motivation (Gillies, 2003) and attitudes (Education

Endowment Foundation, 2018; Kyndt et al., 2013). Benefits have been observed in problem-solving situations (Barron, 2000; Schwartz, 1995) and in terms of improvements to peer relationships (Roseth et al., 2008). *Peer-assisted learning* (PAL) interventions, a form of collaborative learning, were investigated in Ginsburg-Block, Rohrbeck and Fantuzzo's (2006) meta-analysis. Although there was variation for low versus high income, urban versus suburban-rural, minority versus nonminority students and within the Grade bracket of students (1-3 versus 4-6), results indicated the benefits to social, self-concept and behavioural outcomes as a result of PAL. The Toolkit summarised some of the benefits of collaborative (or cooperative) learning approaches: "improved intergroup relations, acceptance of mainstreamed classmates, enhanced self-esteem, and positive attitudes" (Education Endowment Foundation, 2018, p. 2). Benefits have been found across all ages and across the curriculum with EEF rating the evidence as "extensive" (2018, p. 2). In addition, research has identified benefits to learners gained by working collaboratively in small groups compared to working individually (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Schwartz, 1995).

Despite the extensive evidence in support of collaborative approaches to teaching and learning and the recognised benefits of using such approaches, group work tends to be rare in UK classrooms and often of low quality (Blatchford et al., 2003; Comber, Galton, Hargreaves, Wall, & Pell, 1999; Galton, Simon, & Croll, 1980; Howe, 2017). Students are often seated *in* groups, but rarely work and interact *as* groups (Galton et al., 1980; Howe, 2017; Howe & Abedin, 2013). There are several contributing factors to the lack of high-quality group work. For teachers, there may be concerns about the negative behavioural implications of using collaborative approaches such as disruption, off-task behaviour and loss of control (Cohen & Intilli, 1981; Gillies & Boyle, 2010). Challenges in terms of planning, organising and resourcing group work, in line with curriculum demands and sustained over time (rather than as 'one-off' activities) are also recognised (Blatchford et al., 2003; Gillies & Boyle, 2010; Kohn, 1992). Research has suggested that there is often limited time and attention given to planning for effective group work (Blatchford et al., 2003; Galton & Williamson, 1992). In Gillies and Boyle's study (2010), perceptions from ten middle-year teachers who had implemented a cooperative learning approach were reflected upon. These teachers identified factors necessary for successful group work which require careful consideration and planning. These include group composition; the task(s) to be used; training for students to support development of social skills; and assessment of learning as a result of group work. The lack of training given to teachers to support the implementation of collaborative learning approaches and teachers' lack of understanding about how to use collaborative approaches have been identified (Blatchford et al., 2003; Gillies & Boyle,

2010). This raises concerns about the possibility of teachers being able to implement the conditions required for 'successful' group work.

Research has identified conditions required for successful group work (Howe & Mercer, 2007) with attempts to implement these (Dawes, Mercer, & Wegerif, 2003; Kutnick, Blatchford, Baines, & Tolmie, 2014). Despite problems associated with collaborative approaches to learning, there may have been progress in recent years in terms of implementing group work in English classrooms. Howe (2017) reports findings from the Cambridge Educational Dialogue Research (CEDiR) Group and in particular, the large-scale research project: A Tool for Analysing Dialogic Interactions in Classrooms. Recordings from 386 group work sessions from 72 Year 6 classrooms in England were rated on criteria believed to represent academically productive activity. Findings suggest that "group work…typically measures very well against research-driven standards" (Howe, 2017). While "considerable variation" in prevalence of productive forms of dialogue were identified in the data set (Vrikki, Wheatley, Howe, Hennessy & Mercer, 2018, p. 14), research from the CEDiR Group suggests that the situation may not be so bleak in terms of scarcity of productive group work in English primary schools. The following section will consider the role of the teacher in facilitating the process of learning to reason.

2.7.3   The role of the teacher

The previous two sections have considered the roles of language and dialogue and collaborative learning to the process of learning to reason. This section will consider another important aspect within this process: the role of the teacher. The classroom teacher's role has developed throughout the course of history. Following the second World War, the influence on educational practice of seminal figures like Piaget, Vygotsky, Dewey and Bruner cannot be underestimated. Despite proposing theoretically distinct arguments, these figures can be united in terms of their emphasis on the significance of student interaction. This departs from previous emphasis on development of the individual as a process happening within that individual. The theorists noted above maintained that interaction was important to individual development. This section will consider teacher-student dialogue and the role of the teacher in collaborative approaches to learning.

Research has considered the types of dialogue typical between teachers and students. The prevalence of questions posed by teachers has long been documented (e.g. Mercer, 1995). Sinclair and Coulthard (1975) described the Initiation-Response-Follow up/Feedback (IRF) exchange over forty years ago (see also Mehan, 1979). Sinclair and Coulthard's study characterised the three most typical exchanges between teacher and students according to three main talk moves. The *initiation* is provided by the teacher in the form of a question, elicitation or directive, a *response* is provided by the student, with *a follow up* from the teacher in the form of an evaluation or acceptance. This popular model has also been described as the Initiation-Response-Evaluation (IRE) sequence (Mehan, 1979) and termed the "triadic dialogue" (Lemke, 1990). Despite its predominance, other forms of interaction may also feature to varying degrees in different classrooms (Cazden, 2001). In addition, the three parts of the triad may also serve varying educational goals or actions (Waring, 2009) and lead to additional teaching and learning activities (Lee, 2007).

Mercer lists prevalent techniques used by teachers:

> *…to elicit knowledge from learners*
> Direct elicitations
> Cued elicitations
>
> *…to respond to what learners say*
> Confirmations
> Repetitions
> Elaborations
> Reformulations
>
> *…to describe significant aspects of shared experiences*
> 'We' statements
> Literal recaps
> Reconstructive recaps
>
> (1995, p. 34)

Mercer therefore highlights the prevalence of questions, recaps, elaborations and reformulations from teachers (see also, Joiner, Littleton, Faulkner, & Miell, 2000; Murphy, 2008; Rasku-Puttonen, Eteläpelto, Häkkinen, & Arvaja, 2002). He also notes the regularity of these throughout the world, in spite of differences in teaching styles and organisation of classrooms, citing literature to support this argument (Mercer, 2007).

There are many criticisms of the dominant use of the IRF/E sequence. These mainly focus on the 'transmission' model it presents, the unequal power relationships between teachers and students at play (Allwright & Bailey, 1991; Barnes, 1982; Lemke, 1990; Wood, 1992) and the minimal engagement it promotes from students. Despite these objections, others have recognised the potential of the sequence as educationally purposeful (Mercer, 2001). Regardless of criticism or praise, its prevalence has been highlighted in over forty years of research into educational dialogue (Howe & Abedin, 2013; Wells & Arauz, 2006).

While study of patterns of dialogue between teachers and students is an important area of investigation, the present study is primarily concerned with dialogue between students (see Section 2.7.1). Of course, the teacher's role in this is still an important one. Teachers are instrumental in creating an environment which promotes authentic collaboration. They are responsible for establishing student groups, modelling and advocating collaboration. The teacher's role in modelling is made clear in Webb, Nemer and Ing's paper (Webb, Nemer, & Ing, 2006). This study found a strong link between the types of interaction demonstrated by teachers (in this instance, mainly continuing a style of recitation and procedural instruction) and that which was demonstrated by students in collaborative group settings. This is reinforced by empirical research. The Thinking Together intervention studies have included in excess of 700 children aged between 6 and 14 (Mercer, 2013; Mercer & Littleton, 2007). This programme requires class agreement on ground rules for group talk and requires whole-class teacher modelling of exploratory talk (see Section 2.7.1). Teachers explicitly consider the use of language for reasoning which researchers hope supports the development of their meta-awareness (Dawes, 2012; Mercer, 2013). One of the Thinking Together studies involving children aged 9 and 10 found that those students who had participated in the Thinking Together intervention not only gained higher scores in science and mathematics National Curriculum-based tests but also became significantly better at reasoning (assessed using the Raven's Progressive Matrices test). Crucially, these improvements to reasoning applied both when students worked collectively and when they worked alone (Mercer, Dawes, Wegerif, & Sams, 2004; see also Rojas-Drummond & Mercer, 2003, for replicated findings in Mexican schools). These findings suggest the benefits to individuals of working collaboratively.

Benefits are also identified in a study including students aged between 10 and 11 from three classes who were engaged in teacher-led collaborative reasoning discussions about literary texts for a period of five weeks (Reznitskaya et al., 2001). (This has clear parallels to the research conducted in

this thesis). Reznitskaya et al. (2001) found that the children from collaborative reasoning classes wrote persuasive essays containing a greater number of arguments, counter-arguments, rebuttals, formal argument devices and references to direct text than students from three comparable classrooms who had not participated in the collaborative reasoning discussion method. This study suggests that the experience of participating in collaborative reasoning also supported the development of individual reasoning skills. It has therefore been suggested that, partially through appropriate modelling, teachers can scaffold students' intramental development; in other words, teachers can support student internalisation of learning which happens socially (intermentally) (Mercer, 2013). (See Sections 2.1 and 2.2.2 for discussion of internalisation).

Some researchers have provided frameworks to support teachers in their efforts to foster collaboration. For example, Engle and Conant (2002) outline four principles for teachers employing collaborative groupings within their classroom to foster productive disciplinary engagement. They argue that teachers should design learning environments that support:

> (a) problematising subject matter,
>
> (b) giving students authority to address such problems,
>
> (c) holding students accountable to others and to shared disciplinary norms, and
>
> (d) providing students with relevant resources
>
> (Engle & Conant, 2002, p. 399).

Providing students with opportunities to actively engage in problems or tasks independent of the teacher but as part of a student group may be a useful way of engaging students in activity considered valuable within a discipline. Increasing their opportunities to work within disciplinary norms, or epistemes, may support their development and engagement with such disciplines. This is reinforced by Engle and Conant's focus on "what constitutes productive discourse in a content domain" (2002, p. 400). Emphasis on developing reasoning in Engle and Conant's framework, particularly through a focus on holding students accountable in principle B (to one another but also to disciplinary expectations), may provide useful guidance in the context of a project designed to promote and stimulate student reasoning in a specific discipline (primary English).

Shulman (1986) coined the term pedagogical content knowledge (PCK) and in doing so, emphasised the importance of teacher professional knowledge both about subject matter and of pedagogical

issues important to the teaching of particular topics. PCK considers learners' responses (and strategies for how to deal with barriers to learning) as well as ways in which learning or topics can be made accessible through representations (such as analogies, examples, explanations) (Hashweh, 2013; Shulman, 1986). Emphasis on pedagogical issues specific to disciplines within PCK links to arguments considering discipline-specific reasoning developed in this project.

2.7.4   Scaffolding

Wood, Bruner and Ross (1976) coined the term *scaffolding* to describe the process of children, supported by a more knowledgeable other, performing more complex tasks than they would be able to complete alone (Reiser & Tabak, 2014). This concept is based on a metaphor linked to building construction, with scaffolding permitting builders (or learners) to access the resources they require in the construction of the building (or a learner's understanding). Rather than holding a building up, scaffolding permits construction which would not be possible without the structure and access the scaffold provides for the materials needed for building.

The blurred and far-reaching nature of the scaffolding concept has been criticised and it has been suggested that the term has become equated with general teacher support (Pea, 2004; Puntambekar & Hübscher, 2005; Stone, 1998b, 1998a). Yet the value of retaining the scaffolding metaphor has also been argued (Stone, 1998b, 1998a). Van de Pol, Voman and Beishuizen (2010) respond to criticisms about the rigidity and pre-defined nature of the 'building' implied by the scaffolding metaphor (Aukerman, 2007; Butler, 1998; Donahue & Lopez-Reyna, 1998; Scruggs & Mastropieri, 1998). In their review of a decade of research into scaffolding, they suggest that it is "viewed…as an interactive process that occurs between teacher and student who must both participate actively in the process" (Van De Pol, Volman, & Beishuizen, 2010, p. 274).

Scaffolding in the learning process relates to Vygotsky's (1978) *zone of proximal development* (ZPD), which describes the gap between what a learner can do (or problem-solve) independently and what they can do with the support of a more knowledgeable other. Scaffolding supports performance on tasks more complex than would be achievable without support but also enables children to learn from this experience (Reiser & Tabak, 2014).

The teacher's role in scaffolding is made clear in theories of learning and development (Bruner, 1978; Vygotsky, 1978; Wood, Bruner, & Ross, 1976) and is supported in empirical research (Mercer, 2013; Mercer & Littleton, 2007; Webb et al., 2006). Scaffolding sees a teacher, or more experienced peer, supporting a child in their learning through a variety of mechanisms. For example, scaffolding may be provided through modelling (or use of models), questioning, use of software environments, or task design. Reiser and Tabak discuss the role of teachers' verbal and written prompts and suggest that these verbal prompts represent "conceptual guiding questions taking over the monitoring and regulation aspects of the task, so that learners can focus on building their proficiency in answering the questions" (2014, p. 45). Prompts therefore scaffold learning and permit investigation and analysis which would not otherwise have been possible.

While the role of scaffolding in the form of verbal prompts from teachers/adults/more experienced others is acknowledged in this project (see e.g. Sections 2.7.4 and 6.3.1), there is also a focus on scaffolding provided by task structures. The relevant skill sets required to address some learning problems may be incomplete for some children. It is therefore argued that "what learners need to acquire through the scaffolded activity is an inventory of relevant actions and proficiency in the orchestration of these actions" (Reiser & Tabak, 2014, p. 46; Wertsch, 1979). Rather than present learners with small sub-tasks to complete (as in behaviourist approaches to learning), scaffolding represents a contextualised approach, with learning embedded in complex tasks and appropriate guidance and support offered. The built-in requirements of task structures can scaffold the actions required to develop proficiency in disciplinary-skills or practices. It is argued that the contextualised nature of scaffolding tasks supports transfer and facilitates understanding of a discipline and its objectives (Resier & Tabak, 2014). Development of disciplinary-based understanding and practices are central ideas in this thesis.

Briefly, scaffolding tasks in this thesis draw upon the construction metaphor and relate to the supportive structures built into specific task designs which enable students to participate in disciplinary-practices and solve problems otherwise beyond their capabilities. The task structures require explicit decision-making and justification of reasoning with individual task demands and procedures scaffolding these disciplinary practices. Thus, in combination with scaffolding provided by adult prompting, questioning, modelling and so on, the task designs also act as scaffolds. Reiser

and Tabak (2014) identify features and benefits of scaffolding. One has particular relevance to this project: "scaffolding can prompt learners to explain and reflect" (Reiser & Tabak, 2014, p. 49). Articulating reasoning is of paramount importance in this project. The task structures used foreground requirements to explain and reflect. This is partially due to the in-built structures of the tasks themselves which require decision-making and because of their focus on collaboration which prompts explanation of these decisions. Discussion of task structures used in the empirical phase of this project is offered in Section 4.13. The following section will present literature related to task design, particularly when used collaboratively.

2.7.5   Task Design

The sections above consider the role of the teacher within the process of learning to reason and highlight the importance of the learning tasks used to collaboration and to the promotion of dialogue. Teachers play a vital role in designing appropriate tasks and teaching sequences to encourage collaboration which foregrounds the development of student reasoning. Wood, Ross and Bruner (1976) indicate the importance of scaffolding from teachers to ensure that tasks are within students' capabilities (see also Blatchford et al., 2003). Despite recognition of this importance, research has suggested that teachers often have difficulty in selecting and designing appropriate tasks, with the intention of promoting collaborative work and dialogue (Bennett & Dunne, 1992; Blatchford et al., 2003; Harwood, 1995).

Several authors propose conditions under which collaborative work can be promoted through a focus on task design. Leat and Higgins (2002) explicitly consider the role of *powerful pedagogical strategies* (PPS). They define PPS as teaching strategies which:

- represent a manageable unit of change (i.e. can be used in single lessons);
- are flexible and adaptable across subjects and age groups; are open-ended and without a single 'correct' solution (thus promoting a variety of working methods and reasoning);
- support reconfiguration of the role of subject knowledge by juxtaposing what is known with what is new so that subject knowledge becomes the stimulus to reasoning;
- encourage talk (the ambiguity provided by tasks requires interpretation, clarification, connecting, hypothesising and evaluating which are the kinds of talk

> valuable for their role in supporting students to construct understanding jointly);
> and
> - support metacognitive awareness by requiring cognitive and social processes which
>   can then be talked about in class (Leat & Higgins, 2002, pp. 74–77).

Leat and Higgins' paper draws upon a long-term project at Newcastle University where academic staff gathered and generated flexible and creative strategies intended to increase the level of challenge in lessons. These strategies were supportive of demands to change traditional forms of classroom interaction and formed the basis of a 'Teaching Thinking' course available to all PGCE students at Newcastle University (Leat & Higgins, 2002). The task structures themselves are discussed at length in *Thinking Through Primary Teaching* (Higgins, 2001) and some are adopted in this study (see Section 4.13 for full discussion of task structures used).

Lotan also considers the requirements for tasks to be used collaboratively. In *Crafting Groupworthy Learning Tasks*, she suggests that *groupworthy tasks* should:

- be open-ended, requiring complex problem-solving;
- provide students with opportunities to use multiple intellectual abilities and to demonstrate intellectual competence;
- address discipline-based, intellectually important content;
- require positive interdependence and individual accountability; and
- include clear criteria for the evaluation of the group's product and of the individual report (Lotan, 2014, p. 85).

The importance of using open-ended, ill-structured tasks is emphasised by authors discussed above (see also Cohen, 1994). The demands placed on students include requirements to articulate, describe, clarify, elaborate and reason about opinions, ideas and beliefs; to analyse, synthesise and evaluate; and to work towards drawing conclusions and achieving consensus (Higgins, 2001; Leat & Higgins, 2002; Lotan, 2014). Lotan argues that though using open-ended, ill-structured tasks, teachers "delegate *intellectual authority* to their students" (2014, p. 86). Students are therefore empowered to consider their own viewpoints as representing "legitimate components of the content to be learned" (Lotan, 1997, 2014, p. 86).

Further areas of investigation applicable when considering task design include Kagan's *structures,* designed to promote cooperative learning (Kagan, 1989). Davidson and Major discuss the structural

approach to cooperative learning "based on the creation, analysis, and systematic application of structures, or content-free ways of organizing social interaction in the classroom" (2014, p. 13). They discuss the typically sequential nature of these structures, with different steps prompting different behaviours or actions and organising patterns of communication within the group. As implied in Leat and Higgins' (2002) *PPS* and Lotan's (2014) *groupworthy* tasks, structures are distinguished from activities, the latter of which combine open-ended, broadly applicable and adaptable structures with specific academic content. This also relates to work on thinking routines (Ritchhart, Church, & Morrison, 2011; Ritchhart, Palmer, Church, & Tishman, 2006; Ritchhart & Perkins, 2008; Salmon, 2010). Ritchhart, Church and Morrison conceptualise thinking routines in three ways: as tools, as structures and as patterns of behaviour (2011). It is argued that teachers who successfully promote students' thinking tend to scaffold and support this thinking by developing, adapting and using specific routines (Ritchhart, 2002) (see Section 6.2.1).

2.8   Conclusion

This Literature Review has presented a selection of theoretical perspectives and empirical findings which, to varying extents, complement the aims of this project. Consideration of definitions of reasoning across paradigms and theoretical perspectives helped to consider perspectives on reasoning more broadly. A focus on sociocultural theory and the concept of reasoning styles demonstrated some of the main principles believed to be valuable to supporting the process of learning to reason in primary English. The roles played by dialogue, collaborative approaches, task design and the teacher demonstrate some of the main considerations to make when attempting to foster and promote reasoning development. All these considerations have helped with methodological decisions about the most appropriate approaches to take in order to address the project's main RQs.

The next section will focus on the conceptual enquiry phase of the project which addresses RQ 1 (What styles of reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?) The methods used to answer the question will be discussed before presenting the main findings in the form of a theoretical framework of reasoning styles for primary English. This framework outlines discipline-specific reasoning practices for primary

English and forms the basis of the empirical phase of the project which addresses RQ 2 (Can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?)

3 Study One: A Conceptual Enquiry

RQ 1 asks: *what styles of reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?* The question therefore seeks to explore the discipline-specific reasoning practices exhibited in the English literature discipline and important within primary English. This chapter will discuss the methodology used to address this question and will present the resulting framework of reasoning styles which represent Study One's main findings. This theoretical framework will then form the basis of the empirical phase of the project which addresses RQ 2.

3.1 Methods

This project seeks to identify styles of reasoning important in teaching English in primary schools. This section will discuss the methods used to address the first RQ. Briefly, since primary English draws upon the academic discipline and culture of English literature, this project builds on the cognitive history tradition to seek key styles of reasoning in an academic context. This is aligned with sociocultural theory (Section 2.2.2). Sociocultural theory emphasises the importance of shared thinking, communicating, reasoning and other social practices (Mercer, 2007, 2013). This theory therefore prompts study of reasoning within a culture, rather than reasoning within individuals (Fodor, 1983; Berger & Luckman, 1966, 1991; Fuller, 2002). Methodological decisions throughout Study One and Study Two are guided by sociocultural principles. This is discussed in relation to Study Two in Section 4.1. Given the pragmatic focus of the project, which seeks to outline reasoning styles important within primary English, efforts to ensure that these styles are also applicable to and appropriate for primary English will be detailed.

This study is exploratory. A framework of reasoning styles for English literature or the school subject of English does not (as far as I am aware) already exist in published research literature. From the outset, the project intended to contain an empirical element to investigate the utility of a theoretical framework of reasoning styles for supporting the process of learning to reason in primary English. However, the empirical phase was not possible before creating a version of the framework which

describes the styles. The methods to create the framework were considered to represent the best possible way of pragmatically achieving the project's intentions. These methods will be detailed below.

Thematic analysis has been defined as "a method for identifying, analysing, organizing, describing, and reporting themes found within a data set" (Nowell, Norris, White, & Moules, 2017, p. 2; Braun & Clarke, 2006). This project adopted a thematic analysis approach when creating the framework of reasoning styles. The first step in creating the initial framework was to consider an existing framework of reasoning styles created for another domain (science) and apply it to the subject of interest in this study (English). Themes established as important within science were therefore considered in relation to English. The evolution of styles of reasoning as a concept was considered, taking existing developments in this endeavour as a starting point. The second stage in creating the framework of reasoning styles was to explore products from the academic culture of English literature, to observe the styles of reasoning proficient academics engage in. Themes, tropes and techniques used in literary critique were therefore analysed. Consideration was also given to how reasoning in literary critique corresponds to styles of reasoning in science, particularly in terms of the implicit argumentation techniques and structures adopted (such as classification, for instance). When mapping potential styles from science to English and when engaging with academic texts, it is important to acknowledge that there was an informal process of filtering by me as the researcher for what is likely to be relevant to the primary curriculum running alongside the more formal stages of analysis, based on my knowledge and experience as a primary teacher. This was strengthened and explored formally during the third stage of creating the framework. The third stage explicitly engaged with the pragmatic focus of this project and the importance of ensuring that identified reasoning styles are relevant and applicable to the primary (or at least compulsory) education stage. The three broad stages involved during creation of the framework of reasoning styles for primary English will now be considered in more depth.

As a starting point, styles of reasoning already identified in science were considered in parallel to the domain of English literature. This approach built upon the extensive research into reasoning styles conducted by Crombie (1995) and others (such as Hacking, 1992). These researchers developed the concept of discipline-specific reasoning styles and were particularly concerned with identifying differences in reasoning. Although this research centred on the domain of science, the reasoning styles concept is used as a key lens through which to explore reasoning in English in this project and

it is therefore important to engage with previous developments in this area of research. Moreover, underlying reasoning and argumentation structures identified in science may have some importance in other domains. Using an existing framework therefore represented a potentially useful first step for identifying reasoning styles in English. Nevertheless, it is important to emphasise that any potential styles would be tentative and subject to reinforcement from consideration of both English literature and primary English domains. Crombie's (1995) framework of scientific styles of reasoning was thus considered by analogy to the domain of English literature and particularly in relation to the theory of literary critique. Crombie's six styles are, as summarised by Hacking:

a) The simple method of postulation exemplified by the Greek mathematical sciences
b) The deployment of experiment both to control postulation and to explore by observation and measurement
c) Hypothetical construction of analogical models
d) Ordering of variety by comparison and taxonomy
e) Statistical analysis of regularities of populations, and the calculus of probabilities
f) The historical derivation of genetic development (1992, p. 4).

Some of these reasoning styles are mainly applicable to the scientific domain, or at least domains more substantively like the sciences and mathematics (use of experiment in style B and probability in style E for instance). However, some parallels between science and English literature were identified which helped to expose underlying modes of argumentation and reasoning shared by both domains.

Thus, style D (ordering of variety by comparison and taxonomy) draws upon classificatory thinking and reasoning. In science, this style is used to establish what 'exists', developing concepts and a common language with which to reason about entities (Kind & Osborne, 2017). The focus on classification in scientific reasoning links to the use of genre to classify and order in English literature. While taxonomic reasoning in science looks different to its parallel in English, the underlying classificatory focus of this style of reasoning has helped to develop conceptual understanding within the literature domain and a common language with which to reason about categories identified. Using Crombie's styles of reasoning in science by analogy to English therefore helped to identify the genre-based style of reasoning.

Crombie's style C (hypothetical construction of analogical models) also helped in the early development of the analogy-based style of reasoning identified as important for English in this project. Analogical models are used in science to represent things too large to imagine (e.g. the solar system) or too small to see (e.g. the cell). These explanatory models represent what scientists have observed and provide the tools required to reason about how the world might behave (Kind & Osborne, 2017). Drawing parallels and the use of representation to support reasoning and interpretation is not a mode of thinking or argumentation restricted to the sciences. Indeed, although in a very different guise when used in English literature, this study identifies the use of analogy as an important style of reasoning in English. While not used in English to reason about how the world might behave (as in the scientific use of this style), use of analogy can support readers to reason about how fictional worlds might operate. This is explored further in the framework of reasoning styles presented at the end of this chapter but nevertheless explicates the initial stage of considering reasoning styles in science and English by analogy.

Although not linked to reasoning in English as explicitly as in the case of the two styles discussed above, other scientific styles of reasoning also contributed to early ideas about potential styles of reasoning for English. Thus, the focus on history and evolution in Crombie's style F generated a focus in this project on historical context (important to consideration of individual texts, writers and genres) and more broadly on the development and evolution of the domain of English literature (and its genres). Thus, while not representing a direct parallel in reasoning styles across the two domains, considering an existing framework of reasoning styles for science did help to illuminate potential styles for English.

Moreover, Crombie's style A (mathematical deduction) focuses on the use of mathematics (numerical quantities or algebraic symbols) to represent the world and to support deductive argument (Kind & Osborne, 2017). Mathematics therefore becomes a language used in science to make predictions and to reason. This can also be translated into a reasoning style important for English. Language more broadly is a symbolic system used to represent the world. Its signs and symbols are used to both encode and decode meaning. Thus, in the same way that mathematics represents phenomena using symbols and a common language, English literature draws upon the linguistic systems developed over millennia and resulting in a system of language to support communication and meaning making. A focus on the signs and symbols of this language system is a key concern in linguistics and is also important in English literature. Analysis of language and

linguistic devices adopted by authors represents a key concern for scholars in the domain and supports the process of interpretation. Consideration of another of Crombie's reasoning styles therefore pointed to the importance of a focus on systems of codes and symbols which can be drawn upon when reasoning.

Mapping scientific styles of reasoning to potential equivalent styles for English literature represented an initial stage in the development of a theoretical framework of reasoning styles for English. Table 3.1 was created to chart these mappings and early ideas. Scientific elements without clear parallels in English were filled in grey with partial mapping notes added.

Table 3.1 Mapping scientific styles of reasoning to potential styles for English

Reasoning Styles in Science	Potential Reasoning Style in English
The simple method of postulation exemplified by the Greek mathematical sciences	Language/ linguistics
The deployment of experiment both to control postulation and to explore by observation and measurement	*Partial mapping: use of evidence in English (linked to focus on observation and focus on rigour in scientific style). No emphasis on manipulation in English.*
Hypothetical construction of analogical models	Analogy
Ordering of variety by comparison and taxonomy	Genre
Statistical analysis of regularities of populations, and the calculus of probabilities	*Partial mapping: link between probability and deliberate use of ambiguity/playing with language in English which sets up interpretation. Not quantitative in English.*
The historical derivation of genetic development (1992, p. 4).	Historical context (important to consideration of individual texts, writers and genres). Development and evolution of domain of English literature and genre.

The next stage in creating a theoretical framework of reasoning styles for English focused on analysis of themes and techniques used in literary critique when reasoning about texts and justifying inferences. Consideration was made about whether the initial framework of reasoning styles created

by considering scientific styles by analogy to English literature was supported by what was observed in the discipline. This stage will now be detailed.

3.1.1   Exploring the academic culture of English literature

To identify potential styles of reasoning in English Literature, it was necessary to look to this academic culture and to products of this culture for support. Since, according to cognitive history, reasoning exists in cultural products, like academic texts, lectures and debates, these products had to be explicitly considered before a framework of styles could be constructed. While this project seeks to explore reasoning styles appropriate for primary English, by engaging with key ways of interpreting and forming conclusions at a lower stage of development, students are given opportunities to develop increasingly specialised skills and practices. This also complements OFSTED's increasing focus on curriculum development which privileges deep knowledge and understanding of the various subject disciplines (see e.g. OFSTED, 2018).

A couple of points must be made about the process of considering academic literature. Firstly, in this project, discussion and examples of discipline-specific reasoning styles primarily relate to the reasoning which happens when analysing and critiquing a literary text created by another (in other words, during the process of deconstruction). Yet it is important to acknowledge that these reasoning styles are also drawn upon by authors during the process of writing and creating their own texts (as part of production/construction). This difference in focus has not been ignored in the analysis of academic literature. Rather, given the difficulties of accessing information about the processes driving authors in their creation of texts (such as their consideration of genre, or language and so forth), the focus remained on analysing examples of reasoning from those interpreting texts. It was also necessary to restrict focus to mainly consider reasoning as readers of English literature rather than as writers. Nevertheless, within descriptions of reasoning styles identified in Study One, there is some consideration given to how this reasoning resonates when it is employed by a writer. For example, there is some discussion about an author's deliberate use of analogy within the analogy-based style. This consideration is particularly important in the section which considers where individual styles feature in the National Curriculum. There is sometimes discussion within each style of the writing composition requirements at primary level. These requirements imply a demand for the separate styles of reasoning during the process of writing and creating texts, and not

just when analysing and interpreting those of others. While this project primarily focuses on discipline-specific reasoning as part of deconstruction processes (within reading), further research might explore the potential of using the concept of domain-specific reasoning styles to support the production element of English (writing).

Focus is further bound by considering predominantly fictional texts in relation to identified styles, rather than non-fictional. Examples of analysis within the academic literature focusing on fiction are more plentiful than those which focus on non-fiction. Restricting focus also mitigates arguments concerning definitions of literature and literary texts, where fictional works already established as 'literary' (and their associated criticism) are readily accessible compared to the more blurred distinctions within examples of non-fiction. While it was necessary to limit focus in several ways in this project, the boundaries identified above demonstrate potential avenues for future research. Reasoning styles might therefore be considered more explicitly in relation to the writing element of English and might also consider non-fiction and potential implications to the framework of reasonings styles when engaging with non-fiction texts to a greater extent.

When creating the framework of reasoning styles and accessing products from the domain of English literature, it was necessary to read widely from a range of sources within the academic literature. I read from English literature-specific journals and books and aimed to consider a diverse array of sources in terms of content and literature of focus. Thus, I considered fictional literature which spanned a broad range of genres (in terms of structural text types such as novels, poetry and drama, and also in terms of genres based upon content or historical/societal constructions, such as tragedy, comedy, the gothic tradition). I also considered texts written about literature from major historical time periods as well as considering papers written at different time periods, regardless of when the literary text itself was produced. This was to establish whether reasoning within English literature has adapted or evolved over time and whether reasoning skills differed depending upon the period the literature was from. In addition to these considerations, I ensured academic texts from a range of higher education institutions were considered from within and outside of the UK. Although the academic discipline discussed is English literature, some criticism and evaluation has come from much further afield. In addition to consideration of formal written texts from the discipline of English literature, I also attended lectures given by academics in this field to consider whether any identified styles are also evident in verbal contexts.

The process of accessing materials from English literature could not be exhaustive, because of the limited nature of the study. While efforts were made to ensure breadth in materials accessed and considered when identifying reasoning styles, it was not possible to do this in a fully systematic manner. Nevertheless, it was ensured that a range of source types were included in analysis. Thus, articles from key peer-reviewed journals from English literature were accessed (e.g. *ELH, PMLA, English, Journal of Narrative Theory, Children's Literature in Education, Western Humanities Review*). In addition, monographs and edited collections were analysed. These were sometimes specific to a particular genre, author or text (e.g. Hoeveler & Morse, 2016; Roudane, 1987; Weller, 2012) or more broadly concerned with an issue in literature (e.g. Caserio & Hawes, 2012). Other sources included theses (e.g. Hyer, 1998) and philosophical writings (e.g. Engels, 1968). These usually related to texts, movements, genres or authors and were typically used to supplement exploration made by other scholars in literature. Figures associated with key movements in literary theory and critique were also considered, as these represent shifts or variations in the ways in which literature has been (or can be) interpreted (e.g. Cleanth Brooks and New Criticism). In addition to predominantly academic sources from English literature, texts aimed towards supporting students in their understanding of literature or literary analysis were also used. These sources represent an accessible form of literary analysis. Given that this project intended to identify reasoning styles important within the compulsory education stage, it was hoped that using such sources would help to illuminate how reasoning can be made simpler or more accessible, or even simply provide examples of how this might manifest at an earlier stage of accomplishment. It is therefore interesting that many of the examples of academic engagement with reasoning styles provided in the framework (Section 3.2) are from texts and/or authors commonly studied in Key Stages 3 and 4 (e.g. the Brontës, Dickens, Shakespeare, Arthur Miller, Carol Ann Duffy).

The previous section has described the creation of Table 3.1, where scientific styles of reasoning were mapped onto the domain of English literature. When accessing materials from English literature (as described in the previous paragraph), this table was added to in several ways, again, broadly using the method of thematic analysis. Additional columns were added alongside each potential style to provide examples of this style of reasoning taken from academic sources. If examples could not be identified despite lengthy and rigorous analysis of materials, this might indicate a lack of importance or predominance of a style of reasoning. Conversely, if abundant examples could be identified, this might bolster support for the prevalence of some styles. This

process helped to clarify early versions of the styles and helped to examine boundaries making the styles distinctive. Additional rows were also added if a further potential style of reasoning was identified (with examples accompanying a preliminary title/description) (see Table 3.2). This process helped to refine the framework of reasoning styles developing in Study One.

Table 3.2 Creation of framework of reasoning styles mapping scientific styles to potential styles for English and with reference to academic literature

Reasoning Styles in Science	Potential Reasoning Style in English	Examples from Academic Literature
The simple method of postulation exemplified by the Greek mathematical sciences	Language/ linguistics	Cleanth Brooks (a key figure in the new criticism movement): "There is surely a sense in which anyone must agree that a poem has a life of its own, and a sense in which it provides in itself the only criterion by which what it says can be judged" (1992, p. 12). Brooks [on Marvell's Horatian Ode]: "This complexity [of attitude towards Cromwell] is reflected in the ambiguity of the compliments paid to him. The ambiguity reveals itself as early as the second word of the poem. It is the "forward" youth whose attention the speaker directs to the example of Cromwell. "Forward" may mean no more than "high-spirited", "ardent", "properly ambitious"; but the New English Dictionary sanctions the possibility that there lurks in the word the sense of "presumptuous", "pushing"…" (1992, p. 16). Underwood' [analysis of the letters of poet and novelist Philip Larkin]: "In this essay…I apply a text-centred (rather than author-centred) approach to Larkin's lifelong correspondence with Monica Jones. An author-centred approach privileges the biographical value of a correspondence. The text-centred approach primarily rejects biographicalism, instead recognizing the identity of a letter-writer as constituted by the act of writing itself. In doing so, more attention is paid to the *literary* qualities of a correspondence, including the ways in which citation and intertextuality – so subtle yet extensive in Larkin's correspondences – affect the identity projected and our interpretation of it (Underwood, 2016, p. 41)". "Apologizing for keeping Jones apart from his friends, he confesses it was because 'I acted a different part with them from my behaviour with you, and since I couldn't do both at once it was well not to try' – the theatrical language pointing to the very idea of a performed selfhood which I am describing (3 May 1955)" (Underwood, 2016, p. 45). Whitley [on Carol Ann Duffy's poetry]: "The closing metaphor of 'an absolute scream' [in the poem 'Little Ghost') wittily deploys a clichéd phrase denoting hilarious performance to release a buried literal meaning; the 'scream' as response to horror or excitement in its fullest or purest form. This pun encapsulates a quality central to the whole performance of the poem: a fluidity of tone and

		movement between jokiness and evocative feeling whose range is exceptionally wide. The suggested provenance for this ghost child within film, moreover, relates the funny, sad horror of the poem explicitly to children's experience of this popular medium. Even the accompanying colloquial phrases are drawn from children's stock responses to contemporary examples of the horror genre they enjoy. 'Scary. Spooky. Totally freaky', the little ghost intones earlier in the poem, both sharing and provoking the child reader's response in a mode that involves not a little self-reflexive irony" (2007, p. 108). "…Full rhyme invoked repeatedly, as here, in short lines that have a loose affinity with ballad metre, is more likely to have a partial distancing effect. And this effect is enhanced by the self-consciously dramatic use of alliteration ('dancing deep' and so on)" (Whitley, 2007, p. 109).
The deployment of experiment both to control postulation and to explore by observation and measurement	*Partial mapping: use of evidence in English (linked to focus on observation and focus on rigour in scientific style). No emphasis on manipulation in English.*	
Hypothetical construction of analogical models	Analogy	**Analogies to other sources** Analogy-based reasoning *within* a text: author's explicit use of analogy within their own literary text(s) Dickens' choice of character names.

| | | Tambling: "many [names] are brilliant inventions, which suggest through onomatopoeia, connotation or symbol the traits and function of the personage in question: Bounderby, Crisparkle, Nandy, Pumblechook and Scrooge" (2013, p. 4).

Hyer [on analogues and imagery associated with textiles in old English literature]: "the extremely common visual analogue of weaving…was probably an attractive motif in a world of harsh nature and war because of its imposition of order on nature" (1998, p. 220).

Analogy-based reasoning *from* a text: drawing analogies as a critic when interpreting a text

When considering Mr Dorrit's ending, "ladies and gentlemen, God bless you all!", in Dickens' *Little Dorrit* (1997, orginal work published 1857), Tambling suggests "it is not difficult to hear Ophelia's 'come, my coach! Good night, ladies, good night' (Hamlet)" (Tambling, 2014).

Analogies within single texts

Themes or characters in opposition: good versus evil, light and dark, man and nature, individual and society, childhood and adulthood, war and peace, innocence and experience, tradition and innovation, truth and lies.

E.g. Levi-Strauss (structuralist movement in literary theory)-opposing binary pairs; Derrida and deconstruction (one element in these pairs considered positive, another element negative).

Bowers: 'Hamlet as Minister and Scourge' (1955). Explores Shakespeare's Hamlet's (2016, original publication 1603) movement along continuum from good to evil.
Blake's Songs of Innocence and Experience (2008, original publication 1789). 'Innocence' section mainly referencing childhood and including poems such as 'The Lamb', 'The Chimney Sweeper' and 'Infant Joy'. The 'experience' section contrasts the childhood innocence explored in the first half with poems such as 'The Tyger', 'The Fly' and 'Infant Sorrow'. Titles are deliberately contrasted in the two sections ('Infant Joy' versus 'Infant Sorrow'). |

Ordering of variety by comparison and taxonomy	Genre	Hoeveler and Morse identify *Jane Eyre* and *Wuthering Heights* as part of the gothic genre: "the gothic aesthetic and its genre conventions pervaded the writings of the Brontë sisters from their very earliest readings and writings as adolescents to their last pieces of fiction" (2016, p. 31).
		Yet Homans argues that they do not belong to historic conceptions of gothic fiction (1983).
		Compromise struck by Hale: "Literary genres do not emerge overnight, nor do they arise in cultural isolation. This is especially true of the Gothic, which not only underwent an initial period of gestation, development and decline … but also, from the very outset, borrowed liberally from a vast range of sources, foreign and domestic, literary, aesthetic, and scientific" (2002, p. 63).
		Hillesdal argues "…these heroines (Jane and Cathy) do not only contain conventional features, they also bring new elements which represent a significant disruption of the Gothic genre" (2011, p. 30). (2011, p. 30).
		• Consideration of genre and the stretching of boundaries is therefore used to facilitate interpretations and to develop conclusions.
Statistical analysis of regularities of populations, and the calculus of probabilities	*Partial mapping: link between probability and deliberate use of ambiguity/playing with language in English which sets up interpretation. Not quantitative in English.*	
The historical derivation of genetic development (1992, p. 4).	Historical context (important to consideration of individual texts, writers and genres).	Titles of Dickens' *Hard Times, for These Times* (1854) and Trollope's *The Way We Live Now* (1992, original publication 1875) acknowledge the particularity of historical time periods. Weller suggests these titles "imply a consciousness…of how the present differs from the past. Both continuity and change are presumed to be subjects of investigation for the sake of understanding the world in its current totality of relations" (2012, p. 295).

	Development and evolution of domain of English literature and genre.	Abraham [on Miller's *Death of a Salesman*]"Miller portrays the impact of the industrial word on human relationships in which technology overrides it, altering values and even language" (2011, p. xxvi). "[*Death of a Salesman*] seems to catch the paradoxes of being alive in a technological civilization" (Roudane, 1987, pp. 360–361).
Possible Additional Styles		
Structural		Gordon: "it is not the characters of the individual subjects of the novel nor the contents of Markham's narrative that shape the meaning of *The Tenant of Wildfell Hall*, but rather the relative dispensation of alternative narratives competing for our attention and hence for a textual priority" (1984, p. 719). Burkhart [on *Wuthering Heights*]: "a possible conclusion - although it is not the only conceivable explanation - is that the Cathy-Hareton romance of the second generation is not only the structural parallel but also the thematic equivalent to the Catherine-Heathcliff romance of the first generation. Such precision in structure, it seems, must have a relationship to what we make of the novel…" (1972, pp. 104-5). Novels explored and interpreted in terms of narrative structure. Academics have explicitly considered effects that structure has upon interpretation of text as a whole.

Examples included in the table (and sometimes within descriptions of the individual styles in the theoretical framework presented in Section 3.2) reflect, to some extent, the variety of sources considered during the process of analysis. They are taken from the range of source types discussed earlier and aim to cover a broad range of literature. However, when examples of domain-specific reasoning styles were observed in relation to a text, the next step often sought texts considering similar topics and the same texts. For example, if one critic considered Arthur Miller's *Death of a Salesman,* examining its status as a 'tragic' play, it was useful to search for other materials exploring a similar theme. This helped to develop detailed examples of engagement with styles of reasoning with some level of continuity in subject-matter. This does mean that at times breadth in coverage of literature critiqued is sacrificed in favour of depth. Adding to this restriction in focus are examples discussing similar literary sources for different reasoning styles. Thus, critique of works by the Brontë sisters is included for both the genre-based and structural reasoning styles. This mainly occurred because a range of reasoning styles were often identified in the process of considering an article or group of articles and these were noted as separate examples of those potential styles within Table 3.2. Thus, while attempts at broad consideration of a range of literature were made, examples in the framework do sometimes emphasise works by certain authors or from particular time periods. This represents an area which might benefit from further development in future research.

3.1.2   Exploring the National Curriculum and associated assessment materials

Two stages involved when creating a framework of reasoning styles for English have been detailed above. The first engaged with an existing framework of styles from science and mapped across both domains to consider whether there were any analogous styles suitable for English (Table 3.1). The second stage engaged with materials from the academic domain of English literature and added examples to preliminary styles, refined categories and considered other potential styles (Table 3.2). A third stage involved consideration of the Programme of Study for English in the National Curriculum (DfE, 2014) (Table 3.3). This document was analysed with a focus on exploring where reasoning was discussed or suggested, and on whether any of the potential styles already contained in the working table were implied. If these styles were referenced or indicated in some way in the Programme of Study, examples were added in an additional column. If potential styles not contained in the table were identified, additional rows could be used to record descriptions and examples. For clarity, examples from assessment materials (past SAT papers, a sample SAT paper and guidance for

test producers) are cited while all references to the Programme of Study are taken from the 2014

National Curriculum Framework document (DfE, 2014).

Table 3.3 Creation of framework of reasoning styles with reference to Programme of Study for English

Reasoning Styles in Science	Potential Reasoning Style in English	Examples of where discussed or implied in Programme of Study for English in National Curriculum
The simple method of postulation exemplified by the Greek mathematical sciences	Language/ linguistics	Content domain 2a: "give / explain the meaning of words in context" and 2g: "identify/explain how meaning is enhanced through choice of words and phrases" (Standards and Testing Agency (STA), 2015a, p. 7). "Language" used 68 times within Programme of Study (DfE, 2014). Aims: "The overarching aim for English in the National Curriculum is to promote high standards of language and literacy by equipping pupils with a strong command of the spoken and written language…" • "acquire a wide vocabulary, an understanding of grammar and knowledge of linguistic conventions for reading, writing and spoken language;" • "write clearly, accurately and coherently, adapting their language and style in and for a range of contexts, purposes and audiences" (DfE, 2014, p. 14). [Aims within 'spelling, vocabulary, punctuation and grammar'] "As vocabulary increases, teachers should show pupils how to understand the relationships between words, how to understand nuances in meaning, and how to develop their understanding of, and ability to use, figurative language. They should also teach pupils how to work out and clarify the meanings of unknown words and words with more than 1 meaning;" • "They should be taught to use the elements of spelling, grammar, punctuation and 'language about language' listed…Throughout the programmes of study, teachers should teach pupils the vocabulary they need to discuss their reading, writing and spoken language" (DfE, 2014, p. 16). Section devoted to 'spoken language' (DfE, 2014, pp. 18-19).

| | | Y2 Reading comprehension: "recognising simple recurring literary language in stories and poetry"; "discussing and clarifying the meanings of words, linking new meanings to known vocabulary"; "discussing their favourite words and phrases" (DfE, 2014, p. 29).

Y3 and 4: "They should demonstrate understanding of figurative language, distinguish shades of meaning among related words and use age-appropriate, academic vocabulary" (DfE, 2014, p. 34).

"Specific requirements for pupils to discuss what they are learning and to develop their wider skills in spoken language form part of this Programme of Study. In years 3 and 4, pupils should become more familiar with and confident in using language in a greater variety of situations, for a variety of audiences and purposes, including through drama, formal presentations and debate" (DfE, 2014, p. 35).

Y3 and 4 reading comprehension: "identifying how language, structure, and presentation contribute to meaning" (DfE, 2014, p. 37).
Non-statutory guidance: "Reading, re-reading, and rehearsing poems and plays for presentation and performance give pupils opportunities to discuss language, including vocabulary, extending their interest in the meaning and origin of words" (DfE, 2014, p. 38).

Y5 and 6: "teachers should continue to emphasise pupils' enjoyment and understanding of language, especially vocabulary, to support their reading and writing. Pupils' knowledge of language, gained from stories, plays, poetry, non-fiction and textbooks, will support their increasing fluency as readers, their facility as writers, and their comprehension" (DfE, 2014, p. 42).

"They should be able to reflect their understanding of the audience for and purpose of their writing by selecting appropriate vocabulary and grammar. Teachers should prepare pupils for secondary education by ensuring that they can consciously control sentence structure in their writing and understand why sentences are constructed as they are. Pupils should understand nuances in vocabulary choice and age-appropriate, academic vocabulary. This involves consolidation, practice and discussion of language. Specific requirements for pupils to discuss what they are learning and to develop their wider skills in spoken language form part of this Programme of Study. In years 5 and 6, pupils' confidence, enjoyment and mastery of language should be extended through public speaking, performance and debate" (DfE, 2014, p. 42). |

		Y5 and 6 reading comprehension: "identifying how language, structure and presentation contribute to meaning"; "discuss and evaluate how authors use language, including figurative language, considering the impact on the reader" (DfE, 2014, p. 45). KS3 reading: "read critically through: knowing how language, including figurative language, vocabulary choice, grammar, text structure and organisational features, presents meaning; recognising a range of poetic conventions and understanding how these have been used" (DfE, 2014, p. 83). KS3 grammar and vocabulary: "discussing reading, writing and spoken language with precise and confident use of linguistic and literary terminology" (DfE, 2014, p. 85). KS3 spoken English: "improvising, rehearsing and performing play scripts and poetry in order to generate languages and discuss language use and meaning, using role, intonation, tone, volume, mood, silence, stillness and action to add impact" (DfE, 2014, p. 85).
The deployment of experiment both to control postulation and to explore by observation and measurement	*Partial mapping: use of evidence in English (linked to focus on observation and focus on rigour in scientific style). No emphasis on manipulation in English.*	
Hypothetical construction of analogical models	Analogy	Content domain 2h: "make comparisons within the text" (STA, 2015a, p. 7). "Analogy" used once (Y5 and 6 Reading Comprehension Notes and Guidance; DfE, 2014, p. 46). "Compare" or "comparison" used seven times across curriculum document. Y5 and 6 Reading Comprehension: "making comparisons within and across books" (DfE, 2014, p. 45). Y5 and 6 Reading Comprehension Notes and Guidance: "Pupils should be taught the technical and other terms needed for discussing what they hear and read, such as metaphor, simile, analogy, imagery, style and effect;"

		"[Pupils] should have opportunities to compare characters, consider different accounts of the same event and discuss viewpoints (both of authors and of fictional characters), within a text and across more than one text.
		"Pupils should be shown how to compare characters, settings, themes and other aspects of what they read" (DfE, 2014, p. 46).
		KS3 reading: "re-reading books encountered earlier to increase familiarity with them and provide a basis for making comparisons"; "making critical comparisons across texts" (DfE, 2014, p. 83).
		KS4 reading: "re-reading literature and other writing as a basis for making comparisons"; "making critical comparisons, referring to the contexts, themes, characterisation, style and literary quality of texts, and drawing on knowledge and skills from wider reading" (DfE, 2014, p. 86).
Ordering of variety by comparison and taxonomy	Genre	Content domain 2f: "identify / explain how information / narrative content is related and contributes to meaning as a whole" (STA, 2015a, p. 7).
		"Genre" used only once (KS3 Reading; DfE, 2014, p. 83).
		Y1 Reading: "listening to and discussing a wide range of poems, stories and non-fiction at a level beyond that at which they can read independently; …becoming very familiar with key stories, fairy stories and traditional tales, retelling them and considering their particular characteristics" (DfE, 2014, p. 22).
		Y2 Reading: "listening to, discussing and expressing views about a wide range of contemporary and classic poetry, stories and non-fiction at a level beyond that at which they can read independently; …becoming increasingly familiar with and retelling a wider range of stories, fairy stories and traditional tales; being introduced to non-fiction books that are structured in different ways; recognising simple recurring literary language in stories and poetry" (DfE, 2014, p. 29).
		KS2 Reading Comprehension: "Pupils should be taught to: maintain positive attitudes to reading and an understanding of what they read by: increasing their familiarity with a wide range of books, including myths,

		legends and traditional stories, modern fiction, fiction from our literary heritage, and books from other cultures and traditions" (DfE, 2014, p. 44).
		KS2 Reading Comprehension: "Pupils should be taught to: maintain positive attitudes to reading and an understanding of what they read by: identifying and discussing themes and conventions in and across a wide range of writing" (DfE, 2014, p. 45).
		Lower KS2 Reading Comprehension: "listening to and discussing a wide range of fiction, poetry, plays, non-fiction and reference books or textbooks; reading books that are structured in different ways and reading for a range of purposes; …increasing their familiarity with a wide range of books, including fairy stories, myths and legends, and retelling some of these orally; identifying themes and conventions in a wide range of books; …recognising some different forms of poetry [for example, free verse, narrative poetry]" (DfE, 2014, pp. 36-37).
		Notes and Guidance: "Pupils should be taught to recognise themes in what they read, such as the triumph of good over evil or the use of magical devices in fairy stories and folk tales" (DfE, 2014, p. 37).
		Upper KS2 Reading Comprehension: "continuing to read and discuss an increasingly wide range of fiction, poetry, plays, non-fiction and reference books or textbooks; reading books that are structured in different ways and reading for a range of purposes; increasing their familiarity with a wide range of books, including myths, legends and traditional stories, modern fiction, fiction from our literary heritage, and books from other cultures and traditions; …identifying and discussing themes and conventions in and across a wide range of writing" (DfE, 2014, pp. 44-45).
		KS3 reading: "reading a wide range of fiction and non-fiction, including in particular whole books, short stories, poems and plays with a wide coverage of genres, historical periods, forms and authors, including high-quality works from English literature, both pre-1914 and contemporary, including prose, poetry and drama; Shakespeare (2 plays) and seminal world literature" (DfE, 2014, p. 83).

		KS4 Reading: "Pupils should be taught to: understand and critically evaluate texts through: drawing on knowledge of the purpose, audience for and context of the writing, including its social, historical and cultural context and the literary tradition to which it belongs, to inform evaluation;… make an informed personal response, recognising that other responses to a text are possible and evaluating these" (DfE, 2014, p. 86).
Statistical analysis of regularities of populations, and the calculus of probabilities	*Partial mapping: link between probability and deliberate use of ambiguity/playing with language in English which sets up interpretation. Not quantitative in English.*	
The historical derivation of genetic development	Historical context (important to consideration of individual texts, writers and genres). Development and evolution of domain of English literature and genre.	Y1 and Y2 Reading: "understand both the books they can already read accurately and fluently and those they listen to by: drawing on what they already know or on background information and vocabulary provided by the teacher" (DfE, 2014, p. 22).

Writing aims KS1 and 2: "Effective composition…requires clarity, awareness of the audience, purpose and context" (DfE, 2014, p. 16).

KS3 Reading: "Pupils should be taught to: understand increasingly challenging texts through: knowing the purpose, audience for and context of the writing and drawing on this knowledge to support comprehension" (DfE, 2014, p. 83).

KS4 Reading: "Pupils should be taught to: understand and critically evaluate texts through:
- drawing on knowledge of the purpose, audience for and context of the writing, including its social, historical and cultural context and the literary tradition to which it belongs, to inform evaluation
- making critical comparisons, referring to the contexts, themes, characterisation, style and literary quality of texts, and drawing on knowledge and skills from wider reading" (DfE, 2014, p. 86). |

		KS4 Writing. "Pupils should be taught to: write accurately, fluently, effectively and at length for pleasure and information through: selecting, and using judiciously, vocabulary, grammar, form, and structural and organisational features, including rhetorical devices, to reflect audience, purpose and context" (DfE, 2014, p. 87).
	Possible Additional Styles in English	
	Structural	Content domain 2f: "identify / explain how information / narrative content is related and contributes to meaning as a whole" (STA, 2015a, p. 7). Y5/6 Composition: "Pupils should be taught to: plan their writing by: identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own" (DfE, 2014, p. 48). Y5/6 Reading Comprehension: "Pupils should be taught to: understand what they read by: identifying how language, structure and presentation contribute to meaning" (DfE, 2014, p. 45). KS3 Reading: "Pupils should be taught to: read critically through: knowing how language, including figurative language, vocabulary choice, grammar, text structure and organisational features, presents meaning" (DfE, 2014, p. 83). KS4 Reading: "Pupils should be taught to: make an informed personal response, recognising that other responses to a text are possible and evaluating these" (DfE, 2014, p. 86).
	Prediction	Content domain 2e: "predict what might happen from details stated and implied" (STA, 2015a, p. 7). "Predict*" used five times across Programme of Study. Y1 Reading Comprehension: "predicting what might happen on the basis of what has been read so far" (DfE, 2014, p. 22).

		Y2 Reading Comprehension: "predicting what might happen on the basis of what has been read so far" (DfE, 2014, p. 29). Y3 and 4 and Y5 and 6 Reading Comprehension: "predicting what might happen from details stated and implied" (DfE, 2014, p. 37 and p. 45).
,	Summarisation	Content domain 2c: "summarise main ideas from more than one paragraph" (STA, 2015a, p. 7). "Summar*" used seven times across Programme of Study. Y3 and 4 Reading Comprehension: "identifying main ideas drawn from more than one paragraph and summarising these" (DfE, 2014, p. 37). Upper KS2: "[Pupils] should be able to summarise and present a familiar story in their own words" (DfE, 2014, p. 42). Y5 and 6 Reading Comprehension: "summarising the main ideas drawn from more than one paragraph, identifying key details that support the main ideas" (DfE, 2014, p. 45). KS4 Reading: "reading in different ways for different purposes, summarising and synthesising ideas and information, and evaluating their usefulness for particular purposes" (DfE, 2014, p. 86).
	Inference	Content domain 2d: "make inferences from the text / explain and justify inferences with evidence from the text" (STA, 2015a, p. 7). "Infer" used twelve times across Programme of Study. Y1 and Y2 Reading Comprehension: "making inferences on the basis of what is being said and done" (DfE, 2014, p. 22 and p. 29).

		Y3 and 4 and Y5 and 6 Reading Comprehension: "drawing inferences such as inferring characters' feelings, thoughts and motives from their actions, and justifying inferences with evidence" (DfE, 2014, p. 37 and p. 45). KS3 Reading: "making inferences and referring to evidence in the text" (DfE, 2014, p. 83). KS4 Reading: "seeking evidence in the text to support a point of view, including justifying inferences with evidence" (DfE, 2014, p. 86).
	Use of evidence from primary source material	"Evidence" used nine times across Programme of Study. Y3 and 4 and Y5 and 6 Reading Comprehension: "drawing inferences such as inferring characters' feelings, thoughts and motives from their actions, and justifying inferences with evidence" (DfE, 2014, p. 37 and p. 45). KS3 Reading: "making inferences and referring to evidence in the text" (DfE, 2014, p. 83). KS4 Reading: "seeking evidence in the text to support a point of view, including justifying inferences with evidence; distinguishing between statements that are supported by evidence and those that are not, and identifying bias and misuse of evidence" (DfE, 2014, p. 86). KS4 Writing: "selecting and organising ideas, facts and key points, and citing evidence, details and quotation effectively and pertinently for support and emphasis" (DfE, 2014, p. 87).

In addition to analysis of English literature in academic contexts detailed in Section 3.1.1, Table 3.3 illustrates the pragmatic approach adopted in this project when creating the reasoning styles framework. National Curriculum documents for the English Programme of Study (DfE, 2014) were analysed alongside end of KS2 SAT materials and a document advising KS2 test developers produced by the Standards and Testing Agency (2015a).

Although combining consideration of the academic culture with analysis of government-produced National Curriculum documents may gain increased support from schools, it is important to consider potential objections to this approach. This project is located within the cognitive historical tradition and the argument that styles of reasoning exist within a culture and thus should be identified through analysis of that culture. National Curriculum documents and end of KS2 assessment materials for primary English may not represent a direct reflection of the academic culture of English literature. This could be due to differences naturally occurring because of academic progression beyond school years and the need for schools to make learning accessible to younger children. It could also be due to the difference in focus in school English, focusing on skills of reading, writing and speaking and listening, and academic English literature, focusing largely on the varying approaches to analysis of literary texts. However, other reasons may lead to a gap between expectations and outcomes in Higher Education and academia, and expectations and outcomes in primary education. National Curriculum documents and assessment materials are highly contested and politicised. They reflect the agenda and priorities of political parties, which may or may not reflect the priority of arming students with the necessary pre-requisite skills to be able to reason successfully in an academic discipline. These documents also reflect a specific time period, social context and country. Analysis of academic articles within English literature from other countries does not suggest major differences in reasoning styles between countries, yet school curricula differs widely between countries. The reasons for this are again, complex. Political and ideological values, economic contexts and other social factors may help to explicate factors affecting curricula decisions. There are, therefore, some difficulties involved in using National Curriculum documents produced for particular reasons and within a particular context to support the establishment of key styles of reasoning in English literature.

Despite these objections, the motivation for including analysis of curriculum documents in this project is pragmatic: primarily for legitimacy and to gain support and co-operation from schools by explicitly considering links between theory and practice. This project intends to develop materials to

be used in primary schools which might strengthen students' ability to reason in particular ways identified as important in English. To achieve these ambitions, styles identified must be clearly communicable to teachers and must also persuade teachers of their practical value. The argument for trialling activities which promote key reasoning styles would be strengthened if teachers were assured of their links and compatibility with the National Curriculum and its associated assessments. Working in an education system which already places multiple and sometimes conflicting demands upon schools and teachers, it was necessary to ensure this project was not seen as another initiative, constructed outside of the school setting and with limited awareness of extraneous demands already placed upon schools. Thus, this project aimed to secure a theoretical foundation for the framework, supported by research and analysis of the academic English literature culture, but also wished to supplement this with consideration of the practical context in which schools operate under the National Curriculum.

Moreover, while this project ultimately considers reasoning styles within academic cultures, which can then be broken down to teach progressively throughout school, the contribution of school subjects to academic cultures should also be remembered. It may be possible that the culture of English literature represents a combination of that practiced within academia and with practices in other settings, such as schools, colleges, newspapers and internet-based outlets.

3.1.3   Creating the Framework

Initial development of the framework of reasoning styles for English considered parallels with reasoning styles for science. A table containing a tentative list of potential reasoning styles was developed focusing on genre, language, analogy and historical consideration. This early list was then considered alongside materials from the academic domain of English literature. Examples of engagement with any of the potential reasoning styles from these materials were added in an additional column within the table. Descriptions of the styles could also be clarified and refined by considering ways in which the styles manifest in academic literature. Possible additional styles could be noted in extra rows. A third stage engaged with curriculum documents to add examples of where potential reasoning styles were discussed or implied and to determine whether additional styles needed to be considered. This supported construction of the framework of reasoning styles

presented in Section 3.2 and led to reflection on potential styles which were not selected in the final version of the framework (Section 3.3.2).

Following analysis undertaken to identify reasoning styles appropriate for primary English, it is intended that the description of each reasoning style will follow the same structure. First, the style will be defined, with parameters for what it does and does not include established. Each style will be described in terms of its hallmarks and resonance within academic English literature, with its development over time traced. Main areas of debate within the individual reasoning styles from the academic literature (focusing on literary analysis) and from professional literature (focusing on pedagogy) will be explored. Objections to styles will be raised and discussed. Examples of the reasoning styles being used authentically will be taken from academic texts and sources such as lecture presentations. These examples will seek to cover a broad range in terms of texts and text-types they discuss as well as place and time of publication.

The styles will then be considered in terms of their presence within primary education, including a focus on how this may have changed over time and where they are implied within the English Programme of Study and end of KS2 assessment materials. Each style will be considered in relation to curriculum materials, although statements from these documents rarely make the thinking and reasoning skills to be developed explicit. Since the new National Curriculum (DfE, 2014) was first assessed in the 2016 SAT tests, the only other source of assessment questions available at the time of analysis for the conceptual enquiry phase (2016-17) was a sample reading test created by the Standards and Testing Agency (STA) to demonstrate an example of the new test structure and requirements to schools. Sections focusing on reasoning styles implied in end of KS2 assessment materials will therefore be based primarily on the two available SAT papers as well as guidance material produced for test developers (STA, 2015b; 2015a; 2016). Discussions about questions from these SAT papers will also refer to *content domains.* The information for test developers document (STA, 2015a) includes a list of eight content domain elements within comprehension which will be sampled by tests over time: "the content domain sets out the relevant elements from the national curriculum programme of study (2014) for English at key stage 2 that are assessed in the English reading test" (STA, 2015a, p. 7). These elements will be referred to as appropriate within discussion of each of the five styles. Thus, in addition to exemplification within academia, debates within professional and pedagogical literature will be reflected upon and individual styles will be mapped onto the current Programme of Study for English (DfE, 2014).

Study Two will provide examples of how three of the individual reasoning styles might manifest themselves at the primary stage of development. These examples are part of development of a coding framework to operationalise the styles. Study Two will also offer some reflection on possible indicators of progression within individual reasoning styles. The SOLO taxonomy (Biggs & Collis, 1982) will be drawn upon to identify differences in levels of understanding displayed during reasoning. This will support teachers to identify the different levels of quality or progression involved within reasoning and will support endeavours to develop the level of connectedness and relational understanding exhibited by students over time.

3.1.4   Criteria

The process of identifying reasoning styles using a combination of materials from the academic culture of English literature and those important within primary English has been described. The structure for presenting and discussing each identified reasoning style has also been made clear above. It is now important to explicitly outline the criteria to be used when selecting reasoning styles to be included in the framework. These criteria will also facilitate evaluation of outcomes from the conceptual enquiry; namely, the reasoning styles presented.

Thus, criteria for selection and inclusion of reasoning styles for primary English are as follows:

- *Theoretical and academic support.* Styles should be identifiable in the academic culture of English literature; they should represent key ways of forming and justifying conclusions within products of the culture. This should be supported within research literature in terms of methods of literary analysis/critique.
- *Applicability to primary English*. Styles should bear some resonance with the reasoning styles important within English education in primary schools. Although school-based examples will obviously illustrate differences in progression within the styles, key hallmarks of individual styles should be applicable and appropriate from primary school onwards. Elements of the styles should also be observed in National Curriculum documents, although not necessarily explicitly or to a large extent.

- *Internal coherence*. Styles should be distinguishable from one another. While overlaps between styles of reasoning may occur in practice, the descriptions of each should be distinctive from the others.
- *Communication with teachers*. The styles framework should be communicable to teachers and schools. It is important that schools can understand main ideas so that they can adapt their practice in efforts to promote styles of reasoning in English.

3.1.5   Conclusion

This section has detailed the methods used to create a framework of reasoning styles for primary English. Using thematic analysis, themes were sought within reasoning styles identified for science which might also be considered in relation to English. Implicit argumentation techniques and structures were therefore mapped between the two domains. Products from the culture of English literature were then considered, to seek key styles of reasoning used by academics and within literary critique. The third stage considered curriculum documents, ensuring that any potential styles identified were relevant and applicable to the primary education phase. Each of the three stages involved in the creation of the framework of reasoning styles for primary English to be used in Study Two helped to develop, modify and clarify this framework. Tables 3.1, 3.2 and 3.3 illustrate such development. Criteria to be used when selecting reasoning styles has also been made explicit in this section. Section 3.2 will present main findings from Study One.

3.2   Study One Findings

The section above outlines the three-pronged analysis process undertaken, where documents from English literature, the National Curriculum and its associated assessment materials (SAT papers and guidance produced for test developers) were considered to create a framework of reasoning styles for primary English. Production of this framework was guided by strict criteria which managed and enforced rigour on the selection and inclusion process. The overall result of this conceptual enquiry is the classification and description of domain-specific reasoning styles for primary English which have educational significance.

3.2.1   Findings of NC analysis

Following analysis of National Curriculum documents, it was found that the required reasoning styles to be developed through education are not made explicit (this is clear in later discussion of each of the styles). To begin, there is the difficulty of terminology. Reasoning engenders different connotations between and within various academic disciplines. Other terms proposed (such as critical thinking, thinking skills) may or may not reflect processes implied by the term reasoning as used in this thesis and have also been subject to debate. While issues surrounding terminology will not be elaborated upon further at this point, what becomes apparent when analysing the Programme of Study for English, as part of the National Curriculum as a whole, is that there is no clear consideration given to developing thinking or reasoning skills (i.e. the skills required during the process of forming and supporting conclusions). While aspects are mentioned throughout, there is no framework for progression and statements implying reasoning styles (such as those described in this project) are commonly repeated across key stages. Within description of each of the styles, this thesis will consider where these styles are mentioned (either explicitly or implicitly) in the Programme of Study and associated assessment materials.

3.2.2   The reasoning styles framework for primary English

Based upon analysis described above, five key styles of reasoning will be discussed. It is important to explicate that these styles are not presented as objectively and exclusively identified. As Hacking stated in relation to scientific styles: "[styles of reasoning] do not answer to some other, higher, or deeper, standard of truth and reason than their own…they have become part of our standards for what it is to find out the truth" (2012, p. 605). There may be additional styles important in primary English, or some may need to converge. Other academics may identify different categories when considering key styles of reasoning in English. Taking these possibilities into account, the five styles described here are presented as what has emerged from analysis undertaken within this project, considered to represent the best and most rigorous means of addressing the research questions.

It is important to note that there is no hierarchical structure within styles identified and the importance or predominance of each varies according to focus, literary text and purpose of analysis. It is also likely that more than one style will be drawn upon when reasoning about a text. Although they are described separately, as mentioned previously, this is intended to make the key modes of reasoning explicit so that they can be targeted in English lessons and analysed individually within the academic culture.

The five key styles are thus termed:

- The genre-based style (GRE)
- The structural style (SRE)
- The analogy-based style (ARE)
- The contextual style (CRE)
- The language-based style (LRE)

Acronyms follow the format used in the coding instrument developed during Study Two. CDAS (Vrikki et al., 2019) uses 'RE' to correspond to the reasoning coding category. Letters are added in front of this acronym here to denote specific styles of reasoning in the teaching of English in primary schools.

It is important to consider two dimensions of reasoning within English. These styles can be drawn upon by authors when creating texts as well as by individuals when interpreting and critiquing texts written by others (see Section 3.1.1). The reasoning styles have the same foundations, but when critiquing the literature of others, this reasoning is taken from an analytical perspective. This can be explained by considering the parallel lists below:

When creating texts, the author:

a) Categorises the text into literary *genres* in order to draw upon or stretch genre conventions;
b) Makes use of and reflects upon *structures* in the text designed to create unity;
c) Uses *analogies* to create, explore and contrast images, characters and themes within and between texts;
d) Considers background *contextual* aspects which support the creation (and guide subsequent interpretation) of a text;
e) Uses *language* and linguistic devices to direct and flavour text.

When interpreting and critiquing texts, reasoning draws upon:

a) Consideration of *genre*(s) drawn upon within a text, including associated conventions, how these are employed, and to what effect;

b) Reflection upon organisational devices and *structural* features used within a text to achieve a sense of unity;

c) Consideration of *analogies* to other sources which create, explore and contrast images, characters and themes within and between literary texts;

d) Reflection upon *contexts* (e.g. historical, social, religious, biographical) in which a text is set and/or was created;

e) Consideration of the impact or effect of linguistic devices and *language* choices.

The following discussion will now offer a fuller consideration of these styles.

3.2.3   Genre-based Style (GRE)

One style of reasoning identified in the academic culture of English literature is the genre-based style (GRE). Bowler offers a useful general definition of classification: "in its simplest form, classification is merely defined as the ordering of entities into groups or classes on the basis of their similarity" (1992, p. 165). This style also has clear links to the classificatory style identified in science (Crombie, 1995), although has specific meanings within English literature. While genres may conjure images of classification, many reject this simplistic conception of genre, or at least consider classification as merely one aim of genre (Blanchot, 1959; Croce, 2007; Frow, 2006; Rosmarin, 1985). Simply stated, this style focuses on conventions of genre and GRE makes use of genre categories to support the process of forming conclusions. Thus, when reading texts in relation to other texts, thus considering elements of genre, "a certain amount of similarities arise that allows a reader to group texts. These categories do not provide all the information needed to interpret the text, but they provide some valuable insight into the text" (Mayfield, 2010, p. 38).

In this section, definitions of genre and GRE will be considered accompanied by examples of academic engagement with this reasoning style. Consideration of genre within National Curriculum materials and in educational discourse more broadly will then be considered before providing examples of how the genre-based reasoning style might manifest in primary English.

Changing Definitions of Genre

The term 'genre' has both broad and specific meanings. In a broader sense, genres in literature can relate to distinctions, particularly in terms of structure, between narratives, drama, poetry and so on. Yet these genres can be further broken down. For example, genres may focus more thematically on tragic, comic and epic categories. In popular culture, narrative can be divided into sub-categories such as romance, crime, adventure and science-fiction. As Cohen notes: "genres have popular and polite functions and statuses" (1986, p. 216). Since 'genre' encompasses a range of meanings, its use in interpretation is complex.

While identification of specific genres has a complicated history, the basic premise and utility of the concept of genre is summarised in Reichert's definition of genre as "any group of works selected on the basis of some shared features" (1978, p. 57). Since the establishment of genres "involves the human need for distinction and interrelation" (Cohen, 1986, p. 204), it is unsurprising that the concept has been drawn upon since the beginnings of organised, oral society. Cairns (1972) describes the focus on classifying content in early conceptions of genre which she argues was primarily for the purpose of supporting the listener in their construction of meaning through employment of genre markers.

It is possible to trace a historical development of genre beginning with Aristotle's conceptions of epic poetry, tragedy and comedy in *Poetics* (Aristotle, 335BC/2013). Categories were revised during the Romantic period and reconceptualised as historically determined dynamic entities. Darwin's Origin of Species may also have impacted upon conceptions of genres as evolutionary paradigms (Cohen, 1986). Cohen recognises the need for change within genre classification in response to changing societies. He argues that groups are formed at particular historical points and as these groups grow, "they are subject to repeated redefinitions or abandonment" (1986, p. 210). Others also support the

cultural basis of genre. White similarly argues that genres belong to culture, rather than to nature, and by consequence, are formed to fulfil specific purposes (2003). The fluidity of genre is captured by Bakhtin: "genre is reborn and renewed at every new stage in the development of literature and in every individual work of a given genre. This constitutes the life of the genre" (1984, p. 106). While this evokes the sense of evolution within categories of genre as well as the changing nature of individual genres themselves, it also captures the difficulty of tying specific texts to individual genres. This "continual founding and altering of horizons" (Jauss, Bahti, & De Man, 1982, p. 88) reflects the open nature of genre categories which are impacted upon by each new literary work 'belonging' to them. This notion was apparent in Aristotle's original conception of genre. Even for him, genres were not absolute categories and genres themselves did not have an individual existence (Aristotle, 2013; Cohen, 1986). Only through comparisons with other genres could the sense of a particular category be evoked (Seitel, 2003).

The genre-based reasoning style

Use of genre within literary analysis has been criticised by some amid claims that use of such categories reduces and distorts individual literary texts (Blanchot, 1959; Croce, 2007; Frow, 2006; Lima, 1996; Rosmarin, 1985). Despite such objections, analysis in this project revealed widespread engagement with genre in both the academic culture of English literature and in the primary English culture (including National Curriculum and assessment materials). Although this style has been termed genre-based, it is important to note that classifying a text as belonging to a certain genre is not necessarily a form of reasoning. Rather, "the purpose of criticism by genre is not so much to classify as to clarify…bringing out a large number of literary relationships that would not be noticed as long as there were no context established for them" (Frye, 1957, pp. 247–248). While it can be argued that genre classifications may not support interpretation of specific texts since texts are indeterminate, consideration of genre can help to "provide expectations for interpretations…[and also to] provide conventions for interpretation" (Cohen, 1986, p. 210). Jameson suggests a way in which genres may facilitate interpretation when he argues that genre exists as a social contract between the author and a public. Thus, in establishing a text within particular genre-based conventions, a writer is able "to specify the proper use of a particular cultural artefact" (Jameson, 1981, p. 106). Bruner also argues: "while genres…may indeed be loose but conventional ways of representing human plights, they are also ways of telling that predispose us to use our minds and

sensibilities in particular ways" (1991, p. 15). Consideration of genre conventions, despite their resistance to absolute definition, can therefore represent a useful means of interpreting a text. Genres evoke different connotations which can then facilitate analysis. This is especially the case in examples where genre conventions have been stretched or even shattered. It is usually in these cases that authors consciously selected and then reinvented a genre to achieve particular effects. Through analysis of these effects, deeper readings of a text may be achieved. Knowledge of genre can therefore be drawn upon to support and justify conclusions as part of the reasoning process. Examples of GRE from English literature will now be shared.

Examples of genre-based reasoning in English literature

There has been much consideration of whether Arthur Miller's play, *Death of a Salesman* (1949)*, belongs to the genre of tragedy and by consequence, whether the protagonist, Willy Loman, can be considered tragic. This was the theme in a lecture given by Dr James (pseudonym) as part of the *Introduction to Drama* undergraduate module at Durham University. Dr James asked whether the play can be considered tragic. She first considered Aristotelian conceptions of tragedy, including the need for the protagonist to be of noble birth, and then juxtaposed this genre requirement with the everyday 'low-man' image of Willy. She considered changing definitions of the tragic genre and questioned the need for noble protagonists in modern-day conceptions of tragedy. This argument therefore considers the stretching of genre conventions within *Death of a Salesman,* and may also point to the evolution of this genre as a response to changing societal beliefs, values and needs. This theme is also considered by other literary critics. Schweinitz implies the evolution of genre by asking whether there is a structure of value in Death of a Salesman "in any way analogous to that of the older epic and tragic tradition" while also recognising that this is not equivalent to "are the values the same?" (1960, p. 92). He therefore recognises inevitable differences in literary works within the same genre given societal and cultural change but does not see these works as belonging to different genres, rather, he argues that genres themselves grow to facilitate changing cultures. This is supported by reference to the absence of a God-like conception "dispensing of perfect justice or eternal damnation" (Schweinitz, 1960, p. 93) in modern tragedies. Schweinitz describes the "vast rearrangements and shifts of poles of value" (1960, p. 96) because of changes in Western culture. This again supports the evolution of genre in response to societal needs. Despite the inevitable changes and adaptations, there remains "a basically traditional…tragic structure" (Schweinitz, 1960,

p. 96). Consideration of genre and its associated conventions and applying these traditions to particular texts which deliberately draw upon and manipulate conventional generic structures, can therefore help to make meaning and facilitate interpretation of texts. This represents a key style of reasoning used in English Literature.

Examples of academic engagement with GRE in English literature help to illustrate the genre-based reasoning style identified in this project. Focus will now move to consideration of the use of genre in education, which contributes to the identification of GRE as a reasoning style for primary English.

Genre within education

Use of genre and genre-theory within education prompts different responses. Objections echo problems identified by academics. For example, Michael Rosen, esteemed children's author, poet and university teacher, describes the prominence of genre in the National Literacy Strategy based on one theory: "one single theory was used as the main prop and justification for how different ways of writing and speaking would take place in every primary (later, in secondary) school" (Rosen, 2013, p. 4). Similar to the difficulties with genre theory in general, Rosen points to the ambiguity of definitions ("we use the word [genre] inconsistently and non-systematically") and points out their subjective nature ("the genres we have invented are not structures in nature, deduced empirically from investigation and experiment" (2013, p. 7)). Rosen also points to the potential dangers of adopting genre-theory in education: "problems arise in education if we (1) treat these categories as if they are hard and fast descriptions of water-tight, 'discreet' categories and (2) we teach to the category" (2011, p. 7).

While these concerns may be well-founded, others have argued against Rosen's criticisms. In response to Rosen's claim about the unempirical nature of genre, Christie suggests that the systematic functional linguistics (SFL) tradition did not invent genres, instead they were identified through exhaustive analysis of children's texts: "they are what emerged from close analysis of the many reading and writing tasks in all school subjects [across primary and secondary schooling]" (Christie, 2013, p. 12). Importantly, Christie also suggests that these genres are not specific to school-based contexts: "close study of the genres found in many areas beyond the school reveals

that they relate very closely to those found in schooling" (2013, p. 12). While she does recognise the differences in "fields of experience and knowledge" between genres dominating in schools and those beyond schooling, and the tendency for primary schools to teach "canonical" or "elemental" genres, Christie suggests that focus in primary education is to develop students' proficiency so that "they learn to play with and adapt the various genres, sometimes evolving new variations, elsewhere employing known ones to make new meanings, thereby demonstrating the infinite flexibility of such genres for making meaning" (2013, p. 12). This, according to Christie, reflects the nature of genres themselves which are "capable of constant adaptation and shift, under the pressure of social change in which individual creativity plays an important part" (2013, p. 12). Of course, the evolutionary nature of genre mirrors earlier discussion which drew upon ideas of Aristotle, Bakhtin and Cohen, among others.

Christie also argues against another of Rosen's claims. Rosen suggests that the formulaic teaching which accompanies a focus on genre limits a student's power, since they execute no real choices regarding what (and how) they write. Rather than this limiting their power, Christie suggests that by bringing genres into consciousness, the modes of creating meaning are made visible to students which is empowering (2013, p. 18). She also points to the cultural nature of genres by suggesting their emergence occurs "because they represent ways of getting things done" (2013, p. 12). Christie suggests "learning the genres of one's community is a necessary part of learning its culture and its meanings" (2013, p. 13). This represents a similar stance to that taken in this project, situated within the field of cognitive history and arguing that different styles of reasoning are drawn upon across academic disciplines. It also relates to the constructivist aims of "surfacing and animating" (Perkins, 2006, p. 50) discussed in the Literature Review chapter. Christie explicitly discusses discipline-specific differences relating these to school contexts:

> The principal purpose of writing in contemporary societies is to construct, store, disseminate and critique the various disciplines or bodies of knowledge valued in English-speaking traditions and institutions…[In secondary education] the characteristic discourses of the different subjects emerge most distinctively: knowledge construction in science, mathematics, English, history and so on is increasingly expressed in different genres, different ways of reasoning, different ways of handling the 'uncommonsense' knowledge that the various disciplines represent" (2013, p. 18; Christie & Martin, 2007; Christie & Maton, 2011).

This has clear parallels to arguments about disciplinary-specific reasoning styles developed in this thesis. Moreover, Christie suggests the utility of acknowledging these differences, in terms of genres,

or more broadly, ways of communicating, within schools: "teachers who are made aware of [the linguistic features characteristic of the various disciplines] can guide desirable pedagogies for the teaching of literate behaviour" (2013, p. 18). This argument could also be extended to one made in this project, that explicating styles of reasoning in an academic culture can benefit teachers and thus students by equipping them with skills necessary to participate in a specific domain. It has also been argued that genre can support literacy educators in their endeavours to address the changing demands associated with globalisation since it helps to "elaborate writing as a focused, purposive, highly-differentiated task" which then supports growing demands for particular forms of communication within professions, disciplines and everyday life (Bazerman, Bonini, & Figueiredo, 2009, p. x).

While discussion above does not represent an exhaustive consideration of genre-theory within education, it is useful in that it illustrates key objections to a focus on genre in schools, as well as providing responses to such objections and arguments in favour of this approach. It also illuminates links between consideration of genre-theory in wider society, and genre-theory as it is adopted in education.

Consideration will now move to consider engagement with genre in National Curriculum materials for the subject of English in England.

Genre within the English Programme of Study

The thematic analysis procedure for identifying key reasoning styles in English is described in Section 3.1. Part of this three-pronged analysis involved engagement with curriculum materials. As already indicated, this aligned with pragmatic intentions which aim to stimulate improved teaching of reasoning in primary English. Genre-based reasoning became apparent during analysis of texts and materials from the academic discipline of English literature. It was therefore important to consider the extent to which genre-based reasoning would support curriculum (particularly primary curriculum) objectives in English schools.

Although the term 'genre' is used only once in the English Programme of Study (as part of the KS3 content for the *Reading* strand (DfE, 2014, p. 83)), its meaning and usage are implied much more frequently than this. This most obviously begins in the programme for KS2. In the *comprehension* aspect of *reading* for years 3-4, the document states that students should be taught to develop positive attitudes and understanding of what they read by: "listening to and discussing a wide range of fiction, poetry, plays, non-fiction and reference books or textbooks"; "increasing their familiarity with a wide range of books, including fairy stories, myths and legends, and retelling some of these orally"; and "identifying themes and conventions in a wide range of books" (DfE, 2014, p. 36). These requirements are elaborated upon in the non-statutory *notes and guidance material*: "students should be taught to recognise themes in what they read, such as the triumph of good over evil or the use of magical devices in fairy stories and folk tales" (2014, p. 37). This statement implies coverage and consideration of the thematic aspect of genre, where literary texts are grouped according to their main messages and content structures. The *notes and guidance material* also draws upon another element of genre: "they [students] should also learn the conventions of different types of writing (for example, the greeting in letters, a diary written in the first person or the use of presentational devices such as numbering and headings in instructions)" (2014, p. 37) This is also evident in the statutory requirement of "reading books that are structured in different ways and reading for a range of purposes" (2014, p. 36). These statements therefore draw upon the structural aspects associated with different text types and genres.

Consideration of the structural elements of genres is also evident in the *writing composition* aspect of the Programme of Study for years 3-4. This states that students should be taught to "plan their writing by: discussing writing similar to that which they are planning to write in order to understand and learn from its structure, vocabulary and grammar" (2014, p. 40). This resembles Christie's discussion earlier where, within the SFL tradition, primary-aged children are taught elementary genres to gain proficiency before adapting and playing with these in later schooling. By encouraging students to model their own writing on already existing texts, it seems that the Programme of Study aims to develop proficiency by encouraging students to learn from existing text structures and language features. While again, this draws upon the structural element of genre rather than content-based conceptions, this may reflect the age and abilities of students at lower KS2. Despite the primarily structural focus, composition requirements do imply consideration of content-based elements of genre too. Thus, students should be taught to "draft and write by: organising paragraphs around a theme; [and] in narratives, creating settings, characters and plot" (2014, p. 40). While this is at a relatively low level of demand, this aspect of the Programme of Study seems to

reflect some engagement with thematic elements of genre, particularly in relation to narrative expectations.

The years 5-6 Programme of Study also reflects consideration of genre. Within the *reading comprehension* requirements, students should be taught to:

> Maintain positive attitudes to reading and an understanding of what they read by:
> - continuing to read and discuss an increasingly wide range of fiction, poetry, plays, non-fiction and reference books or textbooks;
> - reading books that are structured in different ways and reading for a range of purposes;
> - increasing their familiarity with a wide range of books, including myths, legends and traditional stories, modern fiction, fiction from our literary heritage, and books from other cultures and traditions;
> - identifying and discussing themes and conventions in and across a wide range of writing (2014, pp. 44-45).

These requirements suggest extending the range of texts students should be exposed to but are not specific or explicit in this respect (as was previously the case in the National Literacy Strategy (DfEE, 1998)). This could be considered both an advantage and a disadvantage. On the one hand, teachers and schools are freed to include texts considered interesting or engaging to the students in their classes without restrictions placed in terms of specific texts, text types or genres covered. Yet on the other hand, the "increasingly wide range…" of the first bullet point is somewhat vague and does not specify the 'elementary' genres deemed important in primary education by proponents like Christie (2013).

There is also no obvious framework for progression in terms of genre-based knowledge and understanding. While the first bulleted statement in years 5-6 adds the word "increasingly", this statement is almost identical to that in the years 3-4 section. Similarly, the second bulleted statement relating to different text structures and the need to read for a range of purposes is also identical to that found in requirements for years 3-4. The third requirement relating to the range of books does add the need to include "fiction from our literary heritage, and books from other cultures and traditions" to the statement in the lower KS2 programme, but this is still rather vague. Moreover, the fourth statement cited above, relating to discussion of themes and conventions, is also almost identical to the statement in the Programme for years 3-4. It may be expected that students learn through exposure to a wide range of texts and develop skills such as identifying themes and conventions throughout school years, even beyond primary and perhaps in a spiral format where key learning is revisited and reinforced. However, by not specifying how students

should be taught these skills progressively, teachers may encounter difficulties and variations in interpretation and pitching of these statements.

The difficulty with progression in terms of engagement with genre continues beyond primary years. Additional elements are added to the range of texts to be considered in KS3 and KS4:

> Reading a wide range of fiction and non-fiction, including in particular whole books, short stories, poems and plays with a wide coverage of genres, historical periods, forms and authors, including high-quality works from English literature, both pre-1914 and contemporary, including prose, poetry and drama; Shakespeare (2 plays) and seminal world literature (KS3) (2014, p. 83).
>
> Reading a wide range of high-quality, challenging, classic literature and extended literary non-fiction, such as essays, reviews and journalism. This writing should include whole texts (KS4) (2014, p. 86).

However, not much is added in terms of specific skills or understanding to be developed. There is no explicit mention of thinking, reasoning or even dialogic practices which might accompany such study and indicate progression.

Genre within KS2 assessment materials

Analysis of end of KS2 assessment materials reveals that genre is not explicitly discussed in either the Programme of Study or in the assessment guidance materials. Despite this absence, genre is implied in both. Elements of genre are indicated within several questions within the sample reading SAT (STA, 2015b) and the actual 2016 paper (STA, 2016). The sample paper includes a question asking students to identify a group of words "that shows that Anousheh wrote her blog for others to read. Answers could quote '(Well) my friends' or 'everyone wants to know'" (STA, 2015b, p. 10). This requires students to consider the intended audience and purpose of a text, which provides clues regarding the genre of that text.

The creation of settings within genres is the focus of question 27 (indicated as an inferential question) in the sample paper: "how does the first paragraph suggest that the characters are in a 'lost world'?" (2015, p. 20). Consideration of setting is reinforced in question 33, although labelled as focusing on the enhancement of meaning through word and phrase choice (domain 2g). This

question directs students to a paragraph beginning "I had the same feeling of mystery and danger around us" (2015, p. 24). They are then asked to identify different words from the paragraph which suggest danger. This requires students to engage with language employed by authors to create settings. While setting is not synonymous with genre, students will have been exposed throughout their primary years to a range of genres (including narrative genres), each associated with different settings.

Some questions also require students to consider messages within the texts that they have read. Question 24 in the sample paper (labelled as a summary question), asks students to select from a choice of four descriptions representing "the main message of the poem" (STA, 2015, p. 18). The correct answer ("people should think about how their actions affect others" (STA, 2015, p. 18)) is one of two possible answers which represent broader key messages often found within particular genres (the other broad option, although still more limited than the previous one, is "people should overcome their fear of nature" (STA, 2015, p. 18)). The alternative two options are very specific to the particular text and offer a very limited message ("people can learn a lot from holding small creatures"; "people are much bigger than frogs and snails" (STA, 2015, p. 18). The message of a text is a key issue often considered in literature. This can be considered in fairy tales from an early age. Consideration of key messages and themes is also apparent in a question from the 2016 SAT. Question 20 asks: "do you think that Martine will change her behaviour on future giraffe rides?" (STA, 2016, p. 18). This is linked to the *prediction* content domain (STA, 2015a) but requires consideration of key messages from a text. Acceptable points to achieve marks include "she had learnt from her experience" (STA, 2016, p. 18). This demonstrates reflection upon key morals developed within genre structures. A similar prediction question (number 36) features in the sample paper (STA, 2015, p. 26). This asks what the last paragraph suggests might happen to the explorers next. Acceptable points draw upon evidence indicating genre structures within the text: "death/attack/threat" identified by evidence such as "feelings of danger/gloom/constant menace"; "lost" evidenced by "gloom/shady foliage/rocks"; and "discovering other dinosaurs" linked to evidence of "other creatures/constant menace/terrors…" (STA, 2015b, p. 26). This question requires students to engage with features of the text described within a genre and use this understanding to predict what would happen next, according to established genre-based conventions.

Most of these questions merely imply the need to engage with genre, and could also be discussed in terms of structural undertsanding. The lack of specific reference to genre within the Programme of

Study and its associated assessment materials may hinder a focus on genre-based reasoning as a key style to be promoted in primary English. Yet consideration of genre still predominates within classrooms (e.g. Rosen, 2011), perhaps partly due to the legacy of the National Literacy Strategy. Consideration may be more subtle than the Programme of Study and the assessment materials suggest; perhaps because it is taken for granted that genre and reflection upon differences between genres will already feature strongly within primary English education. Reading materials for the 2015 sample paper and the 2016 test provide examples of different genres and by implication expect students to be able to engage with these genre-based structures. The 2016 SAT includes two narrative extracts and a non-fiction article or non-chronological report.

This section has presented the main tenets of the genre-based reasoning style, which emerged as a key style of reasoning important within both English literature and primary English during the conceptual enquiry phase of the project (Section 3.1). Definitions, objections and examples have all been considered, with a focus on how genre is presented in curriculum materials supplementing discussion.

3.2.4   Structural Style (SRE)

An additional style of reasoning identified as important to reasoning practices in English is the structural style (SRE). This considers the structure of a literary text both in terms of ordering across the whole text and in terms of ordering of individual sentences. This can include consideration of how a theme, character or relationship develops across a text, which particularly relates to narrative structures: "structure in narrative fiction is often defined as the planned framework or ordering of images, characters, and episodes at rhythmical intervals" (Rothwell, 1963, p. 603). Within non-fiction, consideration of structure may consider the sequencing of ideas, arguments or text sections across the whole text as well as at sentence-level. It is important to recognise that consideration of structure does not simply involve summarising each chapter according to plot, or each section according to key content. Rather, discussion of structure would include consideration of the ways in which an author develops unity within a text and the means used to synthesise individual elements of their writing.

For narrative writing, several structural devices have been identified as tools used to enhance unity: "continuous narrative; dialogue; narrative viewpoint; setting; repetition and repetitive motifs; working with time; appendices; epilogue" (Childs & Moore, 2003, p. 22). While this list is from an Advanced Level English Literature textbook, it is a useful starting point to illustrate the various devices which may be considered when employing structural reasoning. Given the complexity of consideration of structure, elements are often discussed separately. It would not be possible to consider the ordering of every episode, character, image or gravitation in terms of its effect on the overall unity and 'energy' of a text. Because of this, many texts have been considered according to various elements which work towards the creation of unity. One of the most frequently considered of these aspects is narrative structure. This is for several reasons. Authors throughout history have manipulated and created narrative structures for various reasons and with varying effects. Analysis of such structures is interesting and fruitful to the meaning-making process. Moreover, identifying the narrative structure of texts is relatively straightforward, even when the structures themselves are complicated. This is greatly facilitated by drawing upon simplified models to summarise and represent structures identified which can support understanding and then facilitate explanation. This can be linked to the scientific style of hypothetical construction of models (Crombie, 1995; Hacking, 1992) (see Section 2.6.2). In English, for example, models of narrative structure can seek to explicate the narrative structures employed within a text and are particularly useful for describing complex structures. Yet using these models supports much more than description. Considering the effect of changes in narrative voice is an important means of analysis and interpretation which can be used to support the process of forming conclusions. Considering narrative structure and voice can also help readers to understand how an author has enhanced unity in their writing, through adoption of structural devices.

3.2.4.1   Conflicting terminology

Features of structure identified above and taken from a student textbook (Childs & Moore, 2003) represent more simplified consideration of structure than might occur in the academic culture of English literature. Rothwell's journal article, *Structure in Literature,* suggests that "the mass, or elements, in the literary structure derive…from the syntax of sentences, from the role of the *topoi*

[rhetorical set-pieces], of the historical allusion, of the archetype (to include the variety of predictable character types…)" (1963, p. 607). While demonstrating structural consideration in the domain, parts of these elements allude to other styles of reasoning identified in this project. For example, "historical allusion" links to the contextual style and consideration of "the archetype" may connote the genre-based style. It is therefore important to consider which features make structure, and therefore structural reasoning, distinct.

According to Mayfield, *structure* exists as "a more specialised, subcategory within form" (2010, p. 39). *Form* represents the "unique expression" of a text differentiating it from all other units of text, including, for example, consideration of semantics, style and "other unique elements" (2010, p. 39). Form is differentiated from *genre* which considers the relation of a text to others "so that the unique text requires classification with those other texts in a shared category" (2010, p. 37). Yet while seemingly helpful in terms of delineating definitions of literary terms, these distinctions are not always agreed upon. For example, Campbell conflates form with structure: "'form' is a good English word for the shape or structure of something" (Campbell, 2014, p. 230). Moreover, Blum argues for "a simple elementary distinction: the distinction between the concrete, individual, particular text and the abstract, transindividual pattern of text formation, that is, the 'genre'" (2003, p. 33). Consideration of structure often accompanies discussion about genre and genre-theory. These links are apparent when consideration is reversed: when reading about the importance of structure within literary texts, the term genre is often in attendance. An example is provided by Kusch, in *Why Genre Matters*: "our ability to categorise texts quickly and even subconsciously allows us to associate them with clearly defined patterns of structure and meaning-making" (2016, p. 24). Lack of distinction between key terms is potentially problematic since this project seeks to clearly explicate distinct styles of reasoning within English literature and useful for primary English.

A solution may be found by returning to Mayfield's consideration of terminology. Despite acknowledging differences of opinion in terms of definitions, Mayfield proposes two further categories within *form's* subcategory of *structure*: "genre structure" and "text structure": "in addition to a text's unique structure, every genre has a particular structure that is unique to the genre itself" (2010, p. 43). Considered in this way, this view also partially reconciles with Blum's distinction cited above between the individual text and its genre. While again, this approach is subject to alternative opinions and arguments, it may help towards reconciling the similarities identified between genre and structure while still supporting the capacity to distinguish between

two separate styles of reasoning. By considering *text structure* within the style described as structural reasoning, and *genre structure* within the genre-based style of reasoning, a distinction between the two styles is made. This does not eliminate the possibility of overlaps in usage between the two styles, and the two elements of structure identified by Mayfield, but may help to illustrate the need to provide opportunities for considering unique structures, as well as genre-based structures, when interpreting texts.

Additional limitations of structural reasoning include problems of reductionism. Structuralist theory aims to discover basic units that constitute a given system and the rules which govern how these units can be combined (Klages, 2006). Proponents of this theory have attempted to reduce literature to its skeletal structure and have aimed to establish how all literature shares a structure. In 1928, Vladimir Propp, associated with Russian Formalism, identified thirty-one 'atoms' shared by all folk tales, irrespective of content (Propp, 2015; Harland, 1999). While this may help to establish shared patterns and structures within literary works and specific genres, this may represent a reductive approach to literary analysis, ignoring the complex interaction of content, themes and messages to make meaning which for many, is vital to an understanding of literature (Klages, 2006).

 Limited readings and interpretations may result from solely focusing on one element of a literary text, or merely surface features of structure. This concern is voiced by Rothwell, who earlier provided a list of features combining to represent structure in a literary text:

> In literature as in nature are space (scene), time (the division of episodes, chapters, and acts), matter (the forms of literary experience), gravitation (rising and falling action), and energy (the mysterious reworking of all these elements by the writer). For these reasons, the explication of literary structure in merely linear terms will probably always fall short of furnishing a satisfactory analysis (1963, p. 605).

The tendency to focus on more obvious structural features within a text may reflect competency levels. It may also point to the need for a progressive framework within structural reasoning (already identified as a priority in this project) in order to develop more comprehensive engagement with the ambitions of structural analysis.

Examples of academic engagement with the structural style of reasoning will now be presented.

3.2.4.2 Examples in academic English literature

Anne Brontë's *The Tenant of Wildfell Hall* (Brontë, 1848/2007) is often considered in terms of its interesting narrative structure, which includes a series of letters written by Gilbert Markham to his friend Halford with a lengthy extract from Helen's diary forming the central segment of the novel. In writing which explicates the structural style of reasoning, Gordon argues "it is not the characters of the individual subjects of the novel nor the contents of Markham's narrative that shape the meaning of *The Tenant of Wildfell Hall*, but rather the relative dispensation of alternative narratives competing for our attention and hence for a textual priority" (1984, p. 719). This novel has therefore been explored and interpreted in terms of its narrative structure and academics have explicitly considered the effects that this structure has upon interpretation of the whole text.

A further example of structural reasoning comes from consideration of *Wuthering Heights* (Brontë, 1847/2012)*,* a novel by another Brontë sister, Emily, which also has a complex narrative structure*.* The outer-framing narrator is Lockwood, an outsider, detached from the world described in the novel and with awareness of the world outside of the two major settings, Wuthering Heights and Thrushcross Grange. While Lockwood frequently misunderstands events and characters, his narrative overcomes this to some extent by offering a series of inner narratives from both Heathcliff and Catherine. Nelly provides the main inner-framing narrative. Her involvement as a servant and companion spans the whole period of the novel and she is therefore able to depart from a linear chronological narrative. Nelly's narrative is also complicated through the addition of portions of the narrative reported from the perspective of other characters, Zillah and Isabella. Since both Lockwood and Nelly are "prevented by class, education and personality from a full understanding of the protagonists, [this] produces a radical uncertainty about the central meaning of the experience that all the narrators are trying to make sense of" (Mengham, 1988, p. 73). Mengham therefore demonstrates structural reasoning by considering effects of changing narrative voice upon the reader's interpretation. While Mengham suggests the disunity produced by a complicated narrative structure, this argument can help to make sense of how the various narrative voices produce a unifying effect through careful combination of structural features.

Some critics have acknowledged the structural devices which support their reasoning about *Wuthering Heights,* and others have even criticised an absence of structural consideration in some viewpoints. Thus, Burkhart writes "David Sonstroem, in making his point that Emily Brontë is not endorsing the viewpoint of Heathcliff and Catherine, or of any of her other characters, might well have made greater use of the structure of the novel as supporting evidence, for the structure clearly shows the failure of the Heathcliff-Catherine relationship to dominate the action…" (1972, pp. 104–105). Burkhart sees consideration of narrative structure as significant to interpreting the text and to supporting and justifying conclusions. He goes on to explain:

> a possible conclusion - although it is not the only conceivable explanation - is that the Cathy-Hareton romance of the second generation is not only the structural parallel but also the thematic equivalent to the Catherine-Heathcliff romance of the first generation. Such precision in structure, it seems, must have a relationship to what we make of the novel…
> (Burkhart, 1972, pp. 104-5).

The structural style of reasoning is clearly drawn upon here and is used to explain and then justify the conclusions of the writer. Burkhart identifies the effect of combining various structural elements, including narrative structure, to make sense of the novel in its entirety.

Discussing both *The Tenant of Wildfell Hall* and *Wuthering Heights,* Jacobs argues:

> the narrative structure of both of these novels represents an authorial strategy for dealing with the unacceptability of the subject matter… the framing narrator or fictional editor generally belongs to the world of the reader, and is a conventional and pragmatic sort who is shocked by the gothic evils he encounters (1986, p. 206).

Jacobs concludes that the authors deliberately use a framing narrative structure to deal with socially unacceptable subject matter. This conclusion is justified by Jacobs through explicit reference to the narrative structure of the novel and to the greater freedom in terms of content that this permitted the authors. Again, narrative structure, as an element of structural reasoning, is drawn upon to support interpretations of the novels.

These broad examples of academic engagement with the structural style of reasoning in English literature illuminate and explicate the structural reasoning style identified in this project. Focus will now move to consideration of the use of structure in education, which contributes to the identification of structural reasoning as a reasoning style appropriate to primary English.

Consideration of structure and its components is apparent even from year 1 in the English

Programme of Study. *Comprehension* requirements as part of *reading* state that:

> Students should be taught to: develop pleasure in reading, motivation to read, vocabulary and understanding by:
>
> - becoming very familiar with key stories, fairy stories and traditional tales, retelling them and considering their particular characteristics;
>
> - recognising and joining in with predictable phrases (DfE, 2014, p. 22).

These statutory requirements are elaborated upon in the non-statutory *notes and guidance* section:

> By listening frequently to stories, poems and non-fiction that they cannot yet read for themselves, students begin to understand how written language can be structured in order, for example, to build surprise in narratives or to present facts in non-fiction (DfE, 2014, p. 23).

This demonstrates recognition of the need to teach young students some narrative and non-fiction

text structures, in addition to sentence structures (such as repeated refrains within stories).

Elements of these requirements are also implied in the *writing composition* statements:

> Students should be taught to: write sentences by:
>
> - sequencing sentences to form short narratives (DfE, 2014, p. 25).

While this does not require the same level of knowledge and understanding of structural

components as that indicated in the comprehension requirements, this is expected given that most

children learn to read and understand what they read more quickly than they are able to apply this

to their own writing.

The year 2 Programme of Study also refers to structural elements. *Comprehension* statements

include:

> Students should be taught to: develop pleasure in reading, motivation to read, vocabulary and understanding by:
> - discussing the sequence of events in books and how items of information are related
> - being introduced to non-fiction books that are structured in different ways (DfE, 2014, p. 29).

While sequence here predominantly refers to chronological or time sequencing, by already considering how items are related, students in KS1 are introduced to the concept of unity within texts (although this terminology is probably not age-appropriate). This is reinforced by the *notes and guidance*:

> Students should learn about cause and effect in both narrative and non-fiction (for example, what has prompted a character's behaviour in a story; why certain dates are commemorated annually). 'Thinking aloud' when reading to students may help them to understand what skilled readers do (DfE, 2014, p. 30).

This suggests the importance of considering elements within a narrative which help to achieve a coherent structure (for example, by matching events with subsequent behaviour). *Writing composition* requirements also refer to structural understanding:

> Students should be taught to: consider what they are going to write before beginning by:
>
> - planning or saying out loud what they are going to write about;
> - encapsulating what they want to say, sentence by sentence (2014, p. 32).

Although the writing requirements consider structure mainly at sentence-level, this again reflects the higher levels of understanding which can be reached through reading compared to the comparatively slower development in writing composition skills. The *notes and guidance* information suggests that "reading and listening to whole books, not simply extracts…help [students] to understand how different types of writing, including narratives, are structured" and this understanding "can be drawn on for their writing" (DfE, 2014, p. 32).

Moving into requirements for KS2, those relating to structure in terms of *reading comprehension* are almost identical in years 3-4 and years 5-6. The programme states for both phases:

> Students should be taught to: develop positive attitudes to reading, and an understanding of what they read, by:
>
> - reading books that are structured in different ways and reading for a range of purposes (DfE, 2014, p. 36).

The following requirement is also identical (although the requirement that this be through books students can read independently only applies to lower KS2):

Students should be taught to understand what they read, in books they can read independently, by:

- identifying how language, structure, and presentation contribute to meaning (DfE, 2014, p. 37).

While these statements clearly see a role for consideration of structure, they are vague and given that they are identical for a four-year period, provide no advice to schools in terms of progression. The *notes and guidance* material for each phase (years 3-4 and years 5-6) is also virtually identical. Both phases refer to the importance of knowing how to use contents pages and indexes to locate information in non-fiction. The guidance advises that students "learn the conventions of different types of writing" and provides almost the same examples (e.g. "a diary written in the first person") (DfE, 2014, p. 37 and 46). Lower KS2 guidance also states conventions related to "greeting in letters" and "the use of presentational devices such as numbering and headings in instructions" (DfE, 2014, p. 37), while the upper KS2 advice adds consideration of first person in autobiographies. While this adds something to distinguish teaching and learning of structure between the four year groups, this is still rather limited.

Structural consideration is also indicated in KS2 *writing composition* requirements. The statement associated with planning of writing is similar for lower and upper KS2:

Discussing writing similar to that which they are planning to write in order to understand and learn from its structure, vocabulary and grammar [years 3-4] (2014, p. 40).

Identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own [years 5-6] (2014, p. 48).

While both age groups require students to learn from writing models, the upper KS2 requirements explicitly refer to consideration of audience and purpose when writing. While this would probably appear in lower KS2 teaching too, by explicitly stating this within the requirements for the higher age group, there is evidence of a concern for progression between the phases. The implied difference is that students in years 5-6 will, with increasing independence, consider the context of their writing, including its purpose and intended audience, before drawing upon other writing to support their composition. Students in years 3-4 will not need to demonstrate such consideration, particularly independently.

Progression within the *draft and write* requirements is also evident between the two phases of KS2. Years 3-4 students should be taught to:

> Draft and write by:
>
> - organising paragraphs around a theme
> - in narratives, creating settings, characters and plot
> - in non-narrative material, using simple organisational devices [for example, headings and sub-headings] (2014, p. 40).

Even at the start of KS2, when students are between seven and eight years old, they are already considering various structural devices employed by authors to bring cohesion and unity to their texts. This is particularly developed for narrative structure and this focus is continued in the Programme of Study for years 5-6:

> Draft and write by:
> - in narratives, describing settings, characters and atmosphere and integrating dialogue to convey character and advance the action (2014, p. 48).

In years 5-6, students are therefore expected to consider and create atmosphere and to include dialogue. By specifying that this dialogue should not only advance action, but should also reveal character, the programme requires students to engage with further structural elements employed to unify the whole text. This is stated even more explicitly in later statements within the *draft and write* section:

> - using a wide range of devices to build cohesion within and across paragraphs
> - using further organisational and presentational devices to structure text and to guide the reader [for example, headings, bullet points, underlining] (2014, p. 48).

While non-fiction elements may be easier to understand and employ by students, the need to build cohesion within and across paragraphs also applies to narrative and is a complex skill. Despite the clear consideration of structure within the primary Programme of Study for English, statements are often vague (note the "wide range of devices" without examples) and determining progression, particularly in terms of stages between individual year groups, is difficult.

While structure is clearly recognised as an important component of English within the primary English Programme of Study, this is not so apparent within end of KS2 SAT materials. Of course, these tests assess only some elements of reading within English, while writing composition and other elements of reading are assessed by class teachers. Nevertheless, it is useful to consider where elements of structural understanding may be required in the Reading SAT and how often this might occur (i.e. how many marks this understanding would be worth).

The content domain element most strongly linked with consideration of structure is 2f: "identify/explain how information/narrative content is related and contributes to meaning as a whole" (STA, 2015a, p. 12). The *Reading Test Framework* document (STA, 2015a) produced for test developers suggests that this element should be awarded between 0-3 marks, or 0-6% of the final Reading SAT score. In the 2016 SAT, only one mark was awarded to this component, representing just 0.5% of the final score. Question 22 required students to match parts of a story with quotations from the text (STA, 2016, p. 20). This is not particularly reflective of engagement with structural features used to support unity within a text. Another question in this paper, (number 33), although part of content domain 2c ("summarise main ideas from more than one paragraph" (STA, 2015a, p. 12)), may also demand consideration of structure. This question provides summaries of six paragraphs from a text and asks students to number them to show the order in which they appear in the text (2016a, p. 26). Although sequencing is a low-level element of structural consideration, students must also understand summaries and consider the structure and sequence of the text as whole from these summaries.

Since the new National Curriculum was first assessed in the 2016 SAT tests, the only other source of assessment questions available at the time that analysis for the conceptual enquiry phase of this project took place (2016-17) was the sample Reading test created by the Standards and Testing Agency (STA, 2015b). Again, only one mark, (0.5%), was allocated to content domain 2f. This question (35a) asked students to find and copy a group of words on a particular page where a character's mood changes (STA, 2015b, p. 25). This requires engagement with shifts in terms of atmosphere and emotions. However, students are basically tasked with retrieving where this shift occurs from a given page. More basic consideration of structure is evident in one of the multiple-choice questions within the sample paper, labelled as a retrieval skill. Question 25a asks students to

identify whose perspective the story is told from (STA, 2015, p. 19). This requires students to consider narrative voice, which represents an element of structure. A further question, while not labelled as part of domain 2f, may also require some consideration of structure. Question 36 is labelled as belonging to domain 2e ("predict what might happen from details stated and implied" (STA, 2015a, p. 12)). As will be discussed in Section 3.3.2, prediction (along with retrieval and inference) is identified as a stage of progression within the five styles described in this project. This question asks: "based on what you have read, what does the last paragraph suggests might happen to the explorers next?" (2015, p. 26). A similar question is also asked in the 2016 SAT paper (20) (2016a, p. 18). These require students to consider events of the passage including structural features which combine to create a unified text. Competent answers to the question would consider this unity (although probably not using this term) and align their predictions to what they have read and been led to expect so far. A further question (29) implying the need to reflect upon how texts create unity is labelled as an inference question (content domain 2d). This question provides students with a statement describing iguanodons as "inoffensive brutes". Students are then asked to read a given paragraph and find evidence to support both parts of the statement (2015, p. 22). Students are required to consider how authors provide evidence for their claims using character descriptions, actions and dialogue. This therefore implicitly considers how texts are structured to achieve cohesion and unity.

Most of these questions are found towards the end of the sample paper. Questions generally increase in difficulty as papers progress (STA, 2015a, p. 11). This may suggest that structural consideration is cognitively demanding or that it is difficult to assess (or both). An important point to consider is that the Programme of Study details engagement with structure within writing as well as reading. Thus, while structure may not seem to feature strongly within currently available SAT materials, the Reading SAT represents just one form of assessment used by schools and is mainly required for reporting and accountability purposes (aims which are not shared in this project).

This section demonstrates the prevalence of structural considerations within both academic and primary level English. Consideration of the academic culture of English literature suggests the importance of engaging with structure during reasoning. While this is obviously at a complex level, elements which combine to unify a text are considered by academics in their inferences. Models are also drawn upon to describe structures, such as narrative structures. Consideration of structure is also evident within the primary English Programme of Study. There are references to structural

elements within the *reading comprehension* and *writing composition* requirements from year 1 upwards. A particular difficulty, however, is the lack of detail regarding which specific structural devices should be taught at each stage and there is limited description of how these skills should progress across the primary years, particularly in terms of reading comprehension skills. This lack of precision is also reflected in assessment materials available. A very limited proportion of marks are allocated to questions considering how content is related and contributes to meaning (the content domain statement closest to structural consideration discussed here). Questions are also fairly limited in the requirements that they place upon students to engage with elements of structure and the effects that these have throughout a text. While consideration of structure seems to be an important reasoning skill in English, as identified in the three-pronged analysis undertaken in this project, if adequate assessment materials and specific explanations and indictors of progression are not provided, teachers may encounter difficulties when teaching this style of reasoning.

3.2.5   Analogy-based Style (ARE)

A further style of reasoning identified in this project as important to reasoning practices in English is the analogy-based style (ARE). In simple terms, analogy is defined as "a comparison between one thing and another, typically for the purpose of explanation or clarification" (Lexico Oxford, 2020). Allusions and allegories are contained within the broader term of analogy, as are features more commonly considered as language devices such as simile and metaphor. By drawing attention to similarities between two elements, greater understanding is hoped for. This comparison may see largely dissimilar aspects considered together, which encourages engagement with relationships and connections previously unseen.

The terms 'analogy' and 'analogical reasoning' have specific meanings and implications across domains. Important dimensions include the *base* (the domain in which knowledge is held) and the *target* (the domain onto which knowledge is mapped). The importance of shared relations (between the base and the target) is emphasised, in contrast to shared attributes (which represent superficial similarities according to literature in science) (Brown & Salter, 2010; Genter, 1989; Goswami, 1992). In science education, the importance of analogy is recognised (e.g. Brown & Salter, 2010; Hofstader, 2001). Indeed, the use of analogy is identified by Crombie as one of five scientific styles of reasoning.

In science, emphasis is placed on mapping relational similarities between two domains, for example, consideration of water flowing through a pipe as an analogy for blood flowing in a blood vessel. Relational similarities in this example include consideration of flow, relying on viscosity and diameter of the vessel or pipe (Brown & Salter, 2010). Analogies can support understanding of complicated processes. Nevertheless, Brown and Salter (2010) emphasise the importance of drawing out limits of analogies to students, or the boundaries of relational similarity within an analogy, to permit fuller understanding.

The nature and use of the term analogy differs in literary studies. Comparison between sources, themes, characters, settings and genres represent key components. There may be increased sharing of attributes in analogies based on literature (such as sharing a textual context, e.g. World War Two). Despite the argument that sharing of attributes may lead to identification of superficial similarity, comparisons in literature also seek to identify relational similarities and share the 'cognitive approach' associated with scientific endeavour (Fishelov, 1993). While the term 'analogy' in this thesis does not require fulfilment of demands made in the definition maintained in science, it still aims to capture the process of making comparisons to clarify, make sense of and draw out relationships previously unseen during the reasoning process. At the primary stage, these analogical mappings may be less abstract. Comparisons may be more superficial. Nevertheless, use of comparison and analogy supports students to reach conclusions about a text. Reasons for these conclusions arise during the process of posing analogies and comparing (either between or within texts). Despite some differences in requirements across domains, use of 'analogy' will be maintained in this thesis. As used here, analogy is based on a more widespread understanding of the term and its use, for instance, as defined by Lexico Oxford Dictionaries (above).It is acknowledged that analogy in the sense used in science literature, with concern for relational mappings and limited sharing of attributes, may not be observed in student dialogue. This may represent a function of students' stage of development and does not prevent the possibility of more sophisticated analogies being used to support the process of forming conclusions at later stages of development. It also follows the types and uses of analogy observed in the domain of English literature.

Analogy is commonly used in the domain of English literature although it can draw on a range of sometimes diverse sources for many different purposes. In the process of interpreting a text and forming conclusions, analogies with other literary works are often made. This may be from works by the same author, from a similar historical time period or even from an alternative medium that has

resonance with the specific text (e.g. art, music, historical accounts). Often, the purpose of posing analogies with other sources is to illustrate some underlying theme or issue common to both texts. This can add additional layers to interpretation of a single text. Yet analogies also seek to pose and explore contrasts. They may consider seemingly different viewpoints from a single author or within a similar historical context. This consideration could then be used to explore authorial intentions and to add additional layers of complexity to interpretation.

The importance of elements of analogy within literary theory can be historically traced for over two thousand years. Horace (65 - 8 BCE), a Roman poet, argues that literature should emulate the work of other authors: "a theme that is familiar can be made your own property as long as you do not waste your time on a hackneyed treatment" (Horace, 1972, p. 83). Romans viewed Greek culture and art as superior and therefore took significant inspiration from Greek texts. This introduces the need for authors to be aware of the literary tradition within which they are writing and the various forms that literature has taken. These ideas allude to the analogy-based style in particular and are also of some importance to the contextual and genre-based styles described in this thesis.

3.2.5.1 Examples of analogy-based reasoning in English literature

There are various considerations of analogy within English literature. One form sees consideration of an author's use of analogy within their own literary text(s). This form explores the various images and themes which an author explicitly and deliberately draws upon during the process of constructing their text. An example can be seen in Dickens' choice of character names, explored by Tambling who discusses the choice of name for Quinion and Jegg's yacht, the *Skylark*, in *David Copperfield*. Tambling points to the definition of skylark: "to frolic or play, to play tricks" ("skylark", n.d.). Tambling suggests that "names in Dickens bear marks of the primary process, modifying, for instance, 'slur' as in slurred speech, into Mr Sleary, deforming a more logical 'Flintwint' into 'Flintwinch'. … 'Winch' suggests wincing or kicking or twisting an argument, all strangely appropriate" (2014, p. 189). Hawes similarly argues that "many [names] are brilliant inventions, which suggest through onomatopoeia, connotation or symbol the traits and function of the personage in question: Bounderby, Crisparkle, Nandy, Pumblechook and Scrooge" (2013, p. 4).

An additional form of analogy-based reasoning in English literature is that used when those interpreting a text draw their own analogies rather than considering the analogies an author has explicitly and intentionally used. Of course, there is some blurring between these forms. It is difficult to know whether an author has consciously used analogies or, conversely, that they were unaware of parallels which could be drawn between their work and other sources.

An example of analogy-based reasoning *from* a text, rather than *within* a text, can be seen within the writing of Tambling. Thus, when considering Mr Dorrit's ending, "ladies and gentlemen, God bless you all!", within Dickens' novel *Little Dorrit* (1857/1997), Tambling suggests "it is not difficult to hear Ophelia's 'come, my coach! Good night, ladies, good night' (Hamlet)" (Tambling, 2014, p.3). In fact, Tambling's whole book, *Dickens' Novels as Poetry: Allegory and Literature of the City*, considers the influence of other sources identified within the works of Dickens.

While analogies discussed so far consider comparisons drawn between a literary text and an additional source, comparisons are also drawn within a single text. Many writers deliberately play with themes or characters in opposition: good versus evil, light versus dark, man versus nature, individual versus society, childhood versus adulthood, war versus peace, innocence versus experience, tradition versus innovation, truth versus lies and so on. Levi-Strauss, part of the structuralist movement in literary theory, suggests that the units forming a structure often group in opposing binary pairs. Derrida, associated with ideas of deconstruction, adds to this by claiming that within these pairs, one element will always be positive and the other negative (Klages, 2006). While these opposing forces (or structures) are often subtly woven throughout a text, through presenting characters or themes representing opposing forces or positions, a writer, and subsequently a reader, can use analogy to explain or clarify. (While these opposing pairs are considered as part of analogy-based reasoning, elements of this discussion could also be considered within the structural style, where the pairs represent structural units. These pairs are predominantly discussed within this style since analogy focuses on comparison and by presenting opposing factors, readers are invited to make such comparisons in the process of meaning-making).

Examples of academic engagement with analogy-based reasoning in English literature help to explicate the analogy-based reasoning style identified in this project. Focus will now move to

consideration of the use of analogy in English education, which contributes to the identification of analogy-based reasoning as a reasoning style.

The Programme of Study for English at primary level makes several references to the importance of analogy (although not using this term). The *notes and guidance* section of the years 3-4 *comprehension* requirements suggest that "students should be taught to recognise themes in what they read, such as the triumph of good over evil…" (DfE, 2014, p. 37). This clearly resonates with discussion of analogy within texts through employment of opposing themes. A focus on teaching students to be able to compare, a fundamental element of analogy-based reasoning, begins in the years 5-6 section of the Programme. There is a statutory requirement to teach students to "maintain positive attitudes to reading and an understanding of what they read by: making comparisons within and across books" (2014, pp. 44-45). The programme thus clearly identifies the importance of these comparisons to enhancing understanding of what students read. The statutory statement is elaborated upon in the non-statutory *notes and guidance*:

> They should have opportunities to compare characters, consider different accounts of the same event and discuss viewpoints (both of authors and of fictional characters), within a text and across more than one text.
>
> …Students should be shown how to compare characters, settings, themes and other aspects of what they read (2014, p. 46).

These requirements have several implications for teaching. The first part of the statutory requirement (making comparisons *within*…books) points to the importance of developing a deeper understanding of a text by considering contrasts and comparisons between aspects within an individual text. This is elaborated upon in the second part of the *notes and guidance* quotation above. Thus, activities such as character comparisons are important. These often draw upon characters with fundamental differences (e.g. the protagonists within Mark Twain's *The Prince and the Pauper* (1881/1979)) or those embodying alternative themes (such as good versus evil often explored in fairy tales). Settings are another rich source for comparisons. While considering differences between descriptions of the physical setting can be revealing, as students develop understanding throughout the primary years, many are able to consider different emotions

associated with particular settings, or themes attached to contrasting settings, which can enhance their understanding of a literary text. For example, comparing the Welsh countryside setting Carrie and her brother are evacuated to in Nina Bawden's *Carrie's War* (1974), which comes to represent home for the siblings, to the harsher setting of a bombed London, complicated by its associations with their mother and early childhoods, can help students to explore important themes within the text.

While there is clearly an expectation that students in upper KS2 compare elements within texts, the statement also points to the need to make comparisons *across* books. The *notes and guidance* quotation above points to possible ways in which this aim can be addressed. Thus, while characters can and should be compared within a text, characters should also be compared across texts. This might be achieved by comparing versions of the same literary character from different publications. For example, the fairly meek Little Red Riding Hood of Grimm's fairy tale is somewhat different to the version who "whips a pistol from her knickers" before swapping her traditional cloak for "my lovely furry wolf-skin coat" in Roald Dahl's *Revolting Rhymes*! (2001).

A further important means of comparing across texts is suggested in the *notes and guidance*: "consider different accounts of the same event" (DfE, 2014, p. 46). While this has been explored with interesting effects *within* texts (such as in Konigsburg's *The View from Saturday* (1996)), there is also scope to compare different texts. This can be achieved by comparing texts based upon their portrayal of a historical event, (e.g. Nina Bawden's *Carrie's War* compared to Michelle Magorian's *Goodnight Mister Tom* (1981) or Michael Morpurgo's *Friend or Foe* (1977)), or perhaps by considering different versions of a similar event (e.g. desert island stories like Michael Morpurgo's *Kensuke's Kingdom* (1999) compared to Daniel Defoe's *Robinson Crusoe* (1719/2007)). These comparisons can be inventive and can be relatively easily accommodated in the curriculum, particularly if schools plan to explore topics over a period of time. By identifying similarities and differences between texts, students are encouraged to consider the reasons for authorial choices. For example, Roald Dahl's Red Riding Hood may encourage students to consider alternative versions of popular fairy tale characters and ask them to question the 'truth' within earlier portrayals. Of course, subversions like these are also engaging and encourage a love of reading and language. Comparisons should also enhance student understanding. For example, considering World War Two texts can help to enhance historical knowledge, but also develop a more nuanced appreciation of the situation. Morpurgo's *Friend or Foe* sees two young evacuees discover two injured German

soldiers in the Devon countryside. The boys wrestle with their conflicting feelings towards the men and the text invites readers to consider moral and ethical issues. *Carrie's War* and *Goodnight Mister Tom* also question somewhat simplistic assumptions that children would hate to be separated from their families and homes. While these comparative suggestions are not fully explored here, they serve to illustrate the many opportunities for and benefits of, posing analogies with students.

3.2.5.3   Analogy within KS2 assessment materials

Although the Programme of Study requires students to make comparisons "within and across books" (DfE, 2014, pp. 44-45), only the first half of this is assessed in the Reading SAT. Content domain 2h: "make comparisons within the text" (STA, 2015a, p. 7) requires analogy-based reasoning, yet this is limited to those analogies within a given text. The most likely reasons for this narrowed focus is the limited space within SAT materials to offer texts with fairly obvious analogies (eleven-year-old children would probably need texts which offer easily-determinable comparisons given the difficulty of the skill and style of reasoning and the amount of reading that would be entailed in timed conditions). The Reading SAT usually presents students with three texts and to adequately assess across content domains, is usually comprised of a mixture of narrative, non-fiction and poetry texts. Presenting readily comparable texts is difficult for test developers and SAT materials are unable to assess the whole Programme of Study which means that students' ability to compare across texts is left to teacher assessment judgements.

In terms of comparing within texts, the Standards and Testing Agency suggest allocating this element between 0-3 marks, representing 0-6% of the final score (2015, p. 12). In the 2016 SAT, no marks were allocated to this element although the Agency indicate that while coverage will differ in individual years, it will even out over time. The sample test produced in 2015 does allocate one mark to this domain (question 35b). This question asks students "how does Lord John's mood change?" (STA, 2015b, p. 25). To gain the mark, students are required to compare the character's mood at the beginning and at the end of the extract to describe the change or difference.

Another question (28) asks students to read a paragraph where a character compares iguanodons to different animals. The question asks: "how do these comparisons help the reader understand what the iguanodons look like?" (2015b, p. 20). Although this is marked as belonging to content domain 2d (inferential understanding), students are required to engage with an author's deliberate use of comparison and attempt to understand the effects that this achieves.

While the two questions above do require consideration of comparison, they do not demand the use of analogy within the fuller sense described above. They do not necessitate going beyond a text to other sources; restricting focus to comparisons within a text is rather limited. However, in keeping with the definition of analogy provided at the start of this section, these questions and the focus on comparisons within a text, do still seek to offer comparisons, "typically for the purpose of explanation or clarification" ("analogy", n.d.). Comparing the changing emotions of a character should help students to understand the reasons for this change and recognise the wide spectrum of emotion within humans. By also considering the effects of an author's explicit use of comparison, students should see the advantages of such contrasts, in terms of the clarificatory uses they can serve (such as enhancing descriptions of the iguanodons).

While only a few questions are explored here, it must be remembered that formal assessment requirements changed for SAT tests following the introduction of the new National Curriculum in 2014 (assessments reflected this change from 2016). It is worth noting that up to and including the 2013 Reading SAT, at the end of the question paper were questions asking students to consider the whole reading booklet. This intended to invite comparisons between the texts provided, in terms of their content, intended audience and purpose, structure, language and so on. Many of these questions did not really require the use of comparison in the sense that it is discussed here. Often, these end of booklet questions would simply require students to retrieve or allocate information from more than one text, rather than explicitly comparing them (e.g. question 28 in the 2013 SAT; question 33 in the 2012 paper). Despite this, some of the questions did invite students to engage with comparison. Question 29 in the 2013 paper asked students to match specific texts provided in the reading booklet to "the type of reader who might most enjoy it" (STA, 2013, p. 30). This required students to consider and compare intended audiences of texts. Thus, while the current end of KS2 Reading SAT may not require use of analogy to a large extent, at least across texts, this does not mean that future assessment materials will not make greater use of this skill. It is also important to

emphasise that teaching and learning should not narrowly focus only on what is readily testable. Reasoning and particularly different styles of reasoning is a much more complex skill and practice which SAT papers could not easily assess.

3.2.6   Contextual Style (CRE)

A further style of reasoning identified as important to English is the contextual style (CRE). The contextual style draws upon consideration of contextual factors to explain, argue and support the formation of conclusions about a literary text. Contextual factors could include aspects such as historical, biographical, social, cultural, political, religious, moral and economic considerations. De Keyser and Vandepitte (1998) suggest three frames of reference to support historical contextualisation: *chronology*, drawing upon knowledge of significant events and time periods; *spatial*, considering locations; and *social*, including economic, political and cultural societal factors. Wineberg (1998) also considers different factors involved in consideration of context in his research into how expert historians construct a historical context. He identifies types of comments drawn upon: *spatio-temporal* (physical location and time sequence of events); *social-rhetorical* (social demands, ideological landscapes); *biographic* (information about specific life histories); *historiographic* (drawing on the body of historical writing); *linguistic* (particular historical meanings of language); and *analogical* (explicitly comparing with other periods in history) (Wineburg, 1998). Such attention to contextual factors can be used to support the explanation-building and meaning-making processes involved within disciplinary-based reasoning in English. It can be used to explore key themes or issues raised in a text and can also facilitate a reading of a text considering it from its own time and context. This may help to prevent anachronistic misinterpretations. By considering contextual issues, works can be considered as part of their social milieu, within the zeitgeist or spirit of the age in which they were written (Gill, 2006, p. 288), rather than as existing in a vacuum. This can enrich interpretation and support the reasoning processes.

A focus on context within textual interpretation is evident in the values of *new historicism* and *cultural materialism*. Briefly, commonalities between the two approaches include the belief that:

> Subjects cannot transcend their own time but live and work within the horizon of a culture constructed by ideology, by discourses. The ideological constructions that authors live in,

and have internalised, inevitably become part of their work, which is therefore always political and always a vehicle for power (Bertens, 2001, p. 185).

Within these approaches, both literary and non-literary texts were considered in conjunction in order to enrich understanding of the context within which these texts were constructed.

Although considering reasoning in the academic domain of history, it is possible to apply reasons for the importance of contextual reasoning identified in van Drie and van Boxtel's framework (2008) to other domains. They argue that:

> Understanding and interpreting historical events and acts of persons also requires knowledge of the specific historical context, which is formed by the characteristics of the time and place of the event. It requires finding the appropriate historical context and, then, interpreting the phenomenon in accordance with that context (van Drie & van Boxtel, 2008, p. 95; Halldén, 1997).

This has clear parallels with the demands of contextual reasoning in English literature. The "historical events and acts of persons" discussed can readily translate to those depicted in literature involving characters, and specific contextual knowledge can therefore similarly support interpretation of literary phenomena. Although the subject of history may initially conjure images of a factual, objective reality as opposed to the fictional worlds depicted in literature, this oversimplifies the matter. Indeed, Wineberg discusses the "creation" of historical contexts referring to *contextere* or *contexus* in Latin which means to weave together (1998; van Drie and van Boxtel, 2008). This is reminiscent of the process of interpretation in English literature: a range of factors combine and weave together to add meaning and enhance understanding of fictional works.

While here contextual reasoning is considered as an independent style, as previously discussed, several of the identified styles may be drawn upon at any given point within the reasoning process. For instance, historical or context-specific uses of language can be considered and explored which has clear links to the language-based style of reasoning. Moreover, contextual reasoning promotes consideration of parallels and contrasts with other literary or artistic works from a given (or contrasting) period which clearly resonates with the analogy-based style. The focus of the reasoning, and the specific way in which conclusions are formed, may help to indicate which style is drawn upon most heavily. For instance, if effects of linguistic choices are considered and used to guide interpretation, the language-based style might most usefully capture such reasoning. In contrast, if conclusions are formed by making explicit use of comparison and contrast, this might indicate analogy-based reasoning. Within the contextual style of reasoning, specific engagement with

contextual issues which support interpretations and conclusions made about a text would be required.

3.2.6.1   Opposition to contextual consideration

Despite evidence of the prominence of contextual reasoning (illustrated in examples shared below), there is some opposition to this method of literary interpretation. Ellis asks whether it is possible to infer an author's intentions from knowledge of their biographical context, from considering an author's comments on their own texts (as in the example of Miller's statements regarding *Death of a Salesman* provided below), or from their general concerns with particular kinds of things and situations (1974, p. 108). While Ellis recognises consensus surrounding the importance of authorial intent and biography, he also identifies a point in which this is seriously questioned. Thus, the *intentional fallacy* of Wimsatt and Beardsley (1946) suggests the elusive nature of authorial intent, perhaps even to authors themselves. Ellis argues that to reduce consideration of literature to 'explanations' provided by biographical and/or local historical knowledge is to reduce the text to something that is no longer literature: "the literary value of the text resides precisely in the fact that this limited social situation was outgrown" (1974, pp. 136–137); "these texts are defined as those that outgrow the original context of their utterance, and which function in the community at large" (pp. 111-112). Despite this argument, Ellis recognises the value of "being initiated into the community within which the literary text is literature". He includes in this community knowledge of "social and linguistic conventions" (1974, p. 146). While there may be disagreement among academics regarding the importance of using biographical and historical contextual information to interpret a text, most academics, including Ellis, recognise the value of considering more general shared social experiences and meanings when analysing literature: "we can footnote topical allusions and sketch 'background', but *context does not determine meaning*. Context can merely help us judge possible meanings for various interpreters" (Hume, 1999, p. 36). Whether this is a valuable or appropriate strategy is perhaps an unnecessary question for the purpose of identifying styles of reasoning in English literature here. Since contextual reasoning (sometimes in a specific and sometimes in a broader sense) is a common style that can be observed in the academic community, it is necessary to include it here in order to begin the process of explicitly educating young children into the community of 'experts'.

It is possible to identify authors who sought to locate their works in a given context thus explicitly providing some possible means of interpreting their texts. The titles of Dickens' *Hard Times, for These Times* (1854) and Trollope's *The Way We Live Now* (1875/1992) acknowledge the particularity of historical time periods. Weller suggests these titles "imply a consciousness…of how the present differs from the past. Both continuity and change are presumed to be subjects of investigation for the sake of understanding the world in its current totality of relations" (2012, p. 295). Moreover, considering the contextual background in which Dickens' *Bleak House* arose, Weller points to a survey considering Manchester's working-class housing: "in such dwellings only a physically degenerate race, robbed of all humanity, reduced physically and morally to bestiality, could feel comfortable and at home" (Engels, 1968, p. 100). This, for Weller, provides a contextual background to *Bleak House*: "Dickens shares the discursive indignation of Engels, and is responsive to the same facts" (2012, p. 297). In addition to Dickens' own focus on context to support the construction of his narrative, Weller, representing an academic expert in literature, draws upon contextual reasoning to support his own conclusions and interpretations.

This style of reasoning has been applied to consideration of Arthur Miller's *Death of a Salesman* (1949). In an introduction to the play, Abraham suggests that "Miller portrays the impact of the industrial word on human relationships in which technology overrides it, altering values and even language" (2011, p. xxvi). This is supported by reference to a passage from the primary text:

> Willy: What's that Howard?
>
> Howard: Didn't you ever see one of these? Wire recorder.
>
> Willy: Oh. Can we talk a minute?
>
> Howard: Records things. Just got delivery yesterday. Been driving me crazy, the most terrific machine I ever saw in my life. I was up all night with it (Miller, 1949, p. 59).

The academic draws upon knowledge of contextual factors and supplements this with reference to the primary text to arrive at reasoned conclusions.

Focus will now move to consider the presence (or possibly absence) of consideration of contextual factors in curriculum materials. This is important since the three-pronged analysis undertaken in the

conceptual enquiry phase of this project requires consideration of such materials to classify reasoning practices as reasoning styles.

3.2.6.3   Context in the English Programme of Study

Consideration of the context in which a text was written, or the context evoked by a setting described in a text, is evident from as early as KS1 in the Programme of Study for English. Aims identified for *reading* at KS1 state that:

> good comprehension draws from linguistic knowledge (in particular of vocabulary and grammar) and on knowledge of the world… All students must be encouraged to read widely across both fiction and non-fiction to develop their knowledge of themselves and the world they live in…" (DfE, 2014, p. 15).

In addition, aims identified for *writing* state: "effective composition…requires clarity, awareness of the audience, purpose and context…" (2014, p. 16). These aims reflect the need to engage with contextual features influencing texts that children read and what they then write. Of course, this is at a basic level, given the age of the students, but consideration of audience, purpose and context are nevertheless important even from the first year of formal education. The years 1 and 2 *comprehension* requirements state that students should be taught to "understand both the books they can already read accurately and fluently and those they listen to by: drawing on what they already know or on background information and vocabulary provided by the teacher" (2014, p. 22 and p. 29). While the importance of using prior knowledge to enhance understanding of a text is established, it is also recognised that teachers have an important role in providing appropriate background information. This is particularly important given the age of KS1 students and given their hugely varied experiences and knowledge bases. The *notes and guidance* for year 2 *comprehension* requirements elaborates on this requirement: ""students should monitor what they read, checking that the word they have decoded fits in with what else they have read and makes sense in the context of what they already know about the topic" (2014, p. 30). While this can be understood in terms of decoding accurately based on the context of what is being read, it also establishes a role for knowledge of topics. This is explicated in the statement "…good comprehension draws…on knowledge of the world" (2014, p. 15).

The *writing composition* requirements for year 2 also draw upon contextual knowledge. The Programme states that students should be taught to:

Develop positive attitudes towards and stamina for writing by:
- writing narratives about personal experiences and those of others (real and fictional)
- writing about real events (DfE, 2014, p. 32).

These statements require that students engage with real events when composing their own writing. These events will therefore provide a context for their writing. Although the second statement may cover non-fiction writing about real events (such as recounts of educational visits), the first statement explicitly requires that narrative writing should draw on real experiences.

The KS2 Programme of Study does not reference context as explicitly as it does for KS1. The years 5-6 *comprehension* requirements indicate that students should be taught to "understand what they read by: checking that the book makes sense to them, discussing their understanding and exploring the meaning of words in context" (DfE, 2014, p. 45). Again, this may apply to accurate decoding based upon the context of a setting, but surely, at upper KS2, suggests more than this. Yet despite indicating the need to consider context, this statement is limited in terms of what it requires mainly in terms of language understanding. Despite the lack of explicit consideration given to context within the KS2 programme, it is important to note that the KS1 programme should be reinforced and revisited throughout the primary years. The framework for the end of KS2 Reading SAT test also indicates: "consolidation of the key stage 1 material is assumed within the key stage 2 Programme of Study and therefore material from key stage 1 may appear within the key stage 2 test" (STA, 2015, p. 11).

3.2.6.4   Context within KS2 assessment materials

Some of the other styles of reasoning identified for English align fairly closely to the content domains for the KS2 reading curriculum (such as the language-based style, the analogy-based style and, to some extent, the genre-based and structural styles). However, despite the Programme of Study establishing a need for consideration of context, particularly in KS1, this is not reflected in the eight content domains for reading. While this may seem to limit the role of context in the curriculum, several things should be remembered. Firstly, the end of KS2 Reading SAT can only assess a limited

portion of the curriculum, typically favouring aspects which are relatively straightforward to externally assess. Since SAT materials cannot assess students' background knowledge of various contexts, partly for reasons related to fairness and accessibility to all students, questions which require students to draw upon consideration of context in their thinking and reasoning may not be appropriate. Secondly, context in the curriculum is also considered in terms of writing, which the Reading SAT is not charged with assessing. Thirdly, although some of the content domains seem to align to some extent with the reasoning styles identified, the content domains themselves were not designed to represent different ways of reasoning and, as will be discussed later in the chapter (Section 3.3.2), often represent stages of progression within the styles.

Since some of the content domains represent stages of progression within individual styles of reasoning described in this project (such as the skills of retrieval and inference), some example questions can be identified which require consideration of context. Question 28 of the 2016 Reading SAT claims to assess content domain 2b (retrieve and record information) yet may also require students to engage with the context in which the texts exist. This question asks why artists' drawings from the time of the dodo were not always accurate. To achieve the mark available, students needed to mention that artists: had not seen the dodo, were not scientists/natural historians or aimed to make pictures attractive rather than accurate. While the answers, as the content domain suggests, can be retrieved from the text, students are still engaging at some level with consideration of context, in terms of the context in which pictures were produced and in which artists worked. The sample paper also includes questions requiring some concern with context. Question 1, as part of the inferential content domain 2d, asks why space tourism is impossible for most people. The answer indicating its high cost can be inferred from the text but still encourages students to engage with the context surrounding space tourism. Question 6, also part of domain 2d, asks how a character's trip into space made history. The answer that she was the first female tourist in space could be inferred from the text but may have prompted students to further consider this character's trip within the wider context and history of space tourism. These questions do not ask students to independently identify and then draw upon context (e.g. historical, economic) when answering questions since tests cannot favour those who might possess more contextual knowledge. While students are not independently identifying the context and reasons for space travel being impossible for most, this style of reasoning is still encouraged through the processes of retrieval and inference from the text.

3.2.7 Language-based Style (LRE)

An additional style of reasoning identified as important in English draws upon consideration of language and linguistic devices (LRE). Academics examine language features and rhetorical strategies to facilitate their interpretation of a text, or elements of it. Grammatical and literary features could include consideration at word level in terms of vocabulary, word class features, repetition, onomatopoeia, and alliteration, among others. Sentence-level consideration may be evident in analysis of syntactical structures, use of rhetorical questions, pun, hyperbole, oxymoron, simile, or figures of speech. Analysis may also go beyond consideration of single sentences to consider language features commonly exercised in a broader space. Text-level features may focus on emotive language, personification, pathetic fallacy, metaphor, imagery, symbolism, or irony.

Different approaches to literary criticism call for varying levels of focus on language. Briefly, *historicism* considers literature as part of, and embedded within, the historical culture in which it was written (see Section 3.2.6). The wave of *ahistoricism* in response to objections about the historicist prominence in literary analysis can be seen in the *formalist* approach to literature, associated with Russian Formalism and extending into the New Criticism movement in England and America in the 1920s. These approaches view literature as "an object in its own right…[This] insular disposition…betokens a retreat from history and biography, effectively isolating the literary artefact from both broad social forces and the more localised and personal circumstances of its author" (Kharbe, 2009, p. 299; Arnold, 1864/1993). New Criticism, dominating literary criticism from the 1930s-1960s, argued for the importance of analysing only what is contained within a text, through a process of close reading. It was believed that this could help to enhance the objectivity of literary study, to thus heighten its authority and position within the curriculum (Klages, 2006). Arnold's conception of 'culture', defined as "the best that has been thought and said in the world" (1869/2006), supports the argument that literature, although to some extent reflecting the time and place in which it was created, transcends its historical context. Although necessarily brief, this discussion demonstrates polarised views about how literature should be studied, from a text-centred (as in New Criticism; focuses on the actual writing rather than the author or the reader), author-centred (concerned primarily with texts as reflections of authors and their biography) or reader-centred approach (concerned with the experiences of individual readers) (see e.g. Bonnycastle, 2007; Harker, 1988). Despite this polarisation, many approaches do allow for a position of compromise between consideration of historical context, reader responses and close analysis of

features of the text itself. In much literary analysis, language and linguistic elements are commonly used to support the reasoning process.

3.2.7.1 Examples of language-based reasoning

Cleanth Brooks is a key figure in the history of New Criticism. He shares his beliefs regarding how literature, and particularly poetry, should be judged:

> There is surely a sense in which anyone must agree that a poem has a life of its own, and a sense in which it provides in itself the only criterion by which what it says can be judged (Brooks, 1992, p. 12).

In his analysis of Marvell's "Horatian Ode", Brooks (1992) attends to various linguistic features. He analyses many of the individual word choices within the poem proposing suggestions for alternative or nuanced meanings:

> This complexity [of attitude towards Cromwell] is reflected in the ambiguity of the compliments paid to him. The ambiguity reveals itself as early as the second word of the poem. It is the 'forward' youth whose attention the speaker directs to the example of Cromwell. 'Forward' may mean no more than 'high-spirited', 'ardent', 'properly ambitious'; but the New English Dictionary sanctions the possibility that there lurks in the word the sense of 'presumptuous', 'pushing' (Brooks, 1992, p. 16).

Brooks also draws attention to the use of negatives, metaphor (as in the suggestion that Cromwell exists as "an elemental force" (Brooks, 1992, p. 18) within the poem), simile, analogy, irony, ambiguity and change in grammatical person, in addition to his extensive focus on the words, lines and stanzas themselves. While this may represent a somewhat extreme example of embracing the importance of language during the reasoning process within English literature, this is unsurprising given Brooks' identification with the movement of New Criticism, which still has some resonance today.

Although much literary analysis considering language and linguistic features does not adopt such a rigid, ahistorical approach to understanding, it is common for critics to draw upon language to support their reasoning. While Whitley's analysis of Carol Ann Duffy's poetry for children does not explicitly state one particular framework within which the texts are analysed (i.e. text-, author-, or reader-centred approaches), he does consider the poetry as a collection, implying concern for biography, and also considers the interpretations held by different readers. For instance, in his analysis of the differential connotations of the word 'private' for child and adult readers. While these

suggest author- and reader-centred approaches to analysis, there is also considerable attention given to the language of individual poems. For example:

> The closing metaphor of 'an absolute scream' [in the poem *Little Ghost*) wittily deploys a clichéd phrase denoting hilarious performance to release a buried literal meaning; the 'scream' as response to horror or excitement in its fullest or purest form. This pun encapsulates a quality central to the whole performance of the poem: a fluidity of tone and movement between jokiness and evocative feeling whose range is exceptionally wide. The suggested provenance for this ghost child within film, moreover, relates the funny, sad horror of the poem explicitly to children's experience of this popular medium. Even the accompanying colloquial phrases are drawn from children's stock responses to contemporary examples of the horror genre they enjoy. 'Scary. Spooky. Totally freaky', the little ghost intones earlier in the poem, both sharing and provoking the child reader's response in a mode that involves not a little self-reflexive irony" (Whitley, 2007, p. 108).

Whitley here draws upon analysis of vocabulary ("scream") in terms of its literal meanings but also considering its existence as a pun, its connotations, and its allusions to genre. These linguistic qualities are used to consider meaning within the poem and support Whitley's analysis that the performance of the poem ranges fluidly from "jokiness to evocative feeling".

Examples of academic engagement with language-based reasoning in English literature help to demonstrate the language-based reasoning style identified in this project. Focus will now move to consideration of the focus on language in primary English, which contributes to the identification of language-based reasoning as a reasoning style.

3.2.7.2   Language in the English Programme of Study

Consideration of language and its effects is a significant feature of the Programme of Study for English, even from the earliest stages in primary education. The overall *reading* aims for the programme state that "…good comprehension draws from linguistic knowledge (in particular of vocabulary and grammar)" (DfE, 2014, p. 15). The aims specified for *spelling, vocabulary, grammar and punctuation* indicate:

> As vocabulary increases, teachers should show students how to understand the relationships between words, how to understand nuances in meaning, and how to develop their understanding of, and ability to use, figurative language. They should also teach students how to work out and clarify the meanings of unknown words and words with more than one meaning… (DfE, 2014, p. 16).

These aims indicate a need to develop students' vocabulary and capacity to determine meanings of unknown words yet require much more than this. Students should be taught to explore relationships between words. The aims also indicate the need for students to consider subtle differences in word meaning (according to context for example) as well as explicitly requiring an understanding of figurative language (language which departs from literal meanings).

There are numerous references indicating the importance of language within the Programme of Study. The year 1 *comprehension* attainment targets require students are taught to:

> Develop pleasure in reading, motivation to read, vocabulary and understanding by:
> - recognising and joining in with predictable phrases
> - discussing word meanings, linking new meanings to those already known (DfE, 2014, p. 22).

The *notes and guidance* section suggests that:

> Through listening, pupils also start to learn how language sounds and increase their vocabulary and awareness of grammatical structures. In due course, they will be able to draw on such grammar in their own writing (DfE, 2014, p. 23).

The year 2 *comprehension* requirements are broadly similar with the addition of "discussing their favourite words" (DfE, 2014, p. 29). The *notes and guidance* also encourage focus on morphology to "work out unknown words" (DfE, 2014, p. 30).

When students move into lower KS2, the Programme suggests:

> Teachers should…be consolidating students' writing skills, their vocabulary, their grasp of sentence structure and their knowledge of linguistic terminology. Teaching them to develop as writers involves teaching them to enhance the effectiveness of what they write as well as increasing their competence (DfE, 2014, p.34).

There is a growing concern by KS2 with consideration of language and linguistic features in reading and to enhance writing. There is also focus on language and its variations according to differences in audience and purpose:

> In years 3 and 4, students should become more familiar with and confident in using language in a greater variety of situations, for a variety of audiences and purposes, including through drama, formal presentations and debate (DfE, 2014, p. 35).

The years 3-4 *comprehension* requirements move from considering "favourite words" (DfE, 2014, p. 29) in year 2, to "discussing words and phrases that capture the reader's interest and imagination"

(DfE, 2014, p. 37). There is some evidence here of awareness of the need for progression when considering language between the primary key stages. Students should also be taught to:

> Understand what they read, in books they can read independently, by:
> - checking that the text makes sense to them, discussing their understanding, and explaining the meaning of words in context
> - identifying how language, structure, and presentation contribute to meaning (DfE, 2014, p. 37).

These aims are virtually identical to the requirements for years 5-6 although additional elements are added in the later phase.

The *writing composition* requirements for lower KS2 also demonstrate a concern with language. Students should be taught to plan writing through considering example texts and learning from its "structure, vocabulary and grammar" (DfE, 2014, p. 40). They should draft and write by "progressively building a varied and rich vocabulary and an increasing range of sentence structures" (DfE, 2014, p. 40). Students should also learn to evaluate and edit by "proposing changes to grammar and vocabulary to improve consistency…" (DfE, 2014, p. 40). Both the reading and the writing elements of the Programme of Study therefore require engagement with language and linguistic features. While writing attainment targets hope to improve the effectiveness of students' own compositions, reading targets aim to encourage students to consider particular language choices which make the texts that they read effective (including in terms of how they enhance meaning).

Requirements for upper KS2 are similar to those discussed for lower KS2. Additional requirements include a focus on etymology and an increased engagement with morphology (root words, prefixes and suffixes) when understanding the meaning of new words. An additional *comprehension* requirement is also noteworthy: "students should be taught to: discuss and evaluate how authors use language, including figurative language, considering the impact on the reader" (DfE, 2014, p. 45). This demands consideration of deliberate authorial linguistic choices and the effects that these have. Students in years 5-6 should also "be taught the technical and other terms needed for discussing what they hear and read, such as metaphor, simile, analogy, imagery, style and effect" (DfE, 2014, p. 46). Requirements in terms of understanding are, as would be expected, growing in sophistication across the year groups.

Additional elements engaging with language consideration in *writing composition* requirements are also worth noting. Thus, students should be taught to "draft and write by: selecting appropriate grammar and vocabulary, understanding how such choices can change and enhance meaning" (DfE, 2014, p. 48). In addition, they should "evaluate and edit by: proposing changes to vocabulary, grammar and punctuation to enhance effects and clarify meaning" (DfE, 2014, p. 48). Again, these attainment targets demonstrate increased sophistication in terms of understanding of language and its effects. Students are not simply required to include a range of sentence structures and enhance consistency within their writing, as in lower KS2, they must now consider choices which enhance meaning and effect.

In addition to the year group/phase specific attainment targets discussed above for *reading comprehension* and *writing composition*, there are also specific *vocabular, grammar and punctuation* requirements for each year group, within the broader *writing* section of the Programme of Study. Here, specific concepts and terminology are introduced at each stage/year group and requirements are accompanied by an Appendix (2) explicitly detailing the word-, sentence- and text-level features to be taught within each year group as well as the specific punctuation and terminology students should know. Briefly considering the terminology to be taught within each year group broadly demonstrates the expected teaching and learning. Thus, students should understand and be able to use the following terms in each year group:

> Year 1: letter, capital letter word, singular, plural sentence punctuation, full stop, question mark, exclamation mark;
>
> Year 2: noun, noun phrase statement, question, exclamation, command compound, suffix adjective, adverb, verb tense (past, present) apostrophe, comma;
>
> Year 3: preposition, conjunction word family, prefix clause, subordinate clause direct speech consonant, consonant letter vowel, vowel letter inverted commas (or 'speech marks');
>
> Year 4: determiner, pronoun, possessive pronoun adverbial;
>
> Year 5: modal verb, relative pronoun relative clause parenthesis, bracket, dash cohesion, ambiguity;
>
> Year 6: subject, object active, passive synonym, antonym ellipsis, hyphen, colon, semi-colon, bullet points (DfE, 2014, pp. 76-80).

While there is not space to unpick each of these terms here, a brief glance reveals the complexity of language and linguistic terms which students are exposed to from an early age. Indeed, Appendix 2 of the Programme states that "explicit knowledge of grammar…gives us more conscious control and choice in our language" (DfE, 2014, p. 75). While there is debate regarding the need to teach linguistic terminology at this early stage (Centre for Research in Writing University of Exeter, 2016; Crystal,

2013; Rosen, 2015; TES, 2016), it is evident that the Programme engages with the importance of language and linguistic features within English education. The influence of research by Debra Myhill and colleagues (e.g. Jones, Myhill, & Bailey, 2013; Myhill, Jones, Lines, & Watson, 2012; Myhill & Watson, 2014), which emphasises the importance of embedding grammar teaching within meaningful writing contexts, also adds to support for a focus on language as part of reasoning in English. (Myhill was also instrumental in the creation of the Grammar Annex within the National Curriculum). Such engagement provides support for the classification of language-based reasoning as a reasoning style important in primary English.

3.2.7.3 Language consideration within KS2 assessment materials

Given the prominence of language and linguistic consideration in the Programme of Study, it is unsurprising that language features represent an important element within end of KS2 assessment materials. While *writing*, *speaking and listening,* and some elements of *reading* are assessed in schools by teachers, the Reading SAT is externally marked. Two of the content domains for reading reflect consideration of language. 2g aligns most closely to the language-based style of reasoning discussed here: "identify/explain how meaning is enhanced through choice of words and phrases" (STA, 2015a, p. 7). This recognises the role of language in meaning-making and thus supports its importance during the process of forming conclusions. Domain 2a also reflects a concern with language: "give/explain the meaning of words in context" (STA, 2015a, p. 7). While this focuses more on strategies such as considering the context of the sentence and the broader text when decoding and interpreting unknown words, it may also consider nuances involved within language choice.

The 2016 SAT allocated only two marks (4% of the total) to content domain 2g. Question 5 presents students with a statement: "…they crossed the glassy surface of the lake" (STA, 2016, p. 8) and then asks for two impressions of the water that this gives. Marks were allocated for answers which referred to impressions of reflective/shiny, clear/transparent, still/calm/undisturbed or flat/smooth qualities. This question therefore required students to engage explicitly with vocabulary and the effects that vocabulary choices have on reader interpretations. The sample paper produced to guide educators in the new version of end of KS2 reading assessment awarded three marks (6%) to content domain 2g. Again, a statement from a text is provided in question 12 ("…in a flash" (STA,

2015b, p. 12)) and students are asked what this tells them about the burning of rocks in space. Possible answers could refer to the speed at which the rocks burn or the brightness that this burning evokes. These questions require students to consider the impact and connotations of particular words and phrases. Question 33 of the sample paper offers a different format for assessing domain 2g. This question directs students to read a paragraph beginning "I had the same feeling of mystery and danger around us". Students are required to "find and copy four different words from the rest of the paragraph that suggest danger" (STA, 2015b, p. 24). This seeks engagement with vocabulary, word choice and meaning.

Content domain 2a ("give/explain the meaning of words in context" (STA, 2015a, p. 7)) is allocated ten marks (20%) in the 2016 reading paper (STA, 2016). Some questions ask students to identify a word with a particular meaning. For example, question 1 requires students to "find and copy one word meaning relatives from long ago" (STA, 2016, p. 7). Others ask students to identify synonyms for given words: question 2 asks for a word closest in meaning to 'rival' and provides four options to select from. Some questions seem similar to those discussed for content domain 2g. For example, question 23 asks "what does the word *spat* suggest about how the island of Mauritius was formed?" (STA, 2016, p. 21). Students are required to consider the connotations of force, suddenness and carelessness to gain the mark. These examples demonstrate the requirement for students to engage with consideration of language, its effects and its meanings.

Content domain 2d (infer from a text) also demonstrates concern for language in some questions. Three of the marks within domain 2d in the 2016 SAT demand language consideration. For example, question 16 quotes "…milled around in bewilderment" (STA, 2016, p. 16) from one of the texts and asks students to explain what this description suggests about the baby warthogs. To gain the two marks available, students must refer to suggestions of the warthogs' aimlessness/random movements and to their confusion. This question therefore requires students to interpret the meanings of both "milled about" and "bewilderment". Also from content domain 2d, question 18 in the sample paper asks students how the words "gentle, and small, and frail…make the reader feel about the snail" (STA, 2015b, p. 15). This requires students to consider meanings of words and phrases and asks them to reflect upon the impact that vocabulary choices have on readers.

While discussion above does not include every question requiring explicit engagement with language, it does illustrate the propensity for language-based consideration and the significant proportion allocated to language exploration within end of KS2 assessment materials: 15 marks (30%) of the 2016 paper and 12 marks (24%) of the sample paper required explicit consideration of language. This represents a significant portion of available marks and points to the importance of effectively teaching skills of language-based reasoning (ranging from knowledge to evaluation) given the prevalence observed in both the academic and the school English cultures.

The five key styles of reasoning identified as important in English literature and for primary English have been presented in this section. Focus will now move to consider ways in which this framework has been evaluated (according to criteria identified in Section 3.1.4).

3.3   Evaluating the Framework

In addition to the rigorous methods drawn upon when creating the framework of reasoning styles, following the cognitive history tradition, the framework is evaluated in several ways. These criteria are set out in Section 3.1.4 and acted as a guiding structure to enable the rigorous identification and description of reasoning styles for primary English. It is now important to evaluate the outcomes of the conceptual enquiry in Study One, namely, the framework of reasoning styles for primary English, with reference to these criteria.

3.3.1   Theoretical and academic support

It is important to evaluate the outcome of the conceptual enquiry in Study One, namely, the framework of reasoning styles for primary English, with reference to evaluation criteria outlined in Section 3.1.4.

The first criterion focused on the identifiability of the styles within the academic culture of English literature and the theoretical and academic support for the framework. Engagement with this criterion has been made apparent in several ways. The styles articulated should represent ways of forming and justifying conclusions within products of the culture and should be supported by literary theory. Academic engagement with the reasoning styles in this framework is made clear through examples provided in Table 3.2 and within descriptions of each style. Literary theory and critique were considered to reflect on whether ideas contained within the framework are already part of academic theory in English literature. This is important since it would be expected that typical reasoning practices observed in this project and therefore representing ways of reasoning in English literature will have also been discussed in the field itself. This consideration was informally supplemented through discussions with scholars from the School of English at Durham University. This enabled key ideas to be 'tested' through discussion and afforded academics opportunities to share and point towards other theoretical ideas to be considered.

Moreover, since reasoning here is located within sociocultural theory, it is important that any identified styles have developed over time within the culture, rather than existing as innate processes of thought which would have developed in the absence of cultural settings. It is therefore important to consider whether the five styles can be traced throughout the historical development of the English literary culture. Thus, brief consideration was given to the history of literary theory and criticism, to trace the evolution of ideas and reasoning styles within English. This consideration mapped key developments in literary theory to the five styles which provides some context to the background of the identified reasoning styles.

In addition to reflecting on theoretical support for the reasoning styles presented in the framework, consideration of potentially 'missing' styles was made (see below). This focuses on practices identified as important in English, but which do not feature as separate styles in the final framework. This represents an important consideration since it helps to clarify the criteria on which styles have been selected.

3.3.2   Missing styles

One way of evaluating the framework of reasoning styles is to critically reflect on how comprehensive it is. While this project does not seek to identify an exhaustive list of reasoning styles, analysis has intended to include styles of prominence and importance within primary English. It is therefore importance to consider whether any other potentially important styles may have been omitted from the framework. This consideration is also part of the criterion for academic and theoretical support.

Inclusion of the five styles following conceptual enquiry has sought to consider possible styles comprehensively, through analysis of the academic discipline of English literature and supplemented by analysis of the Programme of Study for English and associated assessment materials. Despite the intended rigour, 'identification' of these styles is not presented as an objective activity yielding objective findings. Analysis of these materials has led to the tentative identification of key reasoning styles. The potential value these hold to supporting the process of learning to reason will be explored when educational materials are developed in schools. The framework may be subject to revisions upon reflection following the empirical phase. Yet, as well as questioning what *is* included in the reasoning styles framework, consideration must also be made to what *is not* included.

Use of source material

The use of evidence to support claims within English (at all levels of accomplishment) represents a key method of warranting arguments. This takes several forms. Firstly, source material may indicate primary evidence taken directly from the literary text. Using quotations to support arguments when discussing and analysing literary works represents a fundamental requirement of literary studies; it is incomprehensible to imagine analysis which does not refer to primary sources. Another form is the use of secondary sources to support claims. This includes using the ideas of others (such as literary critics/academics) to support claims. Yet these ideas will often demonstrate examples of discipline-specific reasoning styles. For example, quotes from academics may help to illustrate the context in which a text was written or is based (historical, geographical, social, religious and so on) and demonstrate reasoning based on contextual knowledge (contextual reasoning). Secondary sources may also pose analogies to other sources (literary texts, art, music) when forming conclusions

(analogy-based reasoning) or discuss implications of genre to interpretation (genre-based reasoning). It is evident from these possible sources that the use of source material and supporting evidence is important within each of the five styles identified, rather than representing a distinct style itself.

There is a parallel consideration in Hacking's (1992) analysis of Crombie's scientific styles (1995). He answers the rhetorical question regarding the absence of logic within Crombie's framework by pointing to the neutrality of logic in terms of topic. Kind summarises Hacking's argument stating "logic, including deduction, induction and abduction, is used in any kind of reasoning, while the styles refer to much more specific genres of scientific inquiry" (2016, p. 9[1]). Kind also considers the absence of particular scientific practices within the *K-12 framework for Science Education* (asking questions, engaging in argumentation and obtaining, evaluating and communicating information): "the comparison suggests practices are broader activities scientists *engage in* (Ford, 2008) compared to styles, which as Hacking says are ways of 'finding out' (Hacking, 2012, p. 3)" (Kind, 2016, pp. 9-10).

The use of evidence and source material therefore better represents a 'practice' adopted throughout English and across the five styles identified. These five styles, in contrast, represent specific ways of supporting and forming conclusions and for warranting claims.

Skills as separate styles or stages of progression?

There are some skills identified in curriculum documents which clearly receive priority, as indicated by frequent references and by their prominence within SAT materials. Some of these skills link to the five styles of reasoning discussed in this project. For example, content domain 2g: "identify/explain how meaning is enhanced through choice of words and phrases" (STA, 2015a, p. 7) clearly resonates with the language-based style. However, other skills and content areas within curriculum materials, such as those associated with retrieval, inference, and prediction, do not link with the five styles so explicitly. While there may be some argument to frame these skills as separate styles of reasoning, upon further consideration, they seem to represent elements of progression within each of the five styles described. Thus, the skill of retrieval is, understandably, heavily prioritised within the KS2

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[1] This paper was shared with me by the late Dr Per Kind in 2016. He was my primary supervisor at the time.

Programme of Study. The profile of content domains within the Reading Test Framework document identifies reference 2b: "retrieve and record information/identify key details from fiction and non-fiction" (STA, 2015a, p. 12). Suggested marks allocated to this skill in SAT tests are 8-25; or 16-50% of total marks. While the range of potential marks is wide, analysis of the 2016 KS2 Reading SAT demonstrates that fifteen out of fifty marks (30%) were allocated to this content focus. While this skill clearly needs to be taught explicitly, retrieval would be required within each of the five styles of reasoning described. For example, a child would be required to retrieve a linguistic feature to be discussed within the language-based style; they would have to retrieve genre-cues from a text and so on.

Similarly, the skill of inference is heavily referenced throughout the Programme of Study. The test framework describes content domain 2d: "make inferences from the text/explain and justify inferences with evidence from the text" (STA, 2015a, p. 12) and suggests allocating 8-25 marks, again representing 16-50%, to assessment of this skill. In the 2016 Reading SAT, 18 marks (36% of the total) were allocated to testing inference. In the same way as the skill of retrieval must be taught, inference must also be focused upon within teaching. Yet again, rather than this representing a separate style of reasoning, inference represents a stage of progression within the five reasoning styles described. For example, after a student has retrieved and identified a linguistic feature, they might be expected to infer what this means or suggests (depending on their age and stage of development). Similarly, after having identified genre-cues, a later stage of progression would see a student inferring what location within a genre might imply about a text.

The skill of prediction, referenced as 2e: "predict what might happen from details stated and implied" (STA, 2015a, p. 12), can be regarded in a similar manner. Although it is only intended to be awarded between 0-3 marks (0-6%), and in 2016 was allocated 3 marks (6%), it is clearly important within the curriculum. This skill again represents a stage of progression within each of the five styles. Thus, having retrieved genre-cues and inferred what these might suggest, a later stage may see a student predicting future events based on these inferences.

This section clarifies what is meant by a reasoning style in this project. Styles are distinct ways of forming and justifying conclusions, based on different evidence types. They do not refer only to practices important within English, but specifically address the reasoning process.

The second crtierion used to evaluate the framework of reasoning styles will now be discussed.

3.3.3   Applicability to primary English

The second criterion used to evaluate the framework of reasoning styles relates to their applicability to primary English; styles must be appropriate and important in the subject of English at the primary stage of education. While examples of reasoning styles from English literature would demonstrate a much greater level of sophistication in terms of knowledge and understanding, key features of these reasoning styles should still be applicable and appropriate to the primary stage. Elements of the styles should also be, at least partially or implicitly, evident in National Curriculum documents. Evidence for this has been gathered through analysis of relevant National Curriculum documents and end of KS2 assessment materials. Such documents are drawn upon when each individual style is discussed with a more general discussion also provided (Section 3.2.1). Examples of how specific reasoning styles might manifest at the primary stage are also provided in Study Two (Chapter 4) where the framework is operationalised.

3.3.4   Internal coherence

The third criterion for evaluating the framework requires that the reasoning styles demonstrate internal coherence. This criterion focuses on whether the styles are distinguishable from one another. While overlaps between styles of reasoning may occur in practice, descriptions and key hallmarks should be distinctive. Consideration of potential overlaps has been made explicit within discussion of the separate styles (for example, between the structural and the genre-based styles). This was supported through provision of examples, from both academic sources (see Section 3.1.1) and school-based sources (see Section 3.1.2). Coding of transcripts created within Study Two will also support evaluation of internal coherence and permit further clarifications to be made to each of the styles: if codes are difficult to apply, overlaps or blurred boundaries will be identified which may lead to modifications to the framework or further reflections on the distinctiveness of styles to ensure that clear parameters are established.

3.3.5   Communication with teachers

Fourthly, the framework is evaluated through a process of communication with teachers. Ideas must be communicable. Since it is intended that the conceptual enquiry phase of the project will lead to an empirical phase of activity development and exploratory investigation with teachers in primary schools, the capacity to communicate ideas to those working in schools is paramount. Difficulties experienced when explaining issues or aspects of the framework may lead to further clarification to enhance communicability. In addition, feedback on the framework has been sought from primary school teachers, operating across the primary age range. It is important that teachers felt that the framework 'made sense' (face validity), fit with curriculum objectives and can be promoted through particular task structures and lesson activities.

The framework of reasoning styles developed during Study One has been shared with seven primary school teachers working across the full KS2 range in two different schools. The framework was shared verbally by me, as the researcher, with written summary documents also provided for teachers to refer to. Teachers seemed able to understand the key ideas presented. Following discussion and opportunities for questions, most teachers were able to provide examples of where the styles might fit into their planned English topics/texts. I then worked closely with three teachers in two different schools to develop and teach activities designed to target domain-specific reasoning as part of the empirical phase of the project. While this is not discussed in detail here, it is important to note that all three teachers were able to work collaboratively with me (supported by the summary documents that they were provided with), to plan and deliver these activities. Teachers were able to consider the types of questions that they might ask to promote specific styles of reasoning, and as the empirical phase of the project developed, they were increasingly able to identify student examples of engagement with reasoning styles. Findings of Study Two (Chapter 4) also provide evidence to support the argument that teachers were able to understand the main ideas of the framework. Teachers led the lessons and introduced the activities to students. They also made the explicit reasoning style targeted in each lesson explicit. Promising proportions of domain-specific reasoning in both the researcher-supported and independent groups suggest that teachers were able to engage with key principles of the framework of reasoning styles and build these into

their teaching. This evidence demonstrates engagement with the fourth criterion used to evaluate the framework of reasoning styles developed in Study One. Feedback from teachers will also be considered later in response to RQ 2 as part of Study Two.

3.3.6 Overall evaluation of the reasoning styles framework

The framework of reasoning styles for primary English presented here and the analysis underpinning it address the project's first research question: what styles of cultural reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?

Consideration of the criteria guiding creation of the framework and the ways in which it was evaluated demonstrate its rigorous construction. The framework was guided by clear criteria which enabled me, as the researcher, to critically observe and evaluate the reasoning practices demonstrated in the field of English literature and observed within the primary English culture. This analysis supported the construction of a framework of reasoning styles which has academic and theoretical support, is applicable to primary English, demonstrates internal coherence and can be communicated with schools and teachers.

The framework of reasoning styles created in Study One will be drawn upon in the exploratory empirical phase of the project, Study Two. The following chapter will present the methods used to address RQ 2.

4 Study Two: Exploratory Empirical Phase

RQ 2 asks: *can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?* The empirical phase of this study was required to address the second research question. The broad aim of this project was to construct a framework of reasoning styles required in and appropriate to Primary English (see Chapter 3) and to use this framework to develop activities which promote disciplinary styles of reasoning. The aim of the empirical stage of the study was exploratory. Activities developed based on the framework of reasoning styles created in the conceptual enquiry phase were formally investigated in classrooms to explore the potential and possibilities of promoting specific reasoning styles in primary teaching.

This chapter will detail the overriding methodological framework and individual methods used to address the project's second research question. This will include discussion about how activities were designed and then used in classes; how data was captured; and how this data was coded for analysis. There will be consideration of potential limitations to methodological decisions and the impact that these may have had on outcomes and findings.

4.1 Sociocultural methodological Framework

Sociocultural theory (Section 2.2.2) is used throughout this project as a lens through which to view reasoning. Sociocultural theory emphasises the importance of shared thinking, communicating, reasoning and other social practices (Mercer, 2007, 2013). It prompts the study of reasoning within a culture, rather than with individuals (Fodor, 1983; Berger & Luckman, 1966, 1991; Fuller, 2002). It is recognised that sociocultural investigation of constructs which are traditionally studied from an educational psychology perspective demand different methods and approaches (Pressick-Kilborn, Sainsbury, & Walker, 2005). Methodological decisions throughout Study One and Study Two are therefore guided by sociocultural principles (see also Section 3.1).

In relation to Study Two, methodology which aligned with sociocultural theory required that students worked collaboratively, engaging in processes of shared thinking, communicating and reasoning (Fernández, Wegerif, Mercer, & Rojas-Drummond, 2001; Howe, 2010; Mercer, 2007;

2013). This prompted use of collaborative student groupings within the empirical phase of the research. This meant that reasoning was studied from within a culture, as opposed to with individuals (Fodor, 1983; Berger & Luckman, 1966, 1991; Fuller, 2002). Sociocultural theory and its major tenets also led to a focus on analysing student dialogue, with language representing a means of mediating knowledge, understanding and reasoning processes (Mercer, 2000; van Drie & van Boxtel, 2008; Vygotsky, 1962, 1978; Wertsch, 1991; Wolfe & Alexander, 2008). Tasks were developed to frame and structure group discussion. Tasks represented sociocultural tools to scaffold student engagement in social practices and domain-specific reasoning particularly. Audio recording and transcription of student dialogue aligned with sociocultural concern for gathering rich detail which recognises the importance of context and culture, as well as the individual within a social setting (Pressick-Kilborn, Sainsbury, & Walker, 2005). Development and application of a coding instrument designed to identify productive forms of educational dialogue in collaborative activities enabled data analysis which complements the sociocultural framework (see also Section 6.1.1). The diagram below (Figure $$$) provides an overview of stages involved in the research process. Alongside major phases of research, sociocultural considerations are mapped. This illustrates the location of the methodological framework for this project within sociocultural theory.

Phases of Research

Study One

Creation of reasoning styles framework

Study Two

(1) Observational phase

(2) Piloting and Empirical Exploration

Task design

Collaborative groups work

(3) Data collection

Capturing dialogue

-Audio recording

-Transcription

(4) Analysis

Coding dialogue

-Identifying proportions of domain-specific reasoning and other productive dialogue

-Exploring variation by task and group condition

-Transcript data exemplification

Sociocultural Considerations

Immersion in culture

Analysis of socio-cultural practices

Authentic learning situations

Mediating tools

Interaction and collaboration

Engagement in cultural practices

Language and dialogue

Engagement in cultural practices

Appreciation of richness of sociocultural contexts

Figure 4.1 Phases of Research

4.2   Data collection

Data collection for the empirical phase of the project had three distinct stages. First, there was an observational phase observing existing practice in primary English. Then there was a piloting stage where potential activities were tried in classrooms and revised as required. Finally, there was a formal exploratory stage where activities were developed, used in classrooms and audio recorded for transcription and analysis. The following section will expand upon these stages.

4.3   Sample

Both schools involved in data collection are in a city in the North East of England. School A is an average-sized two-form entry junior school (years 3-6) with a predominantly white British intake. This school has a much higher than average proportion of students eligible for pupil premium (approximately 35% are eligible for free school meals[2], one pupil premium indicator), although proportions identified as disabled or having a special educational need is just below average. School B is a much larger than average-sized two form entry primary school with nursery provision. Most students are of white British background. The proportion of students eligible for pupil premium is lower than average with approximately 10% eligible for free school meals. Proportions of students identified as having a special educational need is below average. Although the two schools were recruited based on voluntary participation and accessibility to me, as the researcher, (see limitations, Section 4.14.2), deliberate differences in contextual factors were sought when recruiting. While this comparison is not used to make generalisable claims regarding the applicability of findings to a range of school types, it is useful to consider data from schools which differ according to a number of factors (such as eligibility to free school meals) identified as potentially impactful to outcomes (Gorard & Siddiqui, 2019).

The contextual indicators above illustrate major structural differences between the two schools involved in this study. However, it is also important to comment on their similarities, and their 'characters'. On the whole, all class members involved shared similar values and dispositions. These values were evident during whole class discussions and when teachers delivered instruction during

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[2] In January 2019, for all school types, 15.4% of pupils were eligible for and claiming free school meals (DfE, 2019).

the upfront portion of lessons. Students were respectful and engaged. They listened to their teachers and other adults as well as listening and being respectful of contributions from their peers. Positive attitudes were also evident during lesson activities and group work. Although I did not see evidence of specific ground rules for talk (Mercer, 2013; Mercer & Littleton, 2007) being made explicit, the classes all engaged with principles of dialogic teaching and learning. Robin Alexander proposes five principles suggesting that dialogic teaching is: collective, reciprocal, supportive, cumulative, and purposeful (2008, p. 38; see Section 2.7.1). Many examples of teachers and students addressing learning tasks collectively were observed (during observational and empirical phases of the project). Exchanges between teachers and students were reciprocal. Class members listened to one another, shared ideas and explored alternative ideas. At times, discussion was developed cumulatively to form coherent lines of thinking. The atmosphere in classes involved in this study was supportive. Students did not appear fearful of getting answers 'wrong' and attitudes from teachers and students were positive. The extent to which teachers planned and facilitated dialogic teaching in relation to specific goals varied across phases of the project, but the lessons developed and explored empirically could all be considered purposeful. This description characterises the dialogic pedagogy in place in classes involved in this study. Students and teaching staff appeared motivated, engaged, and willing to learn.

4.4   Observational phase

A fundamental ambition of this project was to investigate whether the framework of five styles could be applied in schools. Although initial construction of the framework aimed to adopt a pragmatic approach by considering both the academic culture of English literature and the primary English curriculum (including associated assessment materials), it is recognised that this process was still largely theoretical. To enhance the framework's applicability to primary education, it was important to gain perspectives of the theoretical tenets of the framework from primary school teachers.

Several strategies were employed with this intention. First, I met with eight teachers working mainly in KS2 (although most also had experience in KS1). This was an opportunity to present the main tenets of the project and represented a source of feedback for the styles framework (with no requirement for further involvement in the project). The five styles were described and explained to teachers, with illustrative examples from both academic literature and from potential classroom

activities shared. Links were also made to National Curriculum and assessment examples. This aimed to fulfil another objective of these meetings: to persuade teachers of the value and importance of reasoning in primary English. By presenting the styles as educationally valuable in their own right (to provide explicit teaching of reasoning styles important for fuller participation in the English domain), then supplementing this with pragmatic arguments focusing on the presence (mainly through implication) of the styles within the National Curriculum and end of KS2 assessment materials, it was hoped that teachers would not view the project as another initiative with which they might feel burdened. These meetings were relatively informal but were an important source of feedback and represented a way to gauge how ideas were received by teachers.

Discussions with teachers indicated that the framework made sense to them. Although tentative and based on a small sample, all eight teachers responded positively to main ideas developed in the framework and indicated that targeting of the styles could be accommodated within their schemes of work. Several teachers formulated initial ideas about where one or more of the reasoning styles might fit into their existing planning. This suggested that the framework could be communicated with teachers (the fourth evaluation criterion).

An additional strategy employed when considering the practical applicability of the framework was an observational phase. I visited two schools and worked in years 4, 5 and 6 classes over the period of a term. This period afforded opportunities to access student exercise books, displays and teaching plans. During this time, I worked with five teachers with varying levels of experience and areas of specialism. This period enabled me to observe daily English lessons, as well as additional sessions arranged at different points during the school day which focused on aspects important in English. I kept extensive notes of observations and discussions with both teachers and students. I noted initial reflections and evidence of any of the five reasoning styles being used, and later analysed notes and recorded ideas more formally. One purpose of this period was to identify whether any of the five styles already appeared in lessons and where this was most likely to happen. I also aimed to identify potential opportunities for where these styles could be incorporated into the curriculum more explicitly. These ideas were discussed with teachers, who also offered their own reflections. This enabled a richer appreciation of typical lessons in these classes and supported the planning and piloting phase. By sharing reflections with teachers, teachers also enhanced their own understanding of the reasoning styles framework, and of ways in which reasoning might be promoted. This was

beneficial for those teachers who were later involved in the piloting and formal exploration stages of the study.

The observational phase of the study was informal. Data was gathered in the form of observation notes, notes following discussion with teachers, examples of student work and teacher planning. This was not analysed systematically mainly because the subjectivity of these observations and materials is acknowledged. Comments on what was observed during lessons only applied to the schools in which I was observing. The short time period compounded the difficulties related to how representative findings were (even within the schools involved). Notes were used primarily to inform the piloting phase. The observation phase provided evidence that the framework could be communicated with primary teachers and made sense to them (the fourth criterion guiding creation of the styles framework). It also enabled consideration of where the styles might be accommodated within current planning based on National Curriculum objectives (the second criterion). I had become accustomed to the ways in which classes typically operate in the schools involved in the study and was familiar with long- and medium-term planning for English, including literature to be studied. This helped me to work with teachers to plan for opportunities to promote the three targeted reasoning styles.

4.5   Piloting

While working in Schools A and B, I had opportunities to design, plan and pilot some potential activities to be used during the formal stage of data collection. Activities were mainly developed in one school (two-form entry) with children in Year 5. These activities were developed collaboratively with the class teacher, who had become familiar with the framework of reasoning styles during the observational phase. I had presented the framework to her in detail and she had also read and reflected upon summaries of the main ideas. It was considered important to develop activities collaboratively to give teachers ownership of the aims and strategies and to encourage deeper understanding of the framework. It was hoped that through this appreciation and understanding, teachers would be able to plan their own curriculum with a focus on discipline-specific reasoning.

Initially, piloted activities were discussion-based lessons, with key questions presented to students in varying ways, and with a focus on one reasoning style within a particular activity. These were well-

received by students and teaching staff involved but we sought to consider other potential formats, in addition to more traditional question and answer group discussion activities.

Thinking Through Primary Teaching (Higgins, 2001), and source material produced by the Thinking Skills Research Centre at Newcastle University (Higgins & Baumfield, 2001) were drawn upon to support activity development. For example, fortune lines, variations of odd one out and diamond ranking were used to provide a structure for encouraging and developing a chosen style of reasoning in English lessons (see Section 4.13). These activities were selected to promote discussion, scaffold reasoning and to give students an engaging, open-ended task within which explicit reasoning was required. Notes and reflections about student responses to these activities were made by me as the researcher, the class teacher and the teaching assistant. No audio recording was used at this stage. Following each pilot lesson, all adults involved held a debrief session. This provided an opportunity to share initial analysis of findings. The teacher and teaching assistant were able to comment on aspects such as student engagement, level of understanding demonstrated, and group dynamics, and could reflect on whether the activity seemed to promote the intended style of reasoning. This also marked the beginning of attempts to classify reasoning styles, in terms of how they might present in practice (see Study One). This represented an important early stage in the development of a coding framework. The debrief with teaching staff enabled modifications to be made to the pilot lesson, to refine aspects before the activity was explored formally.

4.6   Selection of styles to be included in investigation

Although five styles of reasoning were identified for primary English during Study One, it was necessary to restrict empirical focus in Study Two to three reasoning styles. This was to ensure that sufficient evidence could be gathered within each style across a range of activities in different classes and/or schools. Through the process of piloting, three reasoning styles emerged from the framework that could be targeted within the formal exploratory investigation: genre-based (GRE), language-based (LRE) and analogy-based reasoning (ARE). These styles were selected for several reasons. First, they were considered important, appropriate and relevant to KS2, regardless of text or text type studied. Piloting suggested that they could be readily accommodated and applied across the age and ability ranges within the two schools. Targeting of these styles did not typically place increased demands on teachers beyond planning of the activity and these activities were readily accommodated into existing schemes of work.

In addition to consultation with teachers and consideration of the piloting phase, the GRE, LRE and ARE styles are also prevalent in National Curriculum materials (typically through implication). Each style is described in relation to the National Curriculum (Section 3.2). These reflections enable some tentative consideration of the prevalence of each style in the primary curriculum and its assessment materials. Table 3.3 maps potential reasoning styles to references from the Programme of Study for English. Engagement with language and genre (mapped to LRE and GRE) is particularly evident. The analogy-based style was also selected for empirical investigation. This is alluded to in the Programme of Study (through emphasis on making comparisons within and between texts). It was also considered to represent a key component of English, particularly in reading, by teachers. A combination of presence in the academic culture of English literature, presence in curriculum documents, support from teachers and experience in the piloting phase led to the inclusion of ARE in the empirical phase of the project. While problems of considering reasoning styles with reference to curriculum documents have been considered (Section 3.1.2), it is important to ensure that initiatives align with, or complement, statutory curriculum aims. Considering curriculum materials in addition to texts and other products of the academic discipline of English literature enhances legitimacy and helps to gain support and co-operation from schools by explicitly considering links between theory and practice. Limiting demands placed on teachers and the capacity to readily accommodate GRE, LRE and ARE into existing schemes of work garners further support for the inclusion of these styles.

Readily accommodating CRE and SRE into existing schemes of work was found to be more difficult during the piloting phase, and often required additional lessons. One reason for this difficulty rests on the need to have developed sufficient background knowledge and understanding to be able to engage in CRE and SRE. For example, students cannot draw on contextual features of a text to support their conclusions or claims if this understanding is not developed. Developing this understanding typically requires additional lessons, perhaps with a historical focus. While such consideration might be prioritised for some texts and at some points in the curriculum, it is unlikely that such detail will (or can) be emphasised for all literature studied. Table 3.3 illustrates a reference to the importance of background information included in the Y1 and Y2 *Reading* component of the Programme of Study. However, until KS3, there is no further mention of the need to consider contextual factors during reading (or writing). While many teachers would explore relevant contextual or historical details when reading texts, this is not emphasised in curriculum documents or end of KS2 assessment materials. Moreover, it would be difficult for teachers to maintain a focus

on context for all literature considered. Reasoning about texts does not usually rely heavily on engagement with contextual factors at the primary stage.

SRE also tends to place increased demands on teachers and students. Students have to be taught structural features and have time to consider effects of structural decisions. This is not something that is emphasised in current primary classroom practice, at least not consistently. Moreover, in depth consideration of structural features which combine to develop unity within a text is not required within the primary National Curriculum. The structural style is briefly alluded to in the Programme of Study at upper KS2 yet is not elaborated upon: "pupils should be taught to: understand what they read by: identifying how language, structure and presentation contribute to meaning" (DfE, 2014, p. 45). Yet the structural style of reasoning described in this project is rather more complex than may be inferred from use of the term 'structure' in the Programme of Study. The structural style is not primarily concerned with identifying writing structures, but mainly focuses on consideration of how writers achieve a sense of unity through combination of structural devices (including narrative structure, presentation of images, dialogue and so on). This is a complex feature of literary study and may be beyond the typical experience and capabilities of a primary-aged student (particularly when moving beyond identification of structural techniques). Thus, while identified as an important style of reasoning in English, the structural reasoning style may be more suited to the secondary age range and beyond. This view was echoed by views of primary teachers involved in the observational and piloting phases of the project.

This section details the processes used to decide which reasoning styles to include in the empirical phase of the investigation. Creation of the framework required engagement with curriculum materials (see Section 3.1.2). The two reasoning styles excluded are therefore applicable within primary English, albeit perhaps to a lesser extent than the three styles selected for empirical investigation. The structural and contextual styles were considered less important and relevant at the primary stage. They typically placed increased demands on teachers and students in terms of developing sufficient background knowledge and understanding. They were therefore considered more difficult and time-consuming to provoke, particularly because they require teaching which goes beyond National Curriculum requirements. These exclusions point to potential avenues for further research. Additional empirical research might investigate the possibility of promoting contextual and structural styles of reasoning in primary English classes. Furthermore, the two

excluded styles might also be investigated with students at a later stage in compulsory education (Key Stage 3 or 4).

4.7   Formal exploratory stage

Five classes from KS2 (years 4, 5 and 6) in two primary schools in Sunderland participated in the formal exploratory phase of the project. Approximately 150 students and three teachers were involved in this phase. 25 audio recordings from 10 lessons were made and transcribed. Lessons were planned collaboratively with teachers, based on previously piloted activities. The content base was different for lessons in the formal data collection phase since tasks were applied to the text(s) currently being considered in English lessons to enhance authenticity, progression, and connectedness in student learning. It was hoped that this strategy would also support teachers in their future planning and development of activities to promote discipline-specific reasoning either after or alongside the project's exploratory investigation phase. Since teachers had opportunities to observe and consider how different reasoning styles and task structures could be used within a unit of work, to complement existing learning objectives and to promote reasoning, teachers should have developed confidence in planning to include these activities and to target reasoning.

Activities in the formal exploratory phase were designed to explicitly target and promote engagement in a reasoning style from the three styles deemed most appropriate in KS2 (GRE, LRE and ARE). Four activities were used across these styles (odd one out, fortune lines, role on the wall and diamond ranking; see Section 4.13). Each task structure was used to promote at least two different reasoning styles on different occasions, to consider whether different task structures could be used to promote a given reasoning style. This also permitted consideration of whether there were differences in reasoning when using the same task structure to promote different styles. This supported consideration of the extent to which the styles are robust and distinguishable from one another (one criterion for evaluating the framework identified in Study One).

Tasks in the formal exploratory phase were completed in small groups of between two and four students (identified as the optimal small-group size in a meta-analysis by Lou et al. (1996)) and were audio recorded for transcription. Some groups worked independently and one group in each recorded lesson worked with me as the researcher and teacher. By recording an independent group

and a group supported by me (the researcher-supported group), two comparison conditions were created. This permitted consideration of the proportions of discipline-specific reasoning observed, and of the difference between proportions of reasoning in each condition (independent and researcher-supported). Although it might be expected that domain-specific reasoning was typically greater in the researcher-supported group, if the reasoning styles are realisable in the primary classroom with appropriate scaffolding structures, it would be expected that the independent group should also engage in these reasoning styles.

I was familiar with all students following the observational phase of the study which meant that my presence was not a novel experience for students by the formal investigation stage. As a result, concerns about the potential impact on pupil confidence and their subsequent willingness to contribute to group dialogue based on lack of familiarity with me as the researcher were mitigated. Moreover, group members worked with peers from their own classes, in a way which was similar to what might happen in daily school life (see consideration of potential sources of bias and how these were mitigated in Sections 4.14.4).

4.8 Ethical considerations

This project adhered to ethical guidelines for educational research as required by the School of Education at Durham University and based on the British Educational Research Association's *Ethical Guidelines for Educational Research* (BERA, 2018).

Ethical approval for the project was granted in two stages. For phase one, ethical clearance was awarded on 02/11/2017. This covered an initial observational period, where I observed current practice across six classes in two schools. There was no empirical investigation or intervention at this point. The second phase was granted ethical approval on 05/01/2018. This covered the empirical phase of the project (Appendix D).

Head Teachers at two schools were initially contacted to seek their involvement. I met with class teachers to explain the aims of the project and to detail what involvement would include. Students

involved also gave informed consent. They were fully informed about the nature and purpose of the research, how results would be used, how anonymity and confidentiality were ensured and were made aware of their right to withdraw at any time within the research process. This was shared in a manner suitable for children with any questions clarified. I sought verbal consent from all children involved following my information sharing session, and again, prior to any audio recording that they were involved in. Head Teachers, class teachers and participating students were therefore fully informed about the purpose, nature and process of the research.

This research used parental 'opt-out' consent. Parents/guardians were provided with an information sheet detailing important aspects of the research process (aims, methodology, how the findings would be used, how anonymity/confidentiality were ensured as well as the commencement date of data collection). They were advised of their right to withdraw their child at any stage within this process. This is consistent with BERA ethical guidelines (BERA, 2018). The primary reason for using a system of 'opt-out' parental consent was that all activities used in the formal exploratory phase are not dissimilar to those expected and found in school lessons and are consistent with normal classroom practice. It was not anticipated that involvement could cause harm or disadvantage to anyone involved. Moreover, rather than seeking to track changes in individual student reasoning, the project aimed to investigate whether tasks provided opportunities to promote engagement with different reasoning styles. There was therefore no need to identify, even through a process of anonymisation, any individual student.

A further important issue contributing to the decision to use 'opt-out' consent focused on the children for whom permission may not have been provided if using traditional systems of 'opt-in' consent. It is possible that failure to 'opt-in' would be due to factors such as lost letters, parents forgetting or not having time to read and complete permission slips, or perhaps not viewing these slips as important. Those children would have been excluded from the project. The exclusion of some students from potentially educationally valuable activities risked being unfair and therefore unethical. It was believed that 'opt-out' consent gave appropriate opportunities for parents to withdraw their child if they wanted to, but mitigated risks of children being unintentionally prevented from participating.

4.9   Study procedure

Activities subject to formal exploratory investigation were planned and delivered using a similar structure. During planning meetings, the class teacher worked with me, as researcher, to consider which style of reasoning to promote within a lesson and to decide upon the task structure to be used. While it was necessary that the three reasoning styles identified as most important to KS2 English development were targeted, planning was flexible in terms of when these were covered. The teacher and I worked together, in consultation with the English Programme of Study (DfE, 2014) and the school's long- and medium-term planning grids for English, to decide when promotion of each reasoning style fitted best into the curriculum. This meant that there were occasions when I would not be working in a school for several weeks since it was believed that activities promoting different reasoning styles should fit into English lessons as authentically and meaningfully as possible. While this meant that data collection spanned several months, this was a worthwhile compromise to ensure that activities fitted seamlessly into existing lesson sequences.

In the formal exploratory phase of the investigation, microphones were set up around the classroom to capture the upfront, whole class teaching. The teacher introduced the lesson, explained the task structure and particular requirements within the lesson context, and modelled how students might address the task. Questioning was used to gauge student understanding and to ensure any necessary clarifications were provided. The teacher made the reasoning style to be promoted explicit to students. The teacher would recap what reasoning means, what it might look like and how specific styles of reasoning might require different focuses during the process of forming conclusions. This was not done in a rigidly structured manner. Rather, students were reminded of the focus on reasoning, saw this demonstrated by the teacher (with some practice as a whole class), and then practiced in smaller groups.

Students then moved into their small groups. These were different for each recorded lesson to ensure that students were given multiple opportunities to work with other class members and in different research conditions (independent, or researcher-supported). Students worked in groups of two to four, depending on the nature of the task. One group worked in a designated area with me, as researcher. Microphones recorded audio and necessary task resources were in place. Several other groups worked within the main classroom but with some support from their class teacher. A final group worked independently outside of the classroom in a designated practical area.

Microphones recorded audio. The classroom door was left open and a teaching assistant was nearby to ensure the group's safety. For every lesson, different children were selected to be part of audio-recorded groups. This helped to ensure that all children felt valued as participants in the project and meant that any discipline-specific reasoning observed was taken from a broad range of students of varying attainment levels and with a range of other individual differences. Tasks were designed to last between fifteen and thirty minutes, but this was flexible. After completing a group task, the teacher held a plenary session with the whole class. This drew together ideas from most groups, enabled discussion about various strategies used to approach the tasks and gave students opportunities to model the reasoning they had demonstrated in their groups.

4.10 Data collection and analysis

Section 4.12 will detail methods used to record, transcribe and code student dialogue. Briefly, both qualitative and quantitative data will be collected and presented in the Results chapter. Previous research focusing on dialogue has tended to use either 'qualitative' or 'quantitative' methods, with the majority opting for the former. Howe and Abedin's (2003) systematic review of literature related to dialogue identified 59 studies with only 7 using quantitative methods. The volume of data and the ease of comparison across samples made possible by using quantitative methods are obvious benefits, however this can be at the expense of capturing in-depth, meaningful and contextually situated data from which much might be learned. This project will draw on both types of data (see Joyce-Gibbons (2014) for another example of using both data types to explore dialogue). Descriptive statistics will illustrate proportions of discipline-specific reasoning observed in each activity, for each group. Hennessy, Howe, Mercer and Vrikki (2020) outline advantages of frequency counting which include being able to: reduce and process large amounts of data to illustrate key dialogue markers; search data efficiently and observe how dialogue moves manifest and correlate; search for patterns and turn-taking; measure change (e.g. in participation, practice or learning) over time; characterise various forms of dialogue observed in an educational setting; and make comparisons (e.g. across groups or schools). In this project, frequency counts of the number of turns for each code will enable calculation of proportions. These proportions can then be compared across activities according to task structure used, reasoning style promoted or type of group (independent versus researcher-supported). Proportions of other forms of dialogue move will also be reported and analysed where appropriate.

Inferential statistical methods will not be used. These would not be appropriate given the lack of random sampling methods (Gorard, 2014, 2018; White & Gorard, 2017) and the small-scale, exploratory nature of the project. This project only requires proportions of discipline-specific reasoning to be reported (a type of descriptive statistic) since it aims to establish whether this type of reasoning can be elicited in student dialogue and reliably coded. In addition, tasks used were not designed to be comparable and groups were naturalistic. The support received by groups also varied (most tasks had a researcher-supported and an independent condition but this was not possible in every instance; some groups received support from the class teacher although these were not included in analysis because of inconsistencies in length of time the teacher worked with groups and due to poor recording quality). Because of these variations, I could not be confident that variation in frequencies did not relate to other inconsistencies and so decided inferential statistical methods would not be appropriate for this study. Nevertheless, this exploratory study may pave the way for future experimental research designs. In addition to descriptive statistics, qualitative data will be taken from transcripts of collaborative tasks. This will be used primarily to supplement and exemplify the quantitative findings reported (following the coding process).

4.11   Research questions

The overall research question addressed in Study Two is:

RQ2: *Can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?*

This was broken down into two sub-questions to guide the data collection, management and analysis processes. These sub-questions supplement the main RQ and help to address the overall question in a rigorous and comprehensive manner. The first sub-question asks:

Sub-question 1: *Can relevant reasoning in English literature be identified in children's language in primary classrooms?*

To address this sub-question, there will be a focus on the coding process. The coding framework to capture discipline-specific reasoning in English, including how it was designed and tested, will be discussed. It is believed that modifying and extending an existing coding framework to

operationalise styles of reasoning in English represents an original and important contribution made in this project.

The second sub-question asks:

Sub-question 2: *How do styles of reasoning in English relate to the task structures used to promote discipline-specific reasoning?*

This sub-question will guide discussion about decisions regarding task structures. The task structures used will be described and evaluated. This phase of the empirical project collected both qualitative and quantitative data. The possibilities of stimulating specific styles of reasoning in English will be demonstrated with reference to extracts from student dialogue. Proportions of codes and statistical analysis based on findings from transcript data will supplement consideration of the potential to promote particular reasoning styles using selected task structures.

The methods used to address the two sub-questions presented above will now be presented in detail.

4.12 Sub-question 1

Can relevant reasoning in English literature be identified in children's language in primary classrooms?

4.12.1 Live observation and analysis methods

To address this sub-question, children's language had to be captured. One potential method explored was the use of live observation and coding which remove the need to record and transcribe and is beneficial in several ways. Data is created and analysed much more quickly, since these processes are conducted in real time. The speed at which data can be analysed supports development of the research project, by immediately making the researcher aware of potential

modifications required to satisfy demands of the RQs. Researchers may also be able to create a larger data set, since considerable time is saved on transcription (Smith & Hardman, 2003).

A further benefit of using live observation and analysis techniques is the potential this creates to minimise forms of bias involved in observational methods, which may be introduced by using recording devices. The *reactivity* form of bias identified by Cohen, Manion and Morrison (2018) relates to changes in behaviour from participants because of knowledge about being observed. Although live coding methods would reduce this form of bias, many other potential biases identified by Cohen, Manion and Morrison are mitigated through use of recording (see Section 4.14.4). Moreover, my previous involvement with students involved in this project helped to minimise potential reactivity effects.

Live observation and analysis would also make the processes of establishing levels of reliability and validity of findings more difficult. By audio recording and transcribing student dialogue, it is possible to make this dialogue available for others to observe. Critical discussions with the project supervisor about the reasoning observed (and the coding of this) were made possible by the availability of transcripts. The capacity to reuse data collected to address different RQs is also made possible with transcribed data. Thus, although there are benefits to live observation and analysis, particularly in terms of time savings, the compromises that using these methods would have entailed (no data for public scrutiny, limited means of establishing reliability and validity, problems of bias described in Section 4.14.4), meant that this was not considered a viable option for this project.

4.12.2 Audio recording

As a result of the enhanced possibilities for establishing reliability and validity and the potential to minimise forms of bias in observational research identified by Cohen, Manion and Morrison (2008), this project captured children's language using audio recording. This created a digital output of audio for each group to be used during transcription. At least two recording devices were used per group to avoid recordings being affected by faulty devices or other technical issues.

Although preferential to live observation and analysis in this project, audio recording also brings compromises. Contextual, visual and other non-verbal aspects at play during group tasks could not be captured using audio recording (Mishler, 1986; Plowman & Stephen, 2008). These other forms of communication may have added to the verbal information recorded. When considering this project specifically, visual communication involved when addressing tasks, (such as pointing to an area on a fortune lines grid or moving items around a diamond ranking grid) would be absent from audio recordings. Video recording may have captured some of these non-verbal interactions. Despite some benefits of video recording, the increased recording and analysis demands meant that this method was not used. Moreover, since the project focused on student participation in verbal, disciplinary-based reasoning, visual data was not a major requirement. Having video data may have supported quicker identification of task decisions students made but would not have offered any examples of domain-specific reasoning (or indeed any other form of dialogic move) which would be coded for analysis. Despite some problems related to audio recording, it does have practical benefits and represented a useful way of capturing the level of data required in this project.

4.12.3 Transcription

Audio data was then transcribed. Although transcription is common in academic research, it was not the only option available. Indeed, linked to live observation and analysis, live coding (using recordings rather than real time observations) was a possibility. This method was appealing given potential time saving benefits. However, for reasons elaborated on previously (such as concern for reliability and validity), and those which become apparent in discussion of Jenks' (2011) four functions of transcripts (below), this project did not use live coding.

There are various transcription procedures, depending on the research background, aims and data requirements (Atkinson & Heritage, 1999; Cohen, Manion, & Morrison, 2018; Flick, 2018). Transcription conventions in this project are detailed below:

- Each speaker was given a name to identify their role (student/teacher/researcher) and to indicate the order in which they entered discussion (e.g. student 1, 2, 3…);

- Each change of speaker required a new line (representing a 'turn'[3] in transcripts);

- Turns were numbered.

- If more than one participant spoke at the same time, both names were recorded beside the line spoken.

- Ellipses were used to indicate pauses or silence.

- Square brackets added extra information or missing words to ensure that meaning could be ascertained more readily when accessing transcripts (such as description of group task decisions like plotting points on fortune lines graphs. These details were provided by adults working with the group or through observing completed task resources).

- If part of the recording was unclear to me, as researcher, and to the project supervisor, square brackets containing the word 'inaudible' were used.

Given the focus on verbal demonstration of reasoning styles at the turn level, tone of voice, pitch and other linguistic, conversational or non-verbal details were not recorded in transcripts. Transcription was undertaken by both me, as the researcher (approximately 50%), and by a professional transcription company (approximately 50%). Transcripts created by the transcription service were checked and amended by me, in a careful process of listening to recordings while simultaneously checking transcripts. Because my involvement formed part of the data collected (when working with a group in the researcher-supported condition) and given my familiarity with the local dialect and accent, it was important that all transcripts prepared by someone else were checked for accuracy (Gibbs, 2018).

Four main functions of transcription are identified by Jenks: represent, assist, disseminate, and verify (Jenks, 2011, p. 5). Transcripts serve to *represent* a communicative event which has taken place in the past, using an alternative medium (text-based). Transcripts also *assist* in the data analysis process. The level of detail supplied in a transcript often far outweighs that which would be available when listening to an event in real time. Transcripts also assist in *dissemination,* enabling a text-based record of an event which other researchers can engage with. This links to the transcript's role in *verification*. Having transcripts available for others to access allows any analysis based on transcript data to be open to scrutiny and possibly verified (or questioned) by others. The existence of transcripts also permits new RQs to be asked based on data collected.

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[3] Definition of 'turn' is taken from Vrikki et al. (2019, p. 14): "any contribution that begins and ends with a speaker switch or audience change".

4.12.4 Objections to transcription

Despite affordances of transcription, the process of transcribing spoken language has been questioned and critiqued for varying reasons. A fundamental issue with transcription of audio data is that it may not accurately represent the complex reality of the dialogue it intends to capture. (Similar criticisms are levelled at coding practices which may reduce reality into something easily measurable (Wegerif, 2020; Wegerif & Mercer, 1997)). For example, Bucholtz (2007) argues that transcription transforms something organic and dynamic into a fixed state. It has also been claimed that:

> Transcriptions are decontextualized, abstracted from time and space, from the dynamics of the situation, from the live form, and from the social, interactive, dynamic and fluid dimensions of their source; they are frozen (Cohen et al., 2018, p. 523).

The act of transcribing transforms events created in one rule system (oral and interpersonal) to another (written language), resulting in loss of data (Cohen, Manion & Morrison, 2018). Transcription is therefore not an objective tool to be employed by researchers. It cannot present an accurate reflection of what microphones intend to record: in this case, group dialogue. Rather, transcription offers a means of *re*presentation (Kvale, 1996), accompanied by difficulties that this can bring, but also offering several affordances in its position within the analysis process.

A seminal theorist on the use of transcription is Ochs (1979). She wrote at a time when critical reflection on the process of transcription was sparse. Particularly powerful was Ochs' argument that "transcription is a selective process reflecting theoretical goals and definitions" (1979, p. 44). Acknowledgement of the scope for subjectivity and interpretation within transcription and its theoretical basis represented important developments in understanding of this method. Along with many theorists since (Barron & Engle, 2007; Jenks, 2011), Ochs argued against the notion of transparency within transcription, instead, emphasising the need to recognise the various ways in which transcripts are produced out of researcher interpretation and reflect the researcher creating the transcript (Jenks, 2011). This links to Cohen, Manion and Morrison's argument that transcripts are "already interpreted data" (2018, p. 523).

By acknowledging these issues with transcription, a robust and publicly available record of dialogue can be created. Attempts to rigorously adhere to transcription conventions and to ensure accuracy in the transcripts created can help to avoid bias which might occur if such stringency is not taken. Attention will now move to consider how transcripts were used in this project, with details about the coding process provided.

4.12.5 The coding process

Analysis of transcripts investigated whether activities encouraged and evoked the targeted reasoning styles, and if so, to what extent. This required the use of a coding framework designed to operationalise, capture and measure discipline-specific reasoning. A number of frameworks for analysing reasoning and/or dialogue were considered (e.g. Boyd & Markarian, 2015; Kumpulainen & Wray, 2002; Nystrand, 1998; Sedova, Sedlacek, & Svaricek, 2016). Given the time taken to develop and evaluate a coding scheme, and the difficulties new schemes create when comparing outcomes with existing research, researchers tend to engage with existing frameworks where possible, with some even warning against starting from scratch (Tschan, Zimmerman, & Semmer, 2018). Nevertheless, some advise against using an existing framework without modification, unless it is perfectly suited to the research project and questions (Tschan, Zimmerman and Semmer, 2018). Demands to modify coding instruments pose problems for researchers (Tschan, Zimmerman and Semmer, 2018; Hennessy, Howe, Mercer, & Vrikki, 2020). While existing coding frameworks for analysing classroom dialogue were identified in this project, it became apparent that no existing coding scheme could be used without modification. This is because the framework of reasoning styles created in this project is original; the notion of reasoning styles in primary English has not been previously operationalised in the form of a coding instrument. Existing coding schemes were not able to answer the project's research questions.

4.12.6 Development of a coding instrument: Comparing CDAS with SEDA

Two coding frameworks potentially useful in this project and selected for further consideration were the Scheme for Educational Dialogue Analysis (SEDA) (Hennessy et al., 2016) (Appendix A) and the Cambridge Dialogue Analysis Scheme (CDAS) (Vrikki et al., 2019) (Appendix B). CDAS is a revised and

condensed version of SEDA. These frameworks were selected for consideration based on their focus on dialogue, dialogic moves and reasoning, with particular emphasis on educational dialogue. They also offer a fairly high level of granularity, although there are differences between the two frameworks in this respect.

The project originally intended to use the SEDA coding framework as it seemed suited to the purposes of this research given its focus on educationally productive dialogue and reasoning. This was developed in collaboration with researchers in Mexico and was based on an earlier scheme produced by Rojas-Drummond et al. (2013). Researchers involved in creation of SEDA intended to "attempt to represent and operationalise commonalities amongst some key theorists in the field concerning productive forms of educational dialogue" (Hennessy et al., 2016, p. 16). Although explored further in Section 2.7.1, major contributors to discussion around dialogic teaching and learning, including Alexander's (2001) principles of productive dialogue, form the basis of what is understood to be "dialogic" sequences in Hennessy et al.'s research. Other research drawn upon includes that of Bakhtin (1981), Mercer (2000) and Wegerif (2007). Seven main principles of what characterises *Dialogic Teaching-and-Learning* (DTL) (Rojas-Drummond et al., 2013) are identified in Hennessy et al.'s paper. Thus DTL: harnesses the power of language to promote understanding, thinking and learning; is collective, reciprocal, supportive, cumulative and purposeful; engages in 'social modes of thinking' collectively exploring possibilities, making reasoning explicit and framed by authentic open-ended questions/tasks; promotes inquiry with teachers as co-learners; celebrates new ideas and is critically constructive allowing for negotiation of perspectives; promotes environments supportive of diverse voices "allowing analysis, transformation and reconciliation of underlying points of view"; and questions traditional 'monologic' practices extolling one voice, primarily that of the teacher (Hennessy et al., 2016, p. 18).

SEDA is made up of thirty-three *communicative acts* (drawing on Hymes' *Ethnography of Communication*, 1972) divided between eight clusters. Communicative acts operate at the micro level and are "identified by their interactional function" (Hennessy et al., 2016, p. 18). According to Hymes (1972) and Saville-Troike (2003), communicative acts are embedded within *communicative events*, operating at the meso level. Essentially, communicative events are made up of a sequence of turns where participants, purpose and task remain constant. Communicative events are part of a broader *communicative situation* operating at the macro level and representing the general context for the communication (Hennessy et al., 2016). By focusing on the finely grained communicative act

and grouping the thirty-three which are identified in SEDA into eight clusters according to their function, Hennessy et al. (2016) hope that SEDA will allow identification of dialogic sequences. Turns are therefore coded only if they "contribute to the dialogic interaction" (Hennessey et al., 2016, p. 20).

After carefully reviewing SEDA, CDAS was shared with me in early 2018 by one of the SEDA scheme's authors (subsequently published by Vrikki et al., 2019). CDAS was developed by a team with many of the same members involved in the creation of SEDA. The thirty-three SEDA codes are replaced with twelve CDAS codes representing a marked decrease in the number of identified categories. Ten of the CDAS codes are termed "dialogic move codes" (Vrikki et al., 2019, p. 6) since the authors believe them to represent current views about productive forms of dialogue. Two additional codes (agreement (A) and other invitations (OI)) do not map so readily onto existing views about productive dialogue although the authors believe that when combined with other codes, they are able to reflect valuable dialogue. As would be expected from a framework based on an earlier version, there are parallels between SEDA and CDAS.

To assess the comparative utility of these coding instruments to the demands of this project, both schemes were used to code one transcribed lesson (a lesson promoting genre-based reasoning using the diamond ranking task structure). Any correspondences between codes used in SEDA and those used in CDAS (as well as any differences observed) were explored in a careful mapping process[4]. The purpose of this comparison was to explore the similarities and differences between the two frameworks, as well as their relative affordances. By evaluating what can be captured using each of the coding schemes, it was hoped that a more informed decision about the most appropriate choice of coding scheme for this project could be reached.

Selected coding framework

Each turn in the transcript from this project (a diamond ranking task designed to promote GRE) was coded using SEDA and CDAS. SEDA codes were then mapped against CDAS codes. Given that CDAS

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[4] A similar process was followed by Hennessy (2020), who coded one transcript using SEDA, Accountable Talk (Michaels & O'Connor, 2015) and Transactive Discussion (Berkowitz & Gibbs, 1983) to explore their affordances.

was developed from SEDA and created by many of the same researchers, it is not surprising that there were clear parallels between codes, or code clusters, in SEDA and those used within CDAS.

Following systematic comparison of the SEDA and CDAS frameworks, CDAS was selected as most useful to answer the specific research questions of this project. Essentially, CDAS was found to be more manageable with codes easier to apply. While providing many additional coding options within SEDA would seem to allow for enhanced precision, in practice, this may be difficult when working with real-life 'fuzzy' data and not examples created to illustrate and exemplify the framework. Despite enhanced simplicity, CDAS still contains the dialogue moves identified as important in SEDA.

Selecting between SEDA or CDAS would be influenced by the purpose of analysis and the level of detail a researcher believes can be identified or is required to fulfil their objectives. The RQs for this project require emphasis on reasoning. Although other CDAS categories were used when coding transcript data, the reasoning categories represent the primary focus of this project. The fine-grained focus of SEDA across all major dialogue functions was not therefore required in this project.

Despite focusing primarily on reasoning (and discipline-specific reasoning codes described below), coding and analysis will retain and use all other CDAS codes. This is for several reasons. First, CDAS engages with a wealth of research on productive forms of dialogue. Transcripts of student dialogue which attract a large proportion of CDAS codes can be considered as representing dialogic and educationally productive forms of talk. Although this project primarily aims to establish whether domain-specific reasoning in primary English can be elicited in student dialogue (RQ2), the importance of other dialogic functions is not ignored. Second, there is also the possibility of negative findings: it may not be possible to elicit, operationalise and/or measure domain-specific reasoning in this project. This would essentially provide a negative answer to RQ2. In this instance, recorded data from student discussion could still be investigated in terms of dialogic functions. This would permit consideration of task structure and exploration of the value of these tasks in promoting productive dialogue (or not). Third, even if domain-specific reasoning can be elicited and measured, it is important to know the dialogic function of turns not coded as domain-specific reasoning. For example, if high proportions of domain-specific reasoning are identified but all other turns are 'uncoded' and/or off-task, findings would not be as promising as if the majority of other turns also represent educationally productive forms of dialogue. This relates to the consideration within the

Literature Review and Discussion chapters about the value of dialogue and collaborative working generally. Thus, while the primary objective in this project is to investigate whether reasoning styles in primary English can be elicited in student dialogue, by permitting consideration of broader dialogic functions, the project can also comment on whether dialogue is educationally productive overall.

4.12.7 Development of discipline-specific codes

Despite enabling a closer and more precise focus on the talk moves most important to analyse discipline-specific reasoning, CDAS is still too general to be applied when coding the discipline-specific reasoning styles detailed in Study One. While CDAS contains codes for 'reasoning' and 'reasoning invitations', it is not able consider, operationalise and measure discipline-specific reasoning in English.

CDAS has therefore been extended in this project to include additional codes designed to capture domain-specific reasoning in English. To create additional codes, descriptions and definitions of the reasoning styles identified for primary English were critically considered and operationalised using a format similar to other codes in CDAS. Similar levels of description and detail accompany each additional code. The codes created for the three styles selected for empirical investigation (genre-based (GRE), language-based (LRE) and analogy-based reasoning (ARE)) are included in Table 4.1, alongside the general reasoning (RE) category in CDAS.

Table 4.1 Coding framework for discipline-specific reasoning styles in primary English

Codes	Key Words
Reasoning (RE) CDAS	Provides an explanation or justification of own or another's contribution, or speculates, predicts, hypothesizes with grounds given. E.g. (After 'He came back') 'because he made a promise' (Vrikki et al., 2019).
Genre-based Reasoning (GRE)	Provides an explanation or justification of own or another's contribution **based on specific genre features identified.** Refers to/draws upon conventions of genre and uses these categories to support the process of forming and justifying conclusions. Considers, compares and contrasts texts in relation to others within or outside of a given genre. Includes some or all of the general reasoning features described in RE but **must also contain a genre-based focus/element**.
Analogy-based Reasoning (ARE)	Provides an explanation or justification of own or another's contribution **by drawing analogies to other sources/images/characters/themes.** May make use of allusion, allegory, simile, metaphor. Identifies similarities and differences between two or more aspects during the process of comparison or contrasting. Such comparison is made explicit and is used to facilitate interpretation. Use of analogy needs to be central to the reasoning process and to the formation/justification of conclusions (otherwise RW (reference to wider context) should be used instead). Includes some or all of the general reasoning features described in RE but **must also make explicit use of analogy/comparison/contrast.**
Language-based Reasoning (LRE)	Provides an explanation or justification of own or another's contribution **by drawing on specific language and linguistic devices identified**. Consideration can be at word-level (e.g. vocabulary, word class features, repetition, onomatopoeia, alliteration); sentence-level (e.g. analysis of syntactical structure, use of rhetorical questions, pun, hyperbole, oxymoron, simile or figures of speech); or text-level (e.g. emotive language, personification, pathetic fallacy, metaphor, imagery, symbolism or irony). Features may operate at different levels (e.g. sentence and text-level) with different effects. Most likely includes close reference to the text, perhaps in the form of direct quotation. Includes some or all of the general reasoning features described in RE but **must also explicitly consider language/ linguistic devices when forming/justifying conclusions.**

4.12.8 Progression within reasoning styles

To extend the coding framework further, and to support its accurate application, student examples of engagement with the styles of reasoning were taken from transcript data. These formed a third column alongside each reasoning style within the framework. There was also some concern for progression within reasoning styles. Given that styles were developed partially from analysis of the

academic discipline and culture of English literature, there had to be some consideration of the ways in which these styles can be made accessible and useful to primary-aged students. To support a focus on progression, the Structure of Observed Learning Outcomes (SOLO) taxonomy (Biggs & Collis, 1982) was drawn upon (Appendix C). SOLO aims to identify level of understanding through consideration of the number and quality of connections drawn upon. Some exchanges identified as demonstrating discipline-specific reasoning were subject to analysis using SOLO. This permitted reflection on the levels of progression and understanding demonstrated by students involved in the project and enabled collection of illustrative examples of domain-specific reasoning ranked according to SOLO. The resulting coding instrument is based on CDAS, with additional codes added to capture domain-specific reasoning. Codes are accompanied by examples which are ranked according to the level of understanding demonstrated, based on SOLO (Table 4.2).[5]

This coding instrument operationalises ideas developed in the reasoning styles framework. Operationalisation could then be tested by me, as the researcher, and the project supervisor to ensure reliability in coding. Similarly, progression indicators based on ranked examples of student dialogue could also be tested on further data. If styles can be reliably identified and coded, future research investigating the concept of discipline-specific reasoning styles will be supported. Reliably establishing styles identified for English would demonstrate their distinctness and the possibility of realising them in the primary classroom. This would support the argument for explicitly focusing on teaching them in primary education. Focusing on progression indicators will also support teachers. If progression within individual styles can be reliably identified, teachers will be greatly supported in terms of how to introduce and pitch the teaching of reasoning gradually and progressively and will be supported in their assessment of discipline-specific reasoning. They would be supported to identify whether students are able to reason according to specific styles and how to assess the level of relational understanding exhibited.

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[5] Given the age of students involved in this study, there were few examples of domain-specific reasoning at SOLO's *extended abstract* level (see Appendix C). One example for language-based reasoning is included, but examples of this type of reasoning from the other two styles cannot be identified in the data collected.

Code	Key Words	Examples
Genre-based Reasoning (GRE)	Provides an explanation or justification of own or another's contribution **based on specific genre features identified.** Refers to/draws upon conventions of genre and uses these categories to support the process of forming and justifying conclusions. Considers, compares and contrasts texts in relation to others within or outside of a given genre. Includes some or all of the general reasoning features described in RE but **must also contain a genre-based focus/element**.	**Unistructural:** "If it [a fairy tale] wasn't in groups of three, it wouldn't make a difference." (Identified/named a feature of the genre and offered brief but undeveloped comment). **Multistructural:** "Happy ending should be in the middle [of the diamond ranking the importance of fairy tale features] because if you didn't have a happy ending it would just be a bit of a sad story and not for children." [Identified more than one relevant independent aspect (happy ending, fairy tales created for children)]. "Because if you have happily ever after, you know they're going to be happy and then if you have villain, like I said, it's always going to make the life a bumpy road". [Identified more than one relevant independent aspect (happily ever after, villain and the function of a villain in fairy tales)]. **Relational:** [Discussing the importance of a moral lesson] "Say for Red Riding Hood, the mother says stick to the path but don't go off the path otherwise you'll lose it and you might walk into strangers and you're not to talk to strangers and she went off that path and it teaches the people who read it…to listen to their mum and not to ignore her." [Understanding integrated into a structure where localised meanings for a specific fairy tale are extended/related to wider messages].
Analogy-based Reasoning (ARE)	Provides an explanation or justification of own or another's contribution or task decision **by drawing analogies to other sources/images/characters/themes.** May make use of allusion, allegory, simile, metaphor. Identifies similarities and/or differences between two or more aspects during the process of comparison or contrasting. Such comparison is made	**Unistructural** "I think that Kensuke is the odd one out because Michael and Michael's mother are family and they probably know each other better." "I think also Michael could be the odd one out because Kensuke and Michael's mother both took care of Michael." "They've all [Michael, Kensuke and Michael's mother] been on a ship." **Multistructural**

	explicit and is used to facilitate interpretation. Use of analogy needs to be central to the reasoning process and to the formation/justification of conclusions (otherwise RW should be used instead). Includes some or all of the general reasoning features described in RE but **must also make explicit use of analogy/comparison/contrast**.	"Kensuke could also be the odd one out because Michael and Michael's mother, well, they both went on a ship journey, whereas Kensuke didn't go on the ship journey and fall off. He just- Well, there was a storm, wasn't there?" "Kensuke and Michael both teach each other something as well…Because Michael teaches Kensuke how to speak English and Kensuke teaches Michael how to survive and he teaches him how to paint and stuff." **Relational** "I would choose Michael's mother, too, because Michael and Kensuke both have the same thing. They're both stranded. Like family or relatives have died, so they both have a similar story." "Maybe for Michael and Michael's mam that they were both, like, willing to give up their wishes to make Michael's dad happy…because Michael gave up Eddie and the Mudlarks to make his dad happy because they wanted to move down south, and then Michael's mam didn't want to move down south, but then she did just to make his dad happy. So maybe we should just put they both sacrificed things to make the same person happy."
Language-based Reasoning (LRE)	Provides an explanation or justification of own or another's contribution or task decision **by drawing on specific language and/or linguistic devices identified**. Consideration can be at word-level (e.g. vocabulary, word class features, repetition, onomatopoeia, alliteration); sentence-level (e.g. analysis of syntactical structure, use of rhetorical questions, pun, hyperbole, oxymoron, simile or figures of speech); or text-level (e.g. emotive language, personification, pathetic fallacy, metaphor, imagery, symbolism or irony). Features may operate at different levels (e.g. sentence and text-level) with different effects. Most likely includes close reference to the text, perhaps in the form of direct quotation. Includes some or all of the	**Unistructural** "Confused means, like, you don't know what's going on". **Multistructural** "Yes, because he was elated when he was on the hill when he saw how nice the island was looking, and then he was elated when he found out that Stella was alive." "[Unsure] because he didn't have any clue how he got on the island or how he's going to get off, or if he saw a ship how he was going to get the ship to come…Then he was unsure if he was going to survive because he had no food or water. Then, the only water he had was the sea, he was tempted to drink it, and if he did, he would've died because the sea's too salty for him to drink." **Relational** "Yes [Michael was determined] because he said it felt more than an expedition. An expedition is very long and hard, so then you would have to have determination for it, and you're climbing a mountain, so that would take a while. So, you would be determined throughout the whole thing."

	general reasoning features described in RE but **must also explicitly consider language and/or linguistic devices when forming/justifying conclusions.**	"No, because confused and unsure, I mean they basically mean the same thing, but if you're going to change one of them you have to change the other [so that they remain in aligned in the diamond structure]." **Extended abstract** "No [happy should stay towards the top of the diamond], because being happy is the most important thing. Looking at the bright side of something terrible is the most important thing."

4.12.9 Sub-question 1 conclusion

Sub-question 1 asked: can relevant reasoning in English literature be identified in children's language in primary classrooms? This has been addressed by critically reflecting on the use of audio recording to capture children's talk within small group tasks. The use of transcription to transform this into written form was then considered, with possible objections explored. The section then described the development of a coding framework to support analysis by enabling language to be coded according to its dialogic function (or lack thereof). This coding framework required creation of three additional codes to operationalise and capture discipline-specific reasoning in English. As mentioned previously, it is believed that the modification of the CDAS framework to operationalise specific styles of reasoning in English represents an original and important contribution to existing research. Finally, consideration was given to indicators of progression for each of the three reasoning styles selected for empirical exploration. Discussion will now turn to sub-question 2.

4.13   Sub-question 2

How do styles of reasoning in English relate to the task structures used to promote discipline-specific reasoning?

A broad aim of this project is to explore whether it is possible to promote specific styles of reasoning in primary English lessons. An important aspect of this rests on the development and use of appropriate tasks to scaffold domain-specific reasoning (see Section 2.7.4 for discussion of

scaffolding). It was therefore necessary to give careful and critical consideration to potential task structures.

Given the project's requirements for collaborative group work which promotes reasoning, criteria for selecting task structures focused on their capacity to promote extended discussion and reasoning. It was therefore necessary that task structures selected are:

- Adaptable: to more than one reasoning style and to a range of contexts (including topic, year group, ability range);
- Open-ended: to facilitate authentic exploration of ideas where there is not a single 'correct' answer or approach, which are supported by careful reasoning and are subject to debate;
- Accessible: readily understood by teachers and most or all students across KS2; limited demand in terms of resource and preparation time required.

A range of task structures were considered prior to the formal exploration phase of the study. Important sources drawn upon to facilitate exploration of suitable task structures included materials produced by the Thinking Skills research team at Newcastle University (Higgins, 2001; Leat & Higgins, 2002). Several pedagogical task structures are explored in these materials. Some were used in the piloting phase of this project to enable 'testing' of their utility and fitness for purpose against the criteria developed to aid task selection. Affordances and constraints of each task structure were considered alongside the framework of reasoning styles to ascertain which might be most useful to scaffolding of particular styles. Consideration was also made regarding the potential adaptability of task structures to more than one style of reasoning. This was important since this project seeks to promote styles of reasoning in English which are distinct and operationalisable. By using the same task structure to promote more than one style of reasoning, opportunities to compare across both task structures and reasoning styles were made possible. Evaluation of potential task structures and informal piloting represented important stages in the process of selecting task structures.

After piloting, four task structures were selected for the formal investigation. They were selected based on their capacity to scaffold and promote extended discussion, thinking and reasoning (Higgins, 2001). They are also adaptable to content and genre within primary English, and to age and ability of students. Moreover, piloting demonstrated their accessibility to students in KS2; with limited instruction and demonstration from a teacher, all students were able to participate in the

tasks. Student confidence and competence were strengthened through repeated engagement with these structures, applied in varying contexts and to promote different reasoning styles. The four selected task structures will now be detailed.

4.13.1 Odd One Out
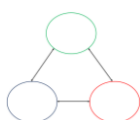
This activity focuses on and supports students' ability to sort and classify. It requires consideration of similarities and differences between a given set of items with the goal of deciding which of a set are similar and can be grouped and which is the 'odd one out' based on its dissimilarity to the other group items.

There are several formats of this activity. In its most basic form, students are presented with three items. Students discuss similarities and differences before deciding which item is *odd*. A more systematic approach employing a triangle format (see figure from Higgins, 2001, p. 15 and image alongside this section heading) requires recording of similarities through use of arrows between any two items in the triangle. Differences can be noted around the outside of a given point in the triangle, located beside the specific item which is distinguished in some way from the other two. This format should also support students' ability to identify alternative solutions to the *odd one out* problem. (It is the open-ended nature of odd one out, as it is used in this study, which departs from the way in which odd one out problems are typically used in Intelligence Quotient (IQ) tests and similar (see e.g. Sinapov & Stoytchev, 2010)).

Another variation of *odd one out* is to present items in a grid with a range of items within grid cells. Students form groups from the items, based on some identified similarity which distinguishes the group from other items or groups. Again, this focuses on classification and requires students to compare and contrast items before arriving at a decision. It can be used to extend consideration from three items, of which only one can be odd, to requiring the formation of several groups, which must be distinguishable from others, or to selecting one odd item or group from a larger set of items.

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The basic procedure of *odd one out*, despite variations, requires the following stages, presented in Higgins' *Thinking Through Primary Teaching* (2001) and adapted here specifically for English:

1. Present students with three items e.g. characters, genres, features of a genre/text, words related to a text, linguistic features.
2. Ask them to identify similarities and differences.
3. Ask students to choose an 'odd one out' and give a reason.
4. Encourage them to identify a corresponding similarity for each difference (e.g. if Cinderella is the odd one out because she is from a modest background, Snow White and Sleeping Beauty are similar in that they are both royalty).
5. Encourage a range of answers.

Step 4 is important in that it requires explicit consideration and articulation from students of similarities between the two remaining items, rather than just a difference in the odd one selected. It should support them to select carefully considered 'odd' items, hopefully developing stronger justifications for their task responses. An extension of this activity would require students to suggest an additional item to join the similar group (in the three-item format) or with each group (in the table format). This would encourage engagement with principles and structures underpinning their groupings. Students might also create their own *odd one out* problems related to a particular topic or text. This would give teachers insight into classifications drawn on by students. Teacher modelling of what makes a good response to *odd one out* is important. They can help to steer students away from identifying superficial answers, or answers which are arbitrary in relation to the subject (e.g. Cinderella is the odd one out because her name has only one word, whereas Snow White and Sleeping Beauty each have two words in their name). Such superficiality detracts from engagement with features such as character and genre, which may be more important considerations in English lessons.

Odd one out has many advantages. Although considered in relation to English here, it can be used across the curriculum (see examples of its use in mathematics, science and geography in Higgins (2001)). It requires minimal preparation time and is easy to explain to both teachers and students. It is suitable across the school age range and is an engaging activity which does not require extensive written work (although its potential in this endeavour is explored by Oliver (2020)). *Odd one out* encourages development of a key mode of thinking, classification, and facilitates group discussion by

giving a real purpose for classroom talk. The activity encourages students to develop a more precise vocabulary in English. It requires careful thinking and reasoning, both from students and teachers and while it is open-ended, it can be approached systematically.

4.13.2 Fortune Lines
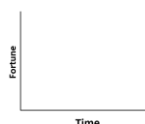
Fortune lines focuses on interpretation and organisation of information using a graphical structure. This activity facilitates understanding by 'chunking' information and then requiring systematic engagement with these 'chunks' (Higgins, 2001). Interpretations of information/events are organised and recorded graphically, with time forming the x axis, and fortune (or emotion) forming the y axis. This means that students must deal with and consider two aspects of information simultaneously: chronological sequence and an aspect such as changing fortune or emotion (Higgins, 2001). In the process of this activity, students may have to decide which key events to present in the graph. However, providing pre-written statements detailing events to be included as time points in the graph removes the need for students to recall events.

When used in English lessons, students could consider a character or group of characters and reflect on their changing fortunes over time. A modification in this project required students to track the fortunes of more than one character. This manifested in different ways. For example, students used fortune lines to compare characters from more than one text within a graph (e.g. The Lady of Shallot and Rapunzel). Students completed the fortune line for each character in turn and then used the completed graph as a basis from which to compare the fortunes of different characters. These characters were carefully selected based on their level of similarity and because of their comparable trajectories which still allowed for consideration of differences. This modification was designed to prompt the analogy-based reasoning style. Another example tracked and compared characters from the same text. Students were encouraged to track the fortunes of both characters for different stages of the text (e.g. both at the beginning, then after a major event). This version meant that students were comparing throughout, rather than after both fortune lines had been completed (see Section 5.2.3).

Fortune lines has several advantages. It requires and develops skills of sequencing, interpretation of texts and events, linking information, explaining and justifying reasoning, and organising and presenting information in different visual formats while linking this to two different frames (time and fortune on the two axes) (Higgins, 2001). It is engaging and provides a meaningful purpose for discussion. *Fortune lines* requires minimal preparation and can be readily managed within the classroom. It can be used across the age and ability range with modifications (e.g. more or less complex sequencing; altering the level of difficulty by assigning positions in the graph, providing time points or key stages for students to base their plots on). Students consider the changing fortunes of a character, deciding the weighting and relevance of events or information. All decisions should be explained and justified which is greatly facilitated by conducting *fortune lines* in pairs or small groups. Teachers can observe student reasoning and can develop this further with targeted questioning/feedback. *Fortune lines* can be used to prompt and probe different styles of reasoning (see White & Gunstone, 1992).
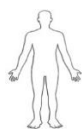
4.13.3 Role on the Wall

Role on the Wall presents students with an outline of a figure representing a particular character. Students use spaces both inside and outside of the figure to record important aspects relating to the chosen character. *Role on the Wall* can be used in several ways. The inside of the figure can describe a character's thoughts, feelings or personality. This portion is often used to target the 'inner' life or qualities of a character. The outside of the figure can also be used in different ways, depending on the text, character or learning objectives. For example, students could record physical characteristics of characters around the outside (perhaps considering tensions or harmonies between inward and outward qualities). Alternatively, the outside could be used to record environmental sources which affect the character, particularly in terms of their inner lives (such as life events, relationships or personal hardships/triumphs contributing to emotions or personality traits). Alternatively, the outer portion of *role on the wall* can be used to record descriptions of a character according to perceptions held by others. Again, this may or may not correlate with what is recorded in terms of their inner

qualities. Another variation would be to use the outside space to record questions readers wish to ask a character, which might form class discussion points.

This task structure can be used as a whole class activity, with a large 'role' displayed 'on the wall' of the classroom. This would be added to over the course of reading and completed as a shared class activity. *Role on the wall* can also be used by individuals, pairs, or groups. It can form a one-off task to reflect upon aspects of a character in depth. Alternatively, it can be added to over time, deepening understanding of a character and reflecting on what knowledge, impressions and understandings are gained over the course of a text. Alternatively, multiple 'roles' or figures can be completed to compare characters according to their inward and/or outward qualities.
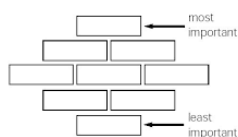
4.13.4 Diamond Ranking

Diamond ranking, sometimes referred to as *diamond 9's*, is a task structure used to facilitate ordering or ranking. The task presents nine boxes organised in a diamond layout with nine items to rank usually provided. Items are commonly statements, but may also be objects, images or photographs (e.g. Niemi, 2015). Students must sort and rank these items, in terms of importance or interest (Clark, 2012), or according to context/content-specific criteria. The top space in the diamond is reserved for the item deemed most important and the bottom space is for the item considered least important (if importance is the general ranking criteria for the diamond). The second and fourth rows of the diamond have space for two items alongside each other and the middle row has space for three (although there are variations in terms of size and number of spaces in some versions of *diamond ranking*). Items presented adjacently might be considered of equivalent importance. The diamond therefore removes the need to rank in a linear fashion, instead requesting only most and least important aspects are identified with space for some equivalence and similarity within the diamond. As in the other three task structures discussed here, there is no 'correct' solution with *diamond ranking* tasks. Rather, the process of discussion, debate and reasoning is promoted and valued.

It has already been suggested that the size of the diamond may be modified to make the grid smaller (for instance, by removing the second and fourth rows thus leaving a diamond with one each at the top and bottom and a middle row of two or three) or larger (by adding additional rows to the middle of the diamond) depending on task requirements. A further modification to *diamond ranking* might present students with more items than the nine to be contained in the diamond. Students must then decide which items to leave out of the diamond completely.

Diamond ranking has several benefits. Firstly, it represents a useful stimulus for discussion and debate (Clark, 2012; Niemi, Kumpulainen, & Lipponen, 2015; Rockett & Percival, 2002; Woolner et al., 2010) and has been identified as a thinking skills tool (Rockett & Percival, 2002). Students are required to explicitly consider the importance of items and are therefore prompted to explain and justify decisions made, particularly when the task is conducted in pairs or small groups. In addition, it is a novel, engaging and motivating task structure (Baumfield, Hall, & Wall, 2013; Niemi et al., 2015). This task requires minimal preparation and can be readily understood by teachers and students. *Diamond ranking* is also suitable for a range of abilities and ages, particularly when it is modified. For example, younger children or struggling readers might be given pictures rather than written text; the level of conceptual difficulty related to items or the focus of a *diamond ranking* task could be adapted; or the criteria for ranking could be omitted so that students must decide on what grounds they will rank their items.

4.13.5 Sub-question 2 conclusion

Sub-question 2 asks: how do styles of reasoning in English relate to the task structures used to promotes discipline-specific reasoning? This question has been addressed through careful and critical consideration of potential task structures evaluated against criteria guiding their selection. Thus, all four structures considered here are adaptable, open-ended and accessible (the criteria for task selection presented in Section 4.13). Findings presented in Section 5.2 will consider differences in discipline-specific reasoning based on task structure used.

4.14 Potential limitations of Study 2

There are several potential limitations of this empirical study. These are based mainly on the exploratory and small-scale nature of the study, the research design employed, the opportunistic sampling strategy and use of a single researcher. These compromises are necessary given the exploratory nature of the research. However, it is important to reflect on potential issues and to consider the possible impact on data collected.

4.14.1 Research Design

One limitation of this research is that descriptions and inferences about a wider population cannot be made. The non-experimental design and lack of random sampling mean that inferential statistical methods have not been employed (Gorard, 2014, 2018; White & Gorard, 2017). Tasks used were non-comparable and groups were naturalistic. The support received by groups also varied. Because of these differences, I could not be confident that variation in frequencies did not relate to other inconsistencies and so inferential statistical methods were considered inappropriate. This limits the extent to which main findings can be applied more generally, and beyond the sample involved in this study.

However, an experimental design was not required or appropriate for this exploratory study. There is limited prior research into the concept of reasoning styles generally, and particularly when the concept is applied to the domain of English. This project aimed to establish whether domain-specific reasoning in English can be elicited in student dialogue and reliably coded. To meet this intention, proportions of domain-specific reasoning were reported (a type of descriptive statistic) and these were supplemented with qualitative transcript data. This enabled description and exemplification of the reasoning styles framework; a fundamental requirement at this stage in the research cycle. The exploratory research conducted in this project therefore represents a "hypothesis-generating" study (Cohen et al., 2018, p. 850). It paves the way for future experimental research designs using random sampling methods (thus permitting the use of inferential statistics) (see Section 7.5).

4.14.2 Sample

The sample in this project can be described as a non-probability or convenience sample. Schools were selected opportunistically by me, based on voluntary participation and accessibility. Claims towards wider generalisability of findings cannot therefore be made. The sample size (two schools, five classes) may also be considered a limitation of this study. It cannot be claimed that these classes are representative of any other classes or schools and it is possible that a larger sample would have yielded greater variability in findings. While it is acknowledged that the sample is not likely to represent the wider population of primary schools (Cohen, Manion, & Morrison, 2018), sample size was informed by "fitness for purpose" (Marshall & Rossman, 2016, p. 108). "Rich and relevant information" (Flick, 2009, p. 123) was sought, in line with project intentions and research questions. Data collected from the sample aimed to provide a preliminary indication of whether reasoning styles from the framework created are realisable in the primary classroom, with data exemplifying these styles in optimum, rather than representative, conditions.

Given the small, opportunistic sample, it is acknowledged that the sample is not likely to represent the wider population of primary schools (Cohen, Manion, & Morrison, 2018). Despite these limitations, because the study is exploratory, generalisable findings were never required nor sought in this project. The study aimed to investigate whether styles of reasoning for primary English could be observed and delineated in the academic culture of English literature, in combination with curriculum materials for the primary stage. These styles were described in a framework of reasoning styles, targeted using scaffolding activities and then observed and measured in student dialogue. Optimum, rather than representative, examples of student engagement with these reasoning styles were sought. These informed the reasoning styles framework and the discipline-specific coding instrument. They also indicated directions for further research. Because probability sampling and claims to generalisability were not required, non-probability or opportunity sampling represented a practical, cost-effective and adequate strategy to meet the intentions of this project. The potential for further research, using more robust methods with a concern for generalisability, was also anticipated from the outset. Since the research content and theoretical underpinnings explored in this study are underdeveloped in existing research, this smaller-scale exploratory project represents a necessary early stage in the research cycle.

4.14.3 Use of a single researcher

Use of a single researcher also represents a limitation of this project. Based on analysis described in Study One, I created the framework of reasoning styles which the empirical phase of the project rested upon. I also created the coding framework to operationalise and measure the frequency of these reasoning styles in student dialogue (as well as coding other types of dialogue move). In addition, I was involved in the data collection process, working with one group in each of the recorded activities. Close involvement in all stages of the project may be problematic in several ways. Firstly, it is possible that had another researcher created a theoretical framework of reasoning styles for primary English, they might have included different categories, particularly if they had focused solely on the academic culture of English literature or curriculum documents. It is acknowledged in this thesis that claims are not made regarding the objective or exclusive 'existence' of reasoning styles described (see Section 3.2.2). The five styles described in this project are presented as what has emerged from the analysis undertaken. Validation of these reasoning styles is required from future research. Production of the framework was guided by strict criteria which managed and enforced rigour on the selection and inclusion process. The result of this conceptual enquiry is the classification and description of domain-specific reasoning styles with educational significance.

Secondly, use of a single researcher to create the coding instrument used to analyse transcript data may be a further potential limitation. However, this concern is mediated in several ways. First, the coding framework was developed from an existing coding tool underpinned by extensive research (Hennessy et al., 2016; Vrikki et al., 2019). Addition of extra categories to capture domain-specific reasoning followed the same format as that used in Vrikki et al.'s (2019) CDAS framework and clearly relate to the 'reasoning' category in CDAS. Second, data was coded with concern for reliability and consistency. Thus, after all transcripts had been coded (initially in order of when the activity was conducted), samples of coding were assessed by me, as researcher, several times. Sample extracts from across targeted reasoning styles and task structures were re-coded blind: initial codes ascribed to student turns in the first coding phase were hidden, so that I could check for consistency in my coding over time. This helped to clarify boundaries and potential overlaps between codes. In addition, sample extracts were grouped according to reasoning style promoted and then according to task structure used. These were again re-coded blind in these groups to check for consistency in

coding. These measures support confidence in the consistency of my application of the coding instrument. Further research might recruit additional coders to assess the inter-rater reliability of the coding framework, perhaps using Cohen's kappa coefficient statistic. Time and resource limits in this project prevented the recruitment of additional coders yet it is worth noting that the value of testing inter-rater reliability has been questioned, particularly on the basis that it implies that researchers not familiar with a project's context can reliably code using a framework created by others (Hennessy et al., 2020; Lefstein, Snell, & Israeli, 2015; Sedova et al., 2016). While additional coders from outside of the project were not used, coding was shared with the project supervisor, who critically considered and engaged with the coding undertaken in the project to ensure rigour. Selected transcripts were coded by both me and the supervisor with critical comparisons made.

Thirdly, my role as researcher working with some groups involved in the project's data collection phase may also be problematic. I worked with a group for each of the recorded activities. This was analysed and discussed in the thesis in terms of presence of adult support. Yet it is important that my role is not equated with that of a class teacher or indeed another adult who may be present in a classroom. Students knew that I was conducting research and had consented to participate in this research (parental opt-out consent was obtained as described in Study Two, yet students were also made aware of research aims and what their participation would involve. They were also assured of their right to withdraw participation at any time). Students knew that activities were audio recorded and would then be transcribed and analysed. It is possible that such awareness affected student responses within collaborative tasks. Knowledge of involvement in research and researcher's presence are commonly documented concerns of empirical research (see consideration of 'reactivity' bias below and in Section 4.14.4). The group working with me may have responded differently than if they had been working independently, or with their class teacher.

Several steps were taken to minimise potential issues related to reactivity bias. I worked with both schools for a period of approximately one year (from the observational phase, through piloting and finally through data collection). This time meant that students became familiar with me, and were accustomed to my presence in the classroom, particularly during English lessons. I also worked with small groups on numerous occasions before the recorded part of the study commenced. Again, this helped to ensure that students were used to working with me and knew what to expect from such scenarios. I did not notice a difference in the types and level of response from students when microphones were introduced to capture their discussion compared to responses during the non-

recorded piloting phase (although it is possible that changes did occur). Although taking a different role in this project, I am an experienced primary school teacher, and while I was not acting in this capacity, students were aware of my background. My experience is likely to have meant that my behaviours, questioning strategies and other pedagogical decisions were in line with what students have come to expect in primary education. Such steps demonstrate how the problem of reactivity bias was mitigated in the researcher-supported groups.

To address concerns of reactivity bias further, independent groups were also used. Use of an independent group supported comparisons between both group types and reduced my potential influence (as researcher) on overall findings. While the independent group were still aware of their involvement in research, aspects of the researcher which may have influenced the researcher-supported group would not have affected groups working independently. The two main group types meant that the researcher-supported group represented an optimised condition, with the likelihood of the group demonstrating domain-specific reasoning enhanced. Yet use of a comparison group working independently meant that analysis was able to consider whether students depended on support from me, as the researcher, to engage in domain-specific reasoning. Findings suggest that proportions of domain-specific reasoning were usually higher in researcher-supported groups than those observed in groups working independently, yet independent groups still demonstrated domain-specific reasoning.

4.14.4 Potential risks of bias

Cohen, Manion and Morrison (2018, pp. 560-561) identify twelve potential risks of bias from observational research. Many of these have been alluded to above. Potential risks were reflected upon from the beginning of the research process, with ways to remove or mitigate such risks affecting research design choices from the outset. These forms of bias will be briefly defined alongside consideration of ways in which they were mitigated in this study.

Selective attention relates to the observer and individual characteristics determining where attention is placed. This was addressed by audio recording two pre-selected groups. These groups were changed for every new recording/activity. Recordings were then transcribed.

Reactivity refers to the possible change in participant behaviour because of knowledge about being observed. This was mitigated by including a long period of involvement with schools and classes prior to the formal recording phase (see above).

Attention deficit relates to the possibility of the researcher missing an event. Recording student discussion (even in the researcher-supported group) helped to mitigate these concerns.

Validity of constructs relates to the question of whether indicators used to describe the behaviour of interest are valid indicators of that behaviour. Use of a pre-existing and validated coding instrument (CDAS; Vrikki et al., 2019) which included a category for reasoning helped to ensure that reasoning was targeted during coding. Efforts to ensure consistency in coding of domain-specific reasoning (detailed above in Section 4.14.3) strengthen confidence in the validity of these constructs.

Selective data entry relates to the possibility of recording being affected by personal judgement rather than the phenomenon under investigation. Since recordings were transcribed (and these transcriptions were checked), they were available to refer to at any stage in the research process by me and the project supervisor. Efforts to ensure consistency in coding described above (Section 4.14.3) helped to avoid this form of bias.

Selective memory refers to the possibility of the researcher forgetting details of observations. I kept a detailed record of contextual factors (such as date, school, reasoning style targeted, task structure used). This was always recorded immediately (often before the task took place). The teacher upfront portions of lessons were recorded to act as memory aids if required. Student work (such as fortune line charts or diamond ranking grids) was photocopied and kept with contextual records. Recording group tasks removed the need to remember details of student discussion (and reasoning practices exhibited).

Interpersonal matters and counter-transference refers to the possibility of the researcher's interpretations being affected by judgements and preferences relating to participants. By adopting a reflexive approach and ensuring an appropriate distance was maintained between myself, as researcher, and students involved in the project, these concerns were mitigated. Recordings and transcripts were also discussed with the research project's supervisor.

Expectancy effects relates to the possibility of the researcher's expectations influencing findings. These effects were considered when reflecting on potential limitations. Sharing transcripts and coding with the project supervisor and 'blind' re-coding of transcripts (without previous codes visible) helped to address these concerns.

Decisions on how to record refers to the need to record all group members displaying a behaviour (e.g. discipline-specific reasoning). This was addressed by audio recording and coding transcripts at the turn level with separate turns used for different speakers.

Number of observers refers to the need for consistency in judgements between different observers. Again, sharing transcripts with the project supervisor and critically discussing the coding process and decisions helped to address these worries.

The problem of inference refers to the difficulty of judging intention through observational methods. As mentioned, I (as researcher and observer) was not relied upon to record inferences or observations since discussions were audio recorded. Interpretations of subsequent data were discussed with the project supervisor.

Difference of interpretation of, and data aggregation and conclusions from, the same data refers to the possibility that individual traits of the researcher influence how they deal with and infer from data collected. Measures mentioned above, such as audio recording, transcription and close working with the project supervisor helped to mediate these concerns.

4.15 Conclusion

The research question guiding Study Two (can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?) sought to explore the possibility of promoting specific reasoning styles in primary English lessons with the support of scaffolding tasks. To address this question, it was necessary to capture students' reasoning through a process of audio recording and transcription. As reflected on in Section 4.12, this was not a fully objective process and is not a method purporting to capture a 'true' impression of 'reality'. Rather, transcription represented an early stage in the process of analysis. Development of a coding instrument designed to capture specific reasoning styles in English represents an original contribution to the field of research. It also permits quantitative analysis which is used to supplement the qualitative evidence taken from transcripts. Sub-question 2 focused on the scaffolding tasks to be used when promoting domain-specific reasoning. Tasks were clearly described and considered in terms of the thinking skills they are likely to promote.

This chapter has therefore presented the main methods used to address the second research question (including the two sub-questions). It has detailed the processes of creating a coding framework and selecting task structures, and has discussed other important considerations, such as ethics, sampling and the main stages of the empirical phase (observational stage, piloting, formal exploration). While attempts at transparency have been made, it was important to reflect on potential limitations of the methodology used. Although there are limitations to primarily observation-based methods with a small non-probability sample, these were mitigated wherever possible. Throughout the project, decisions and compromises were carefully considered in terms of implications (particularly to research outcomes). While steps to mediate limitations have been taken wherever possible, it is important to emphasise that this study is exploratory. This does not mean that there was not concern for rigour and robustness throughout. Although measures to ensure confidence in the project's findings have been taken, ultimately, findings and conclusions are presented as indicative, rather than conclusive.

The next chapter will present results obtained in this investigation, accompanied by an analysis of main findings.

5   Results and Analysis

Study One addressed the project's first RQ: *what styles of cultural reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?* Section 3.1.4 details criteria which guided creation of the framework of reasoning styles for primary English. This section clearly demonstrates the steps taken to ensure that the framework was developed from careful and rigorous analysis and reflection. These criteria permitted critical evaluation of the reasoning practices observed in the academic domain of English literature and with importance and relevance for the primary English curriculum. The resulting framework of reasoning styles thus demonstrates academic and theoretical support, internal coherence and applicability to primary English. Furthermore, the main ideas are communicable to schools and teachers.

Study One was therefore able to establish a theoretical framework of reasoning styles to be explored empirically as part of Study Two. Findings and analysis from the empirical investigation in Study Two will be presented here. Ultimately, the combined findings of Study One and Study Two suggest that reasoning styles for primary English can be both exemplified theoretically and realised empirically. Empirical findings will now be presented.

The project's second RQ asks: can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching? Findings will be divided into three main strands in this chapter. The first will focus on establishing whether data indicates that the three reasoning styles targeted during the formal exploratory phase of the investigation are realisable in student dialogue. Following explicit targeting of individual reasoning styles, this section will explore whether these styles were empirically captured and if so, in what proportions. The second strand will explore whether there was any variation in proportions of discipline-specific reasoning according to the specific task structure used. Some task structures may have an increased likelihood of promoting discipline-specific reasoning or may promote higher proportions within particular styles. The third strand will focus on variation in proportions of discipline-specific reasoning according to whether adult support was received. This section will compare findings from groups supported by myself, as the researcher, and those working independently.

A couple of important points must be made prior to presenting results. Discussion of domain-specific reasoning will present results from groups who worked with myself, as the researcher. Reflections on variations found between groups with different levels of support (researcher-supported or independent conditions) will be presented in a separate section of this chapter (5.3). Data for the researcher-supported groups was used within reasoning styles-based reflections for several reasons. Firstly, data for this group is available for all lessons. This is not always the case for groups working independently, for a number of reasons (see Section 7.2.1). In addition, responses coded as demonstrating discipline-specific reasoning were typically higher and more likely in the researcher-supported group. This study does not seek to offer generalisable or representative findings and is largely exploratory in nature. Discussion typically draws upon the highest quality examples from an optimal context by basing consideration within researcher-supported group transcripts. This allows illustration of the potential to promote domain-specific reasoning in primary English as well as providing exemplification of what this might look like in practice. Such findings pave the way for future research.

In addition, data will distinguish between proportions found when all CDAS codes are considered and when the four potentially overlapping codes have been removed from analysis (agreement (A), querying (Q), reference back (RB) and reference to wider context (RW)). These were available as 'secondary' codes to supplement a primary code. As a result, including these four codes in analysis may sometimes skew overall proportions reported, particularly when utterances were sometimes allocated three codes. For example, in some of the activities, instances of dialogue coded as agreement (A) were high, but this code often appeared in conjunction with other codes (including reasoning codes). If these secondary codes were retained when calculating overall proportions, the amount of dialogue serving other functions may have been masked. Both sets of results (both including and excluding the four secondary codes) will therefore be reported and considered. It is also important to acknowledge the capacity of some CDAS codes to 'trump' others. For example, if a turn was allocated both elaboration (EL) and reasoning (RE) codes, RE trumped EL. These prioritisation rules may affect frequencies and therefore proportions of some codes, which may downplay their role in dialogue captured in this project (Hennessy et al., 2020). However, since these prioritisation codes do not affect the domain-specific reasoning codes created for this project, (or the general reasoning code), these rules will not have had notable impacts on findings related to disciplinary-specific reasoning. Prioritisation rules also apply to every transcript which means that comparisons between transcripts can still help to illustrate comparable proportions of dialogic move across reasoning style promoted and task structure used.

5.1 Occurrence of domain-specific reasoning styles in Primary English

This project considers domain-specific reasoning in primary English and explores whether these styles can be realised in student dialogue with support from scaffolding tasks. As mentioned, Study One established a theoretical basis for the framework of reasoning styles. For the framework to be of practical value in primary education, it is important that these theoretical styles can also be realised in the classroom. Promisingly, evidence from the empirical phase of the project suggests that the theoretical reasoning styles described in Study One can also be realised in practice in the classroom. Evidence to support this finding will now be shared.

5.1.1 Genre-based reasoning (GRE)

All four task structures were employed with the intention of promoting genre-based reasoning (GRE). These lessons occurred across two schools and between three different classes and year groups (years 4, 5 and 6). Evidence from tasks designed to promote GRE largely support the argument that there are distinct and operationalisable styles of reasoning in primary English. There are some nuances within these findings which will be discussed.
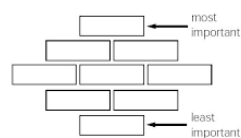
5.1.1.1 Diamond ranking

Two lessons in two schools used the diamond ranking task structure with students from year 4 in School A, and year 5 in School B. While full comparisons between age groups cannot be considered in the scope of this project, particularly given the limited sample, future research might reflect on the influence of age on the level of discipline-specific reasoning observed.

The lesson in School A (year 4) coded 19% of turns as GRE when secondary codes are included in analysis (Table 5.1), and 24% of turns as GRE when potentially cross-cutting codes are eliminated

from consideration (Table 5.2). A further 4% or 5% of turns were allocated the more general reasoning (RE) code. The proportion of GRE was second only to the elaboration (EL) code (29% when all codes are included, 37% when overlapping codes are removed). The large proportion of EL, and invitations of EL (ELI; 14% or 18%), provide evidence of the dialogic nature of the group discussion. This is supported by the very low proportion of 'uncoded' turns (2%). While it might be expected that discussion remain focused in a group working with a researcher, the low proportion of uncoded turns was also found in independent groups (see Section 5.3). Although promoting dialogic discussion was one goal of these collaborative activities, promoting domain-specific reasoning was the key objective, which seems to be evidenced by the promising proportion of GRE identified.

Table 5.1 Diamond Ranking GRE School A

Code	Frequency of instances	% instances
ELI	18	14%
EL	37	29%
REI	10	8%
RE	5	4%
GRE	24	19%
LRE	0	0%
ARE	0	0%
CI	1	1%
SC	1	1%
RC	0	0%
A	18	14%
Q	4	3%
RB	4	3%
RW	0	0%
OI	3	2%
UNCODED	2	2%
Total	127	

Table 5.2 Diamond Ranking GRE School A (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	18	18%
EL	37	37%
REI	10	10%
RE	5	5%
GRE	24	24%
LRE	0	0%
ARE	0	0%
CI	1	1%
SC	1	1%
RC	0	0%
A		
Q		
RB		
RW		
OI	3	3%
UNCODED	2	2%
Total	101	

School B demonstrated an even greater proportion of GRE in the diamond ranking task. This might have been partially influenced by the age of students in the class at School B (year 5), as well as many other potential variations between participants, schools, teachers and the lesson context. 25% of turns were coded as GRE in this particular task when all CDAS codes are considered (Table 5.3), or 33% when the four overlapping codes are removed (Table 5.4). No utterances were allocated the

more general RE code. This provides strong evidence of the potential to promote and capture domain-specific reasoning, as well as to operationalise it in coding. In this example, GRE received the greatest proportion of utterances, with EL second (22% or 28%).

Table 5.3 Diamond Ranking GRE School B

Code	Frequency of instances	% instances
ELI	21	8%
EL	55	22%
REI	17	7%
RE	0	0%
GRE	65	25%
LRE	3	1%
ARE	0	0%
CI	5	2%
SC	3	1%
RC	1	0%
A	53	21%
Q	5	2%
RB	1	0%
RW	0	0%
OI	9	4%
UNCODED	17	7%

Table 5.4 Diamond Ranking GRE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	21	11%
EL	55	28%
REI	17	9%
RE	0	0%
GRE	65	33%
LRE	3	2%
ARE	0	0%
CI	5	3%
SC	3	2%
RC	1	1%
A		
Q		
RB		
RW		
OI	9	5%
UNCODED	17	9%

The large proportions of GRE in the diamond ranking tasks across both schools can be exemplified by observing lesson transcripts. Quantitative data obtained through coding helps to capture an overall impression of the functions of talk moves across an activity. This can be juxtaposed with extracts from student dialogue, which exemplify discipline-specific reasoning. The extract below (Table 5.5) is from the diamond ranking activity to promote GRE in School B. Students were given cards naming features of fairy tales which they had to place within the diamond ranking grid according to how important they considered each feature to be within the fairy tale genre.

Table 5.5 Extract from DR lesson to promote GRE School B

Turn No.	Speaker	
1	Student 2	*I think we should move 'happily ever after' further down and bring one of these up.*
2	Student 1	*This one up?*
3	Student 2	*Yeah. And then this one down.*
4	Student 1	*'Marriage/ falling in love' up... 'Happily ever after' down.*
5	Student 2	*...Because like these three ['villain and threat', 'hero and heroine' and 'marriage or falling in love'] really like make a difference to the plot and the story line.*
6	Researcher	*So 'villain and threat', 'hero and heroine' and 'marriage or falling in love', those three would make a difference to the plot? [Verbalises student gestures to specific features for the benefit of the audio recording].*
7	Student 2	*Yeah. Because like 'villain', like if there wasn't a villain, everyone would just live an easy life and it wouldn't be very interesting.*
8	Researcher	*[Agrees].*
9	Student 1	*If there wasn't a hero...The villain wouldn't be stopped.*
10	Student 2	*...If there wasn't a hero then the villain would just succeed easily.*
11	Student 2	*And if there wasn't marriage and falling in love, like we said, like a lot of things would be different and a lot of people wouldn't do things.*
12	Student 1	*And like if it wasn't there again, some people might not, they might not have been that brave to do it because they've got nothing to live for.*
13	Researcher	*[Agrees].*
14	Student 2	*Because a lot of people do things because, like, they're in love with someone but they wouldn't do it otherwise.*

This extract demonstrates GRE within several of the turns (5, 7, 9, 11, 12, 14). The justification and reasoning upon which task decisions are based clearly make use of student understanding of genre and generic conventions. Turn 5 for instance identifies three given genre features as being significant to plot development within the fairy tale genre. Turns 7, 9, 11 and 12 consider hypothetically the consequences of omitting particular features from fairy tales. Implicit within these arguments lies an

understanding of core components within the fairy tale genre. For example, turn 9 implicitly recognises the significance of preventing the villain's success. Not only are heroes and villains considered in terms of their importance within fairy tales, but the way in which these features are dependent on one another and the requirement for some sort of resolution to a threat are all hinted at in the discussion above.

5.1.1.2   Odd one out
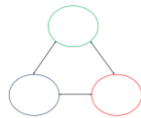
One lesson in School B (Y6) used the 'odd one out' triangle structure to promote GRE. This lesson coded 30% of turns as GRE when secondary codes are included in analysis (Table 5.6), and 40% when potentially cross-cutting codes were eliminated from consideration (Table 5.7). A further 10% or 13% of turns were coded using the general RE code. Proportions of domain-specific reasoning (GRE) were larger than those for any other code. Again, only a small minority of turns were uncoded (1%) demonstrating the focused discussion maintained throughout the activity. Patterns are similar to those observed in the diamond ranking tasks in the sense that elaboration codes were also used frequently. As mentioned above, this provides evidence of the overall dialogic nature of discussion with students extending upon points made. Crucially though, the large proportions of GRE observed provide strong evidence for the potential to promote and capture discipline-specific reasoning in student dialogue.

Table 5.6 Odd one out GRE School B

Table 5.7 Odd one out GRE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	9	7%
EL	21	17%
REI	8	6%
RE	12	10%
GRE	37	30%
LRE	0	0%
ARE	0	0%
CI	0	0%
SC	5	4%
RC	0	0%
A	25	20%
Q	5	4%
RB	1	1%
RW	0	0%
OI	0	0%
UNCODED	1	1%

Code	Frequency of instances	% instances
ELI	9	10%
EL	21	23%
REI	8	9%
RE	12	13%
GRE	37	40%
LRE	0	0%
ARE	0	0%
CI	0	0%
SC	5	5%
RC	0	0%
A		
Q		
RB		
RW		
OI	0	0%
UNCODED	1	1%

Quantitative data for the odd one out task is also supplemented with transcript data. The extract below (Table 5.8) is from the odd one out activity to promote GRE in School B. Students were given a triangle odd one out template containing three texts from the Robinsonade (or desert island story) genre. Students were asked to use their knowledge of the genre and its features when deciding which of the texts can be considered 'odd'. These texts were distinguished from one another as part of the task (individual differences for each text were recorded beside their name at one of the points in the triangle). Similarities between any two of the texts were recorded on connecting lines. Finally, overall similarities were usually recorded in the middle of the triangle.

Table 5.8 Extract from odd one out lesson to promote GRE School B

Turn	Speaker	
1	Student 1	*Looking at this now, I would say that 'Swiss Family Robinson' is probably the odd one out, because it's very different between 'Kensuke's Kingdom' and 'Robinson Crusoe'. Like, you don't hear about why they're going on the ship and everything. They're shipwrecked together and they don't leave the island, whereas only Robinson and, well, Kensuke was shipwrecked at a completely different time.*
2	Student 2	*I think 'Robinson Crusoe' is the odd one out, because 'Swiss Family Robinson' and 'Kensuke's Kingdom', they all leave at least one person on the island but Crusoe leaves with Friday and his father.*
		…
3	Researcher	*Okay, so you've made arguments for why at least two of them could be the odd one out, why do you think they might all be given this title? Why might they all still belong to the Robinsonade genre?*
4	Student 1	*Because they all still end up on a desert island and they've got to try and survive and find ways to-*
5	Student 2	*It all involves boats and the ocean, and another person being on the island.*
6	Student 1	*Yes, there is someone else and they will help you to survive and usually they become friends.*
		…
7	Student 2	*Because they've all got, sort of the same things that happen, someone gets saved-*
8	Student 1	*Yes, they all end up on an island and there's someone else there though, like, they've got to rescue someone else and they've all got to try and survive.*

The extract above demonstrates examples of GRE when students were engaging with *odd one out* (turns 1, 2, 4, 5, 7 and 8). Student understanding of the Robinsonade genre is made clear through their identification of several features important to the genre (such as being shipwrecked, landing on a desert island, the importance of a 'help' figure and eventual rescue). Using the triangle odd one out format, students were able to distinguish between aspects of particular texts from within the genre (e.g. turns 1 and 2) as well as to recognise overarching similarities (e.g. turns 4, 5, 7 and 8). Within this discussion lies implicit recognition of both the individuality of texts as well as patterns of similarity across them all. Justifications and reasoning behind decisions to allocate texts as 'odd' were often made with reference to and on the basis of knowledge about the genre (e.g. turn 7

recognises "the same things that happen", such as being saved). Again, transcript data helps to illuminate what GRE looks like in data gathered here. Transcripts act as magnifying lenses through which to delve further into a particular code. Qualitative data therefore supplements the quantitative data of code proportions and patterns.

5.1.1.3   Fortune lines
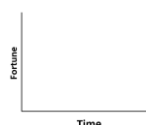
One lesson used the fortune lines task structure to promote GRE (Y5). Data obtained in this activity demonstrates a different pattern of code proportions to those found when using the other three task structures (role on the wall is considered in the next section). In the fortune lines lesson to promote GRE, 5% (Table 5.9, all codes included) or 6% (Table 5.10, potentially cross-cutting codes removed) of turns were allocated the GRE code. 16% or 19% were allocated the general reasoning code (RE). The lesson did demonstrate a large proportion of reasoning, but this tended to be more general than domain-specific. The activity can also be described as dialogic in terms of its large proportions of elaboration (26% or 31%) and its associated invitational code (17% or 21%). The proportion of uncoded turns was also fairly low (6% or 8%) and was mainly used for unfinished utterances rather than off-topic conversation or behaviour. This data therefore suggests that students were building upon ideas, were requesting elaboration from each other and were reasoning about decisions made. However, the reasoning tended to be more general in nature rather than based on knowledge about genre.

Table 5.9 Fortune lines GRE School A

Table 5.10 Fortune lines GRE School A (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	46	17%
EL	73	26%
REI	19	7%
RE	45	16%
GRE	10	5%
LRE	0	0%
ARE	1	5%
CI	0	0%
SC	0	0%
RC	0	0%
A	38	14%
Q	4	1%
RB	0	0%
RW	0	0%
OI	5	2%
UNCODED	18	6%

Code	Frequency of instances	% instances
ELI	49	21%
EL	73	31%
REI	20	8%
RE	46	19%
GRE	15	6%
LRE	0	0%
ARE	13	5%
CI	0	0%
SC	0	0%
RC	0	0%
A		
Q		
RB		
RW		
OI	5	2%
UNCODED	18	8%

Several reasons for the difference in reasoning patterns observed here can be offered. The fortune lines task required students to plot the fortunes of two characters (the Enchantress and Erik) from Terry Jones' *Erik the Viking*. Students were provided with bullet points of six to eight main events from one chapter. They had to decide where to plot each character's fortune at each of these points. It was hoped that after plotting these fortunes, students would be able to observe the reversal of fortunes typical of certain genres (such as fairy tales and sagas). This reversal sees the low fortune of the virtuous or 'good' character (usually instigated by some type of villain) reversed to achieve a happy ending. The converse is true of the villain (their fortune is lowered at the end where they often receive some form of punishment). Fortunes of individual character-types are therefore reversed, as well as fortunes of each relative to the other (the point of reversal typically happens at the same point in time so that a crossover can be seen on the graph).

Despite the learning opportunities of plotting and observing this crossover of fortune, demands to plot fortunes for each character took the majority of time spent on the activity. Students were engaged in the task and demonstrated dialogic ways of working together yet reasoning based on

genre was not really demanded or foregrounded by the task requirements. Indeed, it was not until turn 226 (of 275) that I (as researcher) was even able to draw students' attention to the crossover. Even then, further prompts were required to focus discussion on genre. GRE that was demonstrated was largely facilitated by prompts from me and was limited to the end portion of dialogue. The fortune lines activity to promote GRE was therefore flawed in that it did not demand students to engage with genre and generic conventions from the beginning of the task or for the majority of discussion time. Moreover, when students did focus on genre, this tended to be instigated by me or the class teacher working with groups. The activity did not explicitly demand engagement with genre.

It is not possible to know without further development and investigation whether the fortune lines activity could be a useful task structure to promote GRE. However, it is possible to reflect hypothetically on potential changes to this activity which might facilitate a higher proportion of GRE. To improve this activity, the task would have to be presented in a different way. For example, students could be given completed fortune lines for several pairs of characters from a given genre (these could be supplied one graph at a time to move from considering particular examples to explore general, or 'generic', patterns). For instance, graphs for Red Riding Hood and the wolf; the three pigs and the wolf; and Cinderella and her wicked stepmother could demonstrate typical fortunes of 'good' and 'bad' characters from the fairy tale genre exemplifying ways in which these fortunes change and 'reverse'. An unusual example could also be provided (such as the Gingerbread Man and the wolf where the 'good' gingerbread man is eaten in the end leaving the 'bad' wolf victorious). These graphs may have been completed by groups or the class in previous lessons or might be provided by the class teacher. It would be important that students were themselves familiar with the creation of fortune lines so that they were able to infer what the graph showed. Students could be given discussion questions to focus their attention on the genre and genre features. For example, what do you notice about the ways in which fortunes change in fairy tales? Do fortunes improve or get worse? For whom/for which 'type' of character? Students should be requested to consider specific examples from the genre to support or refute arguments or points that they make. They might then be asked to decide upon some generic conventions or 'rules' for the fairy tale genre based on their discussions.

The fortune lines activity recorded in this project did not demonstrate high proportions of GRE. Yet, ideas discussed above, while speculative, illustrate the importance of exploring the potential of this task structure to the promotion of GRE in future research.
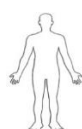
5.1.1.4 Role on the wall

One lesson (Y6) used role on the wall to promote GRE. Findings from this task also provide strong evidence that domain-specific reasoning in English can be promoted, operationalised and captured. 21% of turns were coded as GRE when all codes are included in consideration (Table 5.11). This rises to 28% when the four potentially over-lapping codes are removed from analysis (Table 5.12). As might be expected given patterns of proportions across the other three activities used to promote GRE, elaboration was the other code sharing the largest proportion of student dialogue (23% or 32%). The proportion of uncoded turns was negligible (1%) demonstrating the focused and dialogic nature of group discussion. 7% or 9% of turns were coded using the more general reasoning code (RE). The much larger proportion of turns allocated the domain-specific code provides further evidence for the possibility of realising, promoting and capturing GRE within student dialogue.

Table 5.11 Role on the wall GRE School B

Table 5.12 Role on the wall GRE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	16	10%
EL	37	23%
REI	13	8%
RE	11	7%
GRE	33	21%
LRE	0	0%
ARE	1	1%
CI	0	0%
SC	4	3%
RC	0	0%
A	41	26%
Q	1	1%
RB	0	0%
RW	0	0%
OI	0	0%
UNCODED	1	1%

Code	Frequency of instances	% instances
ELI	16	14%
EL	37	32%
REI	13	11%
RE	11	9%
GRE	33	28%
LRE	0	0%
ARE	1	1%
CI	0	0%
SC	4	3%
RC	0	0%
A		
Q		
RB		
RW		
OI	0	0%
UNCODED	1	1%

Transcript data for this activity (Table 5.13) exemplifies GRE observed above. In this activity, students were asked to annotate a blank role on the wall outline considering the typical protagonist of a Robinsonade or 'desert island' story. For the inside portion of the outline, students noted typical personality features and characteristics of main characters in these texts. An example might be 'fearlessness'. Around the outside of the outline, students identified typical events or situations that these characters are faced with (such as being shipwrecked). The teacher asked that these choices were justified verbally within groups.

Turn No.	Speaker	
1	Student 1	*They would feel quite lonely but when other people come, like, giving-like a boost to your confidence.*
2	Researcher	*Yes, so they can be lonely at times. Have you got evidence? Can we think of examples of when that happens?*
3	Student 1	*When Michael first went on the island, he was really sad and crying because his parents had gone, and he thought he wasn't going to see them ever again.*
4	Student 2	*In Robinson Crusoe he thought he was all by himself until he saw the footprint in the sand.*
5	Student 3	*Yes, and then when he saw the footprint, he was not lonely, but he was worried because he didn't know who it was or what it was.*
		…
6	Student 1	*Talking on the outside [of the role on the wall figure], there is always danger there, in Kensuke's Kingdom, in all of them there is obviously- to survive-*
7	Student 2	*Like the killer men come.*
8	Student 1	*The killer men come and the cannibals in Crusoe.*
9	Student 3	*Crusoe. Shall we put on the outside, people who come-*
10	Student 1	*Danger.*
11	Student 2	*Killer men, killer people.*
		…
12	Student 3	*They've got their own unique way of surviving.*
13	Student 2	*What do you mean?*
14	Student 3	*Because Swiss Family Robinson made-*
15	Student 2	*A farm.*
16	Student 1	*Also, they made a tree-*
17	Student 2	*Treehouse, Kensuke made sort of a cave and Crusoe just made-*
18	Student 1	*A mini hut.*
19	Student 2	*Yes.*
		…

20	Student 1	*The people are usually quite determined and usually quite friendly, because they, in Kensuke's Kingdom, Kensuke and Michael are helping each other to survive. In Robinson Crusoe, Robinson helps Friday and they save some more people and in Swiss Family Robinson they work together to help each other to survive.*
		…
21	Student 3	*Fearless.*
22	Student 1	*Yes, because you would think they would be quite scared of it, but they're not actually as scared as maybe if you put someone else in their situations.*
23	Researcher	*Okay. Give me an example?*
24	Student 1	*In Robinson Crusoe, when they're faced with the cannibals and everything, they don't really panic and get really upset about everything. They [main characters in Robinsonades] sort things out and just do what has to be done.*
25	Student 3	*Also, when Michael went into the forest, he heard the gibbons, but he just told himself that they were just gibbons and another animal making a noise.*

The extract above demonstrates GRE within several turns. For example, turn 1 demonstrates an understanding of generic patterns within the Robinsonade genre by recognising the feelings of solitude faced by those stranded on an island but also demonstrating an understanding that such feelings are typically alleviated by the arrival of, or encounter with, another person. The same student expands upon this idea in turn 20 by providing specific examples of the ways in which characters have been supported and offer their own support to another figure(s). In addition, turn 6 identifies a common feature of the genre and the specific texts studied in terms of dangers posed to the protagonist's survival. This is expanded upon later in turn 12 when another student comments on the individuality of texts and characters while still recognising their over-arching similarity in terms of achieving survival. Turn 24 provides a further example from one text of the ways in which characters overcome threats to their survival. The unique characteristics (fearlessness, resilience, bravery) of the protagonists typical to the Robinsonade genre are implied in turn 22 when the student hints at the distinctive resilience of these characters in comparison to others. Considering extracts from transcript data can therefore help to add depth and richness to quantitative proportions reported. These extracts can exemplify how domain-specific reasoning might manifest in student dialogue.

Figure 5.1 summarises evidence discussed above. Proportions are taken from those reported with the four overlapping codes removed. This prevents a skewed representation which might arise when instances of the four cross-cutting codes were high. All four task structures were able to promote dialogue which could be coded as GRE. Three of the task structures were able to promote a large proportion of domain-specific reasoning, equal to, or in excess of, 28% of all dialogue (including any turns attributed the 'uncoded' code). The fortune lines activity did not observe the same extent of domain-specific reasoning for the GRE task. Possible reasons for this are reflected upon above but mainly centre on poor task design and delivery and the need to foreground a focus on genre. As fortune lines GRE data is based on one lesson, this task structure cannot be discounted as potentially valuable to the scaffolding of GRE. Rather, future efforts to use this task structure must carefully consider ways in which genre can be engaged with and held at the forefront of discussion (and therefore task requirements).
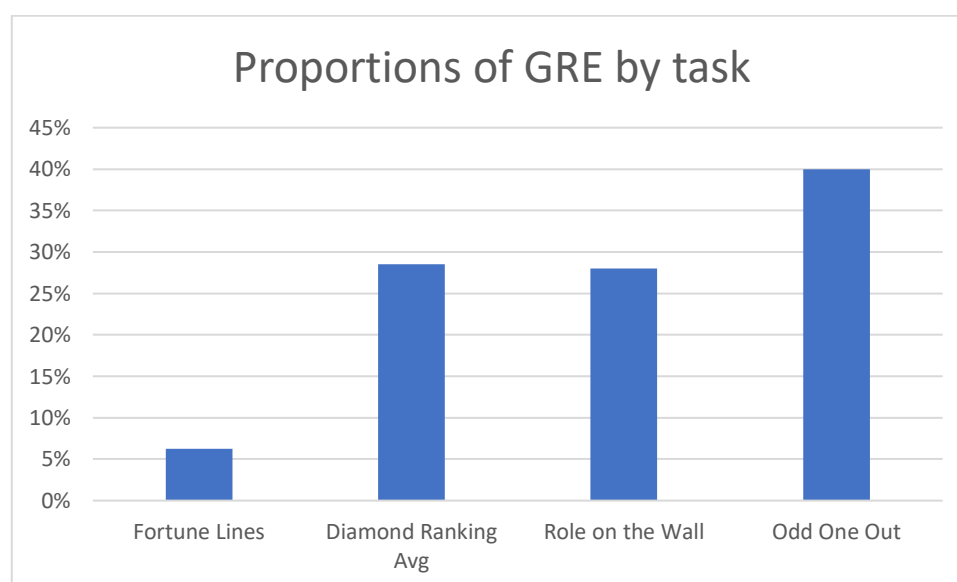
Figure 5.1 Proportions of GRE by task

Section 5.1 has presented proportions of GRE (and other dialogue move codes) observed using four task types. For three of the task structures, extracts from transcript data supplement numerical data (since proportions of GRE were low for the fortune lines activity, extracts exemplifying student

engagement with GRE were not included). The same format will be used to present findings for tasks promoting analogy-based reasoning (ARE).

5.1.2   Analogy-based reasoning (ARE)

Three task structures were used to promote analogy-based reasoning (ARE): odd one out, fortune lines and role on the wall. These lessons occurred across two schools and between three different classes and year groups (years 4, 5 and 6). Evidence from ARE tasks largely support the argument that styles of reasoning for primary English are distinct and operationalisable. There are some nuances within these findings which will be discussed. For example, findings from the role on the wall task depart from the promising proportions of domain-specific reasoning observed across the other two tasks. While the diamond ranking format was initially deemed least applicable to the promotion of ARE (in comparison to the other three task structures) and was not therefore subject to formal exploration here, future efforts might explore the potential of this task structure to promote ARE.

5.1.2.1   Odd one out

One lesson (Y6) used the odd one out task structure to promote ARE. In line with most findings from the GRE tasks, findings from the odd one out ARE task provide strong evidence that domain-specific reasoning in English can be promoted, operationalised and captured. 20% of turns were coded as ARE when all codes are included in consideration (Table 5.14). This rises to 31% when the four potentially over-lapping codes are removed from analysis (Table 5.15). Similar to most GRE findings, the elaboration code shared a substantial proportion of all coded turns (17% or 28%). The proportion of uncoded turns was very low (4% or 6%) demonstrating the focused and dialogic nature of group discussion. 4% or 7% of turns were coded using the more general reasoning code (RE). The large proportion of turns allocated the domain-specific code provides evidence for the potential to

realise domain-specific reasoning (ARE in particular) in the classroom and capture it in student dialogue.

Table 5.14 Odd one out ARE School B

Code	Frequency of instances	% instances
ELI	26	9%
EL	50	17%
REI	13	5%
RE	12	4%
GRE	0	0%
LRE	0	0%
ARE	56	20%
CI	7	2%
SC	2	1%
RC	0	0%
A	96	34%
Q	10	3%
RB	2	1%
RW	0	0%
OI	1	0%
UNCODED	11	4%

Table 5.15 Odd one out ARE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	26	15%
EL	50	28%
REI	13	7%
RE	12	7%
GRE	0	0%
LRE	0	0%
ARE	56	31%
CI	7	4%
SC	2	1%
RC	0	0%
A		
Q		
RB		
RW		
OI	1	1%
UNCODED	11	6%

Exemplifying quantitative proportions of ARE with qualitative transcript data (Table 5.16) illustrates how ARE was demonstrated in student dialogue. The extract below is taken from an activity which required students to identify the *odd one out* of three characters in Michael Morpurgo's *Kensuke's Kingdom*. The three characters were presented in the triangle odd one out format. This supported students to draw links between any two characters since lines connecting characters were used to record shared similarities. The individual bubbles containing the separate character names were annotated with distinguishing features of those characters which could render them 'odd'. Thus, students were encouraged to identify a feature making a character 'odd' as well as a corresponding similarity shared between the other two characters.

Table 5.16 Extract from odd one out lesson to promote ARE School B

Turn No.	Speaker	
1	Student 3	*Michael's mother [is the odd one out] because Michael and Kensuke are the main characters in the story, because the book is called Kensuke's Kingdom and Michael is the one reading the story or something. They're both the main characters.*
2	Student 1	*I would choose Michael's mother, too, because Michael and Kensuke both have the same thing. They're both stranded. Like family or relatives have died, so they both have a similar story.*
3	Researcher	*A similar experience. What about you, [student 2]?*
4	Student 2	*I think Michael is the odd one out because both Kensuke and Michael's mother looked after Michael and helped him to get where he is now.*
		…
5	Student 1	*They're (Michael and Kensuke) related because they've got a similar story so they're related, and they're (Michael and his mother) related because they're family. Then they're (Kensuke and Michael's mother) related because they're adults.*

The extract above demonstrates ARE within several turns. Turn 1 draws comparisons between the three characters considered in the triangle odd one out structure. The speaker identifies one character as being 'odd' on the basis of their lack of presence and/or importance within the story as a whole. The speaker identifies the 'odd' figure by considering the similarity joining the two other figures within the triangle (Kensuke and Michael). Reasoning for the task decision to select an 'odd' character is therefore based upon explicit comparison between characters. Turns 2 and 4 similarly identify a shared similarity between two characters, distinguishing them from the third, or 'odd' character. Turn 5 synthesises arguments expressed for selecting characters as 'odd'. This student identifies reasons for each of the three characters being classified as 'odd one out'. While these turns make the similarities or shared features between two characters explicit, implicit within this discussion are factors rendering the third 'odd' character distinct.
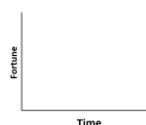
One lesson (Y5) used the fortune lines task structure to promote ARE. Although with lower proportions than those observed in the odd one out activity, findings from the fortune lines task also provide evidence that ARE in English can be promoted. 12% of turns were coded as ARE when all codes are included in consideration (Table 5.17), or 15% when the four potentially over-lapping codes are removed from analysis (Table 5.18). Elaboration is the most dominant code (18% or 22%). The proportion of uncoded turns was again low (6% or 7%) demonstrating the focused and dialogic nature of group discussion. 10% or 12% of turns were coded using the more general reasoning code (RE). In conjunction with proportions of ARE, the overall proportion of reasoning demonstrated during this activity was high. While the proportion of domain-specific reasoning is not much higher than the proportion of general reasoning, there is still some evidence of the capacity to promote and capture ARE.

Table 5.17 Fortune lines ARE School B

Code	Frequency of instances	% instances
ELI	40	14%
EL	50	18%
REI	35	13%
RE	28	10%
GRE	0	0%
LRE	0	0%
ARE	34	12%
CI	3	1%
SC	8	3%
RC	3	1%
A	42	15%
Q	9	3%
RB	1	0%
RW	0	0%
OI	8	3%
UNCODED	16	6%

Table 5.18 Fortune lines ARE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	40	18%
EL	50	22%
REI	35	16%
RE	28	12%
GRE	0	0%
LRE	0	0%
ARE	34	15%
CI	3	1%
SC	8	4%
RC	3	1%
A		
Q		
RB		
RW		
OI	8	4%
UNCODED	16	7%

The transcript extract below (Table 5.19) is taken from an activity which required students to use the fortune lines structure to plot the relative fortunes of two characters from Michael Morpurgo's *Kensuke's Kingdom* (Michael and Kensuke). They were provided with brief notes referring to eight key plot points (e.g. 'Michael lands on the island'). This was to ensure that students did not spend too much time recalling and relating events to their group. Instead, it was hoped that students were able to focus on the purpose of the activity: making explicit comparisons between the fortunes of two characters. Given the problems encountered with the role on the wall activity to promote ARE (discussed later in Section 5.1.2), students were requested to take one plot event at a time and to plot the fortunes of both characters. This prompted comparison from students throughout the task. The use of role on the wall for ARE was flawed in the sense that students were able to complete the figure outline for characters one at a time. While comparisons between inward and outward features for that individual character were still possible, opportunities to make explicit comparisons *between* characters were limited. Thus, careful consideration was given to the ways in which task structures were used to support the promotion of ARE throughout a task. These reflections helped to improve future activities.

Table 5.19 Extract from fortune lines lesson to promote ARE School B

| Turn No.	Speaker	
1	Student 2	*I think, though, Kensuke, he's probably, he's, like, a bit higher [than Michael] because he's got clean water. They might have clean water, but, like, and he's got land, so he can do whatever he wants and stuff.*
2	Student 3	*I would say he's a bit lower because he might have food and water and an island to live on, but he doesn't have, like, friends or family. His family are the orangutans, so I would put him a bit lower.*
3	Student 1	*I would just say a tiny bit lower than Michael, because he's happy on the island by himself, like, and he has all these orangutans who he likes to spend time with, but he would be a bit sad as well because he doesn't have anyone else on that island to talk to. He thinks his wife has, like, died.*
		…
4	Student 2	*For Kensuke, I would put him a bit lower [than Michael].*
5	Researcher	*You think Kensuke is a bit less fortunate than Michael?*
6	Student 2	*A tiny bit because he didn't want anyone on the island, because he just wants to be left alone. When Michael came on the island, he's, like, upset and stuff.*

7	Student 3	*Because he doesn't, like- it says he doesn't like humans anymore, and he thinks that all of them, all the humans who he sees are killer men, and he just wants to be alone on the island with the orangutans.*
8	Student 1	*I want to put him that low down, I would say. Maybe he's about halfway or just under halfway, because he has his orangutans and he can just stay out of Michael's way, but he's still really unhappy that Michael's on that island.*
9	Researcher	*Okay, so would you say, at point two, you've already plotted Michael's point for point two, would you say that Kensuke is below, at the same point or higher than Michael?*
10	Student 1	*A tiny bit higher.*
11	Researcher	*Right, that's interesting. Explain why.*
12	Student 1	*Because at least he knows, he has, like, the food and water and Michael doesn't. He can still stay alive and just stay out of Michael's way, although he's unhappy about Michael being on the island.*
13	Student 3	*I would put it a bit lower because, like, he doesn't have any family. Well, he does, but he thinks they've died, and his family is basically orangutans, so I would put him a bit lower.*
		…
14	Student 1	*I would put Michael about in the middle because he has a plan that he's going to relight the fire when Kensuke is not watching, but he's still quite angry and upset that Kensuke has put the fire out, because he wants to try and get his family to see it so they'll come. I would put Kensuke maybe, like, a quarter off or so, because he's really angry that Michael lit that fire and he doesn't want him to do it again. He can still, kind of, watch Michael and make sure he doesn't do it again.*
		…
15	Student 1	*I'm keeping mine where it is because Kensuke thinks he's lost his family. He doesn't know if it's alive, but he's pretty sure that they're dead. He might think he doesn't deserve to be alive, like, he should've got killed so he could be with his family. Instead, he's not, and he's still grieving for them because he couldn't even do a little funeral or anything, and he couldn't see them before he actually died since he was out on the boat. So, he's still grieving for them. Then, Michael, at the same time, he has lost his family, but at least he knows they're alive and they could come back for him.*

ARE is demonstrated in many of the turns above. In turns 1 and 2, two students each argue for a

different task-based decision: Student 2 believes that Kensuke's fortune is higher than Michael's,

Student 3 believes that Michael is the more fortunate. Students then make their reasoning for these

decisions clear. Each student identifies something which makes the characters distinct from the other. Student 2 (turn 1) argues that Kensuke is more fortunate than Michael (at a particular point in the story) given his access to clean water and land. Student 3 (turn 2) disagrees and instead argues that Michael is more fortunate given his supportive family network. Each of these turns thus explicitly identifies differences between two characters. These differences are used to justify the students' task decisions in terms of where to plot the fortunes for each character relative to the other.

Turn 8 is interesting in that it builds upon analogies drawn between characters (the fortunes of Michael and Kensuke) but also implicitly compares the fortunes of an individual character over time. The student justifies the decision to plot Kensuke's fortune at the halfway point by identifying reasons that the character is fortunate but also reasons that might reduce his fortune. Thus, the curve of Kensuke's fortune has seen a drop at the point in which Michael enters the island. The factors supporting an enhanced fortune for Kensuke are still there (the orangutans), yet other factors have led to a reduction in fortune.

Many other turns in this extract also demonstrate ARE. Students frequently identify explicit reasons for their decisions to either reduce or increase the plotted fortunes of characters. On many occasions, this justification involves identifying effects of an event or point in time upon each of the characters (e.g. turn 14). The high proportions of ARE can therefore be illustrated using this extract.
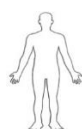
5.1.2.3   Role on the wall

One lesson (Y5) used the role on the wall task structure to promote ARE. Data obtained in this activity demonstrates a different pattern of coded dialogue moves to patterns found using the other two activities to promote ARE. In the role on the wall lesson, 4% (Table 5.20, all codes included) or 5% (Table 5.21, potentially cross-cutting codes removed) of turns were allocated the ARE code. 18% or 22% were allocated the general reasoning code (RE). The lesson did therefore demonstrate a high

proportion of reasoning, but this tended to be more general than domain-specific. The activity can also be described as dialogic in terms of its high proportions of elaboration (27% or 33%) and its associated invitational code (22% or 28%). The proportion of uncoded turns was also minimal (1%). This data therefore suggests that students were building upon one another's ideas, were requesting elaboration from each other and were reasoning about decisions made. However, the reasoning tended to be more general in nature rather than based on explicit analogues.

Table 5.20 Role on the wall ARE School A

Code	Frequency of instances	% Instances
ELI	44	22%
EL	53	27%
REI	6	3%
RE	35	18%
GRE	0	0%
LRE	0	0%
ARE	8	4%
CI	0	0%
SC	0	0%
RC	0	0%
A	35	18%
Q	0	0%
RB	5	3%
RW	0	0%
OI	13	7%
UNCODED	1	1%

Table 5.21 Role on the wall ARE School A (overlapping codes removed)

Code	Frequency of instances	% Instances
ELI	44	28%
EL	53	33%
REI	6	4%
RE	35	22%
GRE	0	0%
LRE	0	0%
ARE	8	5%
CI	0	0%
SC	0	0%
RC	0	0%
A		
Q		
RB		
RW		
OI	13	8%
UNCODED	1	1%

Several possible reasons for differences in reasoning patterns across the tasks used to promote ARE can be offered. A main problem seems to be the way in which the role on the wall task was used in this instance. Students were asked to consider which of three recently studied characters was most heroic: Terry Jones' *Erik the Viking*, Theseus from the Greek myth *Theseus and the Minotaur*, or Chandra from Arvan Kumar's *The Heartstone Odyssey.* For this activity, students were advised to consider only the inward characteristics of the three characters. Characters were therefore compared in terms of their characteristics and personality traits which might support or refute their status as heroes. Students were provided with a bank of potential characteristics to consider (such

as courage, loyalty, determination) although they were also encouraged to develop their own ideas. Students decided which character to apply each trait to and were also encouraged to consider whether any other characters shared this trait.

While the structure of role on the wall requires comparison between the inward and outward features of a character, this particular activity removed the inbuilt comparison by focusing only on inward features. Despite removing some opportunities for comparison, this was probably necessary in this instance given the demands of completing the inside portions for three characters rather than just one. One possible reason for the lower levels of ARE in this task is that students tended to take one character at a time and complete the inward section of the role on the wall diagram before moving on to the next character. This meant that during the time spent considering a single character, very little comparison was required. To improve proportions of ARE, students could have been advised to consider one trait at a time and to discuss which of the three characters this most applied to. This may have prompted students to reflect upon questions such as which of the three characters was most loyal and why they think this. By completing the three figures simultaneously, rather than sequentially, students would have had more opportunity to make comparisons throughout their discussions thus potentially increasing proportions of ARE. In addition, more time could have been spent considering the overarching question of the task: which character is most heroic? When students did address this question, the completed role on the wall figures were referred to alongside evidence underpinning decisions to attribute particular traits to certain characters yet there could have been further development of the overall response to this broad question.

Thus, while evidence from the role on the wall task to promote ARE seems limited, this task structure should not be eliminated as potentially supportive of ARE. Rather, careful consideration should be given to ways in which students are asked to engage with the format to ensure that explicit analogy is foregrounded and required throughout.

Figure 5.2 summarises evidence presented above. Proportions are taken when the four overlapping codes are removed. This prevents a skewed representation which might arise when instances of the cross-cutting codes were high. All three task structures were able to promote dialogue which demonstrated ARE. Two of the task structures were able to promote a larger proportion of domain-specific reasoning: 15% or more of all dialogue (including any turns attributed the 'uncoded' code). The role on the wall activity did not promote the same level of proportions of ARE. Possible reasons for this are discussed above but mainly centre on poor task design and delivery. As data is based on one lesson to promote ARE, this task structure should not be discounted before its utility to the promotion of ARE is explored further. Future efforts to use this task structure must carefully consider ways in which students can be encouraged to draw analogies (such as making comparisons throughout the activity rather than after completing each role on the wall figure individually).
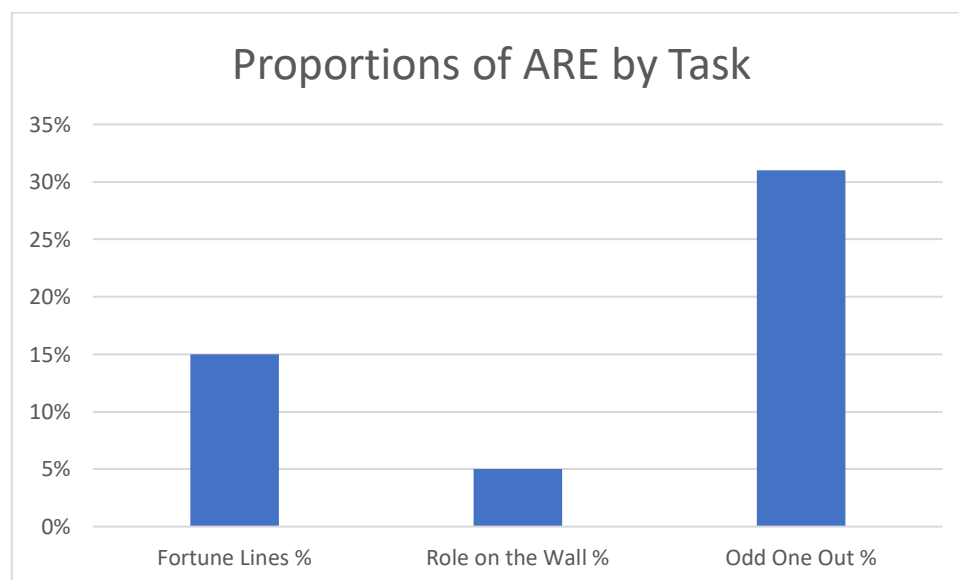
Figure 5.2 Proportions of ARE by Task

5.1.3   Language-based reasoning (LRE)

Three task structures were used to promote language-based reasoning (LRE): diamond ranking, odd one out and role on the wall. These lessons occurred across two schools and between three different classes and year groups (years 4, 5 and 6). Evidence from LRE tasks largely support the argument that the styles of reasoning identified as important in primary English are distinct, operationalisable and possible to capture in student dialogue. There are some nuances within these findings which will be discussed. While the fortune lines format was initially deemed least applicable to the promotion of LRE (in comparison to other task structures), future efforts might explore the potential that this task structure holds to promote LRE.
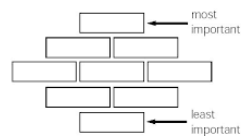
5.1.3.1   Diamond ranking

One lesson (Y6) used the diamond ranking task structure to promote LRE. In line with most findings from GRE and ARE tasks, findings from this LRE task provide strong evidence that domain-specific reasoning in English can be promoted, operationalised and captured. 22% of turns were coded as LRE when all codes are included in consideration (Table 5.23). This rises to 31% when the four potentially over-lapping codes are removed from analysis (Table 5.24). Again, elaboration shared a fairly high proportion of coded turns (14% or 19%). The proportion of uncoded turns was very low (2% or 3%) demonstrating the focused and dialogic nature of group discussion. 9% or 13% of turns were coded using the general reasoning code (RE). The much greater proportion of turns allocated the domain-specific code provides further evidence for the ability to promote LRE and to capture it in student dialogue.

Table 5.22 Diamond ranking LRE School B

Code	Frequency of instances	% instances
ELI	11	5%
EL	28	14%
REI	23	11%
RE	19	9%
GRE	0	0%
LRE	46	22%
ARE	0	0%
CI	2	1%
SC	2	1%
RC	1	0%
A	48	23%
Q	9	4%
RB	0	0%
RW	0	0%
OI	12	6%
UNCODED	4	2%

Table 5.23 Diamond ranking LRE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	11	7%
EL	28	19%
REI	23	16%
RE	19	13%
GRE	0	0%
LRE	46	31%
ARE	0	0%
CI	2	1%
SC	2	1%
RC	1	1%
A		
Q		
RB		
RW		
OI	12	8%
UNCODED	4	3%

Transcript data (Table 5.25) illuminates proportions presented above. The activity below required students to rank emotions or feelings experienced by Michael, the protagonist in *Kensuke's Kingdom*. They were asked to decide which of these feelings were most dominant and rank accordingly.

Table 5.24 Extract from diamond ranking lesson to promote LRE School B

Turn No.	Speaker	
1	Student 1	*Yes, the most important, I would say, is 'unsure'. He was mostly unsure, like, how did he get on the island and how will he get off the island.*
2	Student 3	*Yes.*
3	Student 2	*Yes, I think 'unsure', not 'confused' though.*
4	Student 1	*Confused means, like, you don't know what's going on.*

5	Student 2	*Well, the same thing, but you could be confused about what was going on, but you still know what was going on.*
6	Student 1	*Yes, but if you're unsure you don't know what's going to happen.*
		…
7	Student 2	*But, I don't know if he's unsure because he did know that he fell off the boat and he did know what happened.*
8	Student 1	*Yes, but he didn't know how he got on the island and he didn't know have any clue how he was going to get off.*
		…
9	Researcher	*Okay. So, tell me about why you think 'unsure' was the overriding emotion that Michael felt?*
10	Student 1	*Because he didn't have any clue how he got on the island or how he's going to get off, or if he saw a ship how he was going to get the ship to come.*
11	Student 2	*Or make a fire, he couldn't make a fire, and he was unsure through the full story.*
12	Student 1	*Yes, and then he was unsure if he was going to survive because he had no food or water. Then, the only water he had was the sea, he was tempted to drink it, and if he did he would've died because the sea's too salty for him to drink. So, I think the list is alright.*
13	Researcher	*Okay. So, then tell me about and justify why you think 'in good spirits' was the least important of those emotions?*
14	Student 2	*Because he doesn't feel it that much. He feels it at the start where he's, like, in good spirits because he's calling for his parents and his parents might be there, but then that soon just fades away because they're not there.*
15	Student 1	*'In good spirits' is kind of like hope, he had a bit of hope at the start.*
		…
16	Student 1	*When he "struggled to his feet" he was obviously exhausted, but then he just forgot about it because he was determined to get off the island.*
		…
17	Student 1	*He was a bit 'unsure' and 'confused' as well, when he thinks, "I stood there for some time trying to work out how I got here, how it was that I'd survived. I had such confused memories of being picked up, of being onboard the Peggy Sue." He's confused and unsure there. We could move it about a bit, like, I think he was more 'frightened' than he was 'apprehensive'. But, that's what I think, like, he would definitely be more frightened than he was worrying.*

Several turns exemplify LRE. Students discuss and reflect upon the meanings of 'unsure' and 'confused' considering differences between the two adjectives (turns 4, 5 and 6). This is supported with reference to several instances in which Michael, the protagonist of Kensuke's Kingdom, experiences these emotions (turn 1, 7, 8, 10, 11, 12 and 17). Direct quotations are taken from the text to support this discussion (turn 17). This demonstrates students' ability to recognise instances of experienced emotions as well as being able to relate their meanings. Such discussion is used to support group discussion about where to place 'confused' and 'unsure' within the diamond ranking grid. Students also discuss the phrase 'in good spirits' which the group decide to place at the bottom of the grid. Reasons for this are explained in turn 14; the meaning of the phrase is articulated in turn 15. Students then consider the term 'exhausted', finding evidence from the text to support discussion (turn 16). Differences between the terms 'frightened' and 'apprehensive' are also implied in turn 17. Decisions about where to place the terms within the diamond ranking grid are therefore justified through explicit consideration of language and with close reference to the text. LRE is therefore promoted and provoked within this task.

5.1.3.2   Odd one out

One lesson (Y5) used the odd one out task structure to promote LRE. Findings from this task also provide evidence that domain-specific reasoning in English can be promoted, operationalised and captured. 15% of turns were coded as LRE when all codes are included in consideration (Table 5.26), or 18% when the four over-lapping codes are removed from analysis (Table 5.27). Elaboration was once again high (23% or 28%). The proportion of uncoded turns was fairly low (6% or 8%) and this code was usually applied to unfinished utterances rather than off-topic discussion. No turns were coded using the more general reasoning code (RE). While the level of overall reasoning for this activity may be slightly lower than in other activities, there is strong evidence for the capacity to promote, operationalise and capture LRE in student dialogue since all reasoning turns are domain-specific.

Table 5.25 Odd one out LRE School A

Table 5.26 Odd one out LRE School A (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	85	26%
EL	77	23%
REI	19	6%
RE	1	0%
GRE	0	0%
LRE	49	15%
ARE	0	0%
CI	7	2%
SC	6	2%
RC	1	0%
A	48	15%
Q	6	2%
RB	1	0%
RW	0	0%
OI	10	3%
UNCODED	21	6%

Code	Frequency of instances	% instances
ELI	85	31%
EL	77	28%
REI	19	7%
RE	1	0%
GRE	0	0%
LRE	49	18%
ARE	0	0%
CI	7	3%
SC	6	2%
RC	1	0%
A		
Q		
RB		
RW		
OI	10	4%
UNCODED	21	8%

The extract below (Table 5.28) is from an activity using the target board format of 'odd one out' (see Section 4.13.1). Instead of the triangle format usually employed, students were presented with a grid (or target board) of possible adjectives which they then had to group. These adjectives were emotions taken from a poem, The Longboat's Story, written by another teacher and shared on the Times Educational Supplement (TES) educational resources website (Grahamespin, 2014). The first line of each of the three stanzas within the poem presents a list of three adjectives (e.g. "brave, courageous, fearless"). These three adjectives are usually linked but with subtle differences in meaning which may be difficult to articulate. The teacher intended to encourage students to consider precision within language and to explore nuances in meaning. Students were advised that each of the groups created from the target board had to contain at least three adjectives with clear justifications articulated for decisions to include and/or exclude certain words. Students were also encouraged to add additional adjectives to their groups with support from a thesaurus.

Table 5.27 Extract from odd one out lesson to promote LRE School A

Turn No.	Speaker	
1	Student 1	*I'm thinking weak, caring and fragile would go together because you're fragile, which means you're weak, so they have the same meaning. Caring is you listen to people, and then if you're fragile, instead of being fearless and courageous, you're really shy and stuff. Then weak is the same meaning to fragile.*
		…
2	Student 1	*I think timid, fragile and weak would go together.*
3	Researcher	*What do you think, [student 2]?*
4	Student 2	*I think the same because now that I know the meaning of timid, you know how you're fragile and it's like you're weak? It links with that because you hang back.*
5	Student 1	*Like the mice, where they hang back and they don't want to interfere with other people. The opposite, rats. Say the mouse has just found some food, the rat would just run up, push the mouse away and take it. It wouldn't care.*
		…
6	Student 2	*All of them are on the same side, and brave, it links to angry because when you're angry you can be brave against other people. For example, when someone takes something from you, you could be angry at them, but then when you go to stand up to them you could be very brave and you could be fierce with them. That's why I'd put ferocious in.*
7	Researcher	*Okay. What do you think?*
8	Student 1	*I don't agree with brave because brave has two meanings. You can be a good brave, say, you really want to help. Say somebody has got hurt and you know them, you really want to push to help them. The other meaning is where you're really brave and ferocious and you're really scary and you want to really, really win. I would put it with brave, strong and selfless.*
9	Researcher	*You wouldn't put brave in the angry and ferocious group?*
10	Student 1	*No. I think I would put determined in there because if you get too determined you can hurt someone's feeling and you can hurt people. You can become a bully and you can brag and stuff about it.*
		…
11	Student 2	*They all have the same meaning because angry means you can get mad with someone in different ways. Ferocious means when you've stood your ground, and it links with angry because once you've stood your ground, people will think that you're fierce and everything. Angry and fierce go together because when you get angry you attack them and when you're fierce you can attack them. When you're determined, if you go way too over the top you can get mad with someone and get angry, so it links.*

12	Researcher	*Okay, so determined at the far end of the scale, at the extreme, can lead to anger and being ferocious.*
13	Student 1	*Determined is the first level, angry the second level, and the third level is ferocious, when you get really, really angry.*
14	Researcher	*I really like that idea of levels. At the first stage you might feel determined. Then you might move to being angry and then that triggers you to be ferocious?*
15	Student 1	*I think the same goes for the first word group. It would be timid first and then you'd become fragile and then you'd become really, really weak.*

This extract demonstrates numerous instances of LRE. Turn 1 sees a possible group of three adjectives proposed by Student 1. This is justified by considering ways in which the words might have linked meanings. This group is modified in turn 2 and justified by Student 2 (turn 4) on the basis of an identified similarity between the new group of three. The meaning of the word 'timid' is then linked to an animal. Student 1 compares the behaviour of mice and rats exemplifying ways in which timidity can be observed and contrasted. Varying meanings or interpretations of 'brave' are explored in turns 6 and 8 with both positive and negative connotations discussed. Turn 11 clearly articulates links between 'angry', 'ferocious' and 'determined'. The student describes ways in which each feeling can lead to another implying the different levels of strength involved. This prompted me, as researcher, to introduce the idea of a scale (turn 12). This is extended and built upon in turns 13 and 15 where the student considers differential 'levels' and applies this organising construct to two sets of adjectives. Discussion in this extract is primarily at word level, with specific vocabulary and a particular word class considered. To justify task decisions, students explicitly drew upon and interrogated specific language, thus demonstrating LRE.
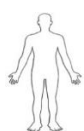
5.1.3.3   Role on the wall

One lesson (Y6) used role on the wall to promote LRE. Findings from this task provide evidence that domain-specific reasoning in English can be promoted, operationalised and captured. 15% of turns were coded as LRE when all codes are included in consideration (Table 5.29). This rises to 19% when the four potentially over-lapping codes are removed from analysis (Table 5.30). Elaboration was once again high (20% or 25%) as were elaboration invitations (26% or 32%). The proportion of

uncoded turns was low (3% or 4%) demonstrating the focused and dialogic nature of group discussion. 6% or 8% of turns were coded using the general reasoning code (RE). The much greater proportion of turns allocated the domain-specific code provides further evidence of the ability to promote, operationalise and capture LRE in student dialogue.

Table 5.28 Role on the wall LRE School B

Code	Frequency of instances	% instances
ELI	55	26%
EL	42	20%
REI	17	8%
RE	13	6%
GRE	0	0%
LRE	33	15%
ARE	0	0%
CI	0	0%
SC	4	2%
RC	0	0%
A	39	18%
Q	4	2%
RB	1	0%
RW	0	0%
OI	0	0%
UNCODED	7	3%

Table 5.29 Role on the wall LRE School B (overlapping codes removed)

Code	Frequency of instances	% instances
ELI	55	**32%**
EL	42	**25%**
REI	17	**10%**
RE	13	**8%**
GRE	0	**0%**
LRE	33	**19%**
ARE	0	**0%**
CI	0	**0%**
SC	4	**2%**
RC	0	**0%**
A		
Q		
RB		
RW		
OI	0	**0%**
UNCODED	7	**4%**

An extract of the transcript (Table 5.31) for the LRE role on the wall activity is provided below. The activity required students to complete a role on the wall diagram for Miss Evans, a character in Nina Bawden's, *Carrie's War*. Students were asked to consider her physical appearance and attributes which were recorded around the outside of the figure. They also had to consider her personality characteristics to be recorded inside of the outline. Students were asked to carefully consider the language and linguistic devices used by the author to create such impressions. The class were encouraged to justify any attributes recorded with close reference to the text.

Table 5.30 Extract from role on the wall lesson to promote LRE School B

Turn No.	Speaker	
1	Student 1	*I've found the description of Mrs [sic] Evans and it says, 'But Miss Evans looked nice, a little like a red squirrel, Carrie had once seen peering around a tree in a park. Reddish brown hair and bright button eyes, a shy, quivering look.'*
2	Researcher	*So, how are you going to use that evidence?*
3	Student 2	*You could say that she actually looked like a squirrel and that she acted like one, because she looked like one with her reddish brown hair and button eyes. And then you could say she acted like one, because she's very timid around Mr Evans and that.*
		…
4	Researcher	*Right, '…shy, quivering look' that's an interesting one, isn't it? Why might I think that's an interesting one?*
5	Student 2	*Because it's saying that she looked shy and quivering, but shy and quivering is like a feeling.*
		…
6	Student 1	*They could put a '…quivering look' on the appearance box, then put shy in the feelings box, because I don't think she would be quivering all the time. But she might be shy a lot of the time.*

The extract above, though short, demonstrates student engagement with language. In turn 1, Student 1 locates a quotation from the text to be used as evidence. Turns 3 and 5 then demonstrate student interpretations of the quotation. As part of this, features which are largely physical (such as hair colour and eyes) are distinguished from the character's actions and personality traits (timid, shy). The quotation includes a simile comparing Miss Evans to a red squirrel. Student 2 interprets

this quotation by suggesting that Miss Evans bears a physical resemblance to a squirrel and also enacts the type of behaviours a squirrel might exhibit (turn 3). This is neatly summarised in the statement: *"you could say that she actually looked like a squirrel and that she acted like one".* Students are then subtly guided by me to consider distinctions between physical and inward features (turn 4). Student 2 identifies the paradox between describing 'shy and quivering' in terms of a 'look', or appearance, when it also links to a feeling or characteristic (turn 5). Student 1 separates elements of this description by suggesting that 'quivering' is recorded around the outside of the role on the wall figure (as a physical description of appearance) with 'shy' contained within it (as an inward characteristic) (turn 6).

This extract demonstrates LRE. Student task decisions are justified with reference to specific vocabulary and linguistic devices drawn upon by the author. There is close engagement with this language where students reflect upon indicators of both physical and personality characteristics.

5.1.3.4   LRE by task

Figure 5.3 summarises evidence discussed above. Proportions are taken from those reported with the four overlapping codes removed. This prevents a skewed representation which might arise when instances of the four cross-cutting codes were high. All three task structures were able to promote dialogue which could be coded as LRE. Indeed, all task structures promoted a proportion of domain-specific reasoning of 18% or more of all transcribed dialogue (including any turns attributed the 'uncoded' code). The diamond ranking task saw the highest level of LRE yet all three structures show promise for their capacity to promote LRE. Future research might explore the potential of fortune lines to the promotion of LRE.
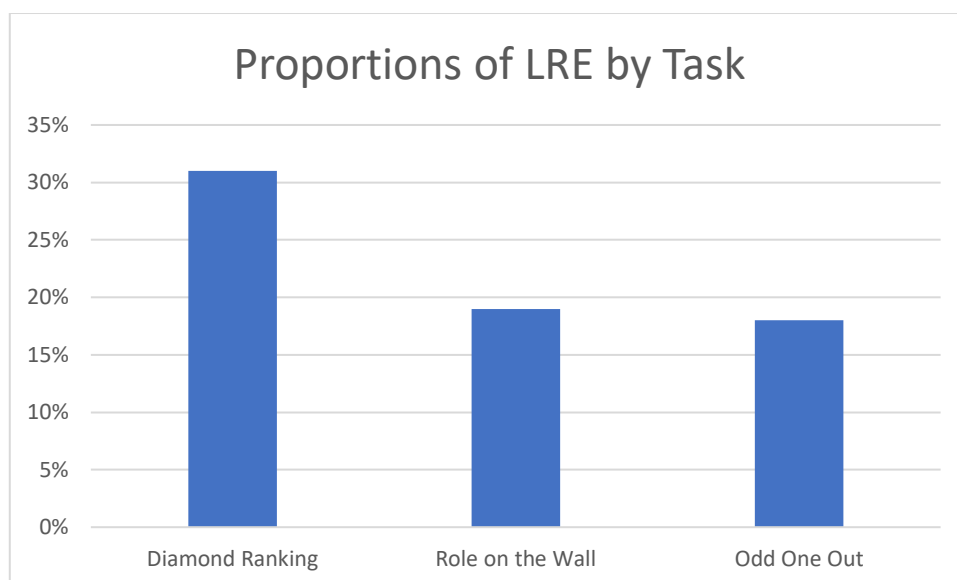
Figure 5.3 Proportions of LRE by Task

5.1.4   Conclusion

Overall, evidence from lessons conducted to target specific reasoning styles in primary English at two schools broadly supports the argument that reasoning styles can be promoted, operationalised, captured and measured. Figure 5.4 summarises evidence presented above. Proportions are taken from the researcher groups and exclude the four potentially cross-cutting CDAS codes (A, Q, RB and RW). In all tasks across all three reasoning styles, there was some evidence of discipline-specific reasoning. On two occasions (role on the wall to promote ARE and fortune lines to promote GRE), proportions of domain-specific reasoning are lower (5% and 6% respectively). Possible reasons for reduced proportions are discussed elsewhere (Sections 5.1.2.3 and 5.1.1.3). Evidence from all other activities is more promising: the proportion of discipline-specific reasoning in all other tasks is 15% or greater. This increases to 40% in the odd one out task designed to promote GRE. Even when the two tasks which found lower proportions of domain-specific reasoning are considered, the average proportion of discipline-specific reasoning across all 10 activities is 22%. This does not consider additional general reasoning displayed, or reasoning invitations. This study therefore observed group activities where discussants spent, on average, one fifth of the total discussion engaging in discipline-specific reasoning. This finding provides strong support for the possibility of promoting domain-specific reasoning in primary English lessons. It also suggests that these reasoning styles move beyond a theoretical existence to becoming possible to promote and capture empirically.
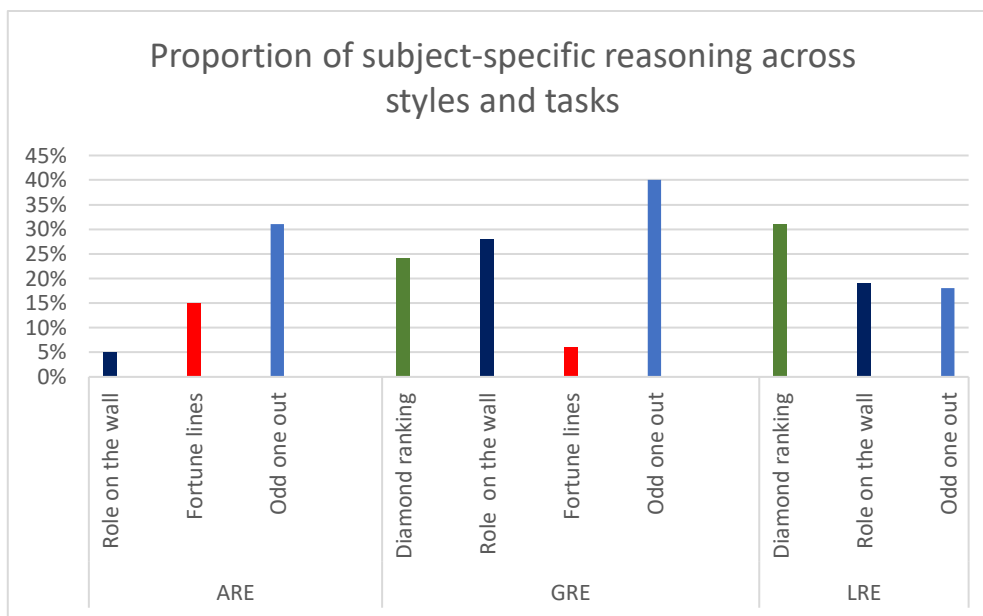
Figure 5.4 Proportion of subject-specific reasoning across styles and tasks

5.2   Task-based reflections

This project also explored issues related to task structure and design. Findings from both conceptual and empirical phases of the project suggest that styles of reasoning from the theoretical framework produced in Study One can be realised in primary English. The scaffolding tasks used to promote domain-specific reasoning also demand consideration. Findings presented below will consider the four task structures used in the empirical investigation and explore proportions of domain-specific reasoning according to each task. While such results are based on a small number of exploratory lessons, tentative consideration of task-specific affordances and constraints is permitted, as well as an exploration of the relative potential of each task for promoting domain-specific reasoning in primary English. Findings discussed below suggest that proportions of discipline-specific reasoning do vary by task. Moreover, proportions of domain-specific reasoning within each task vary according to reasoning style promoted. This indicates that some tasks are more likely to promote particular reasoning styles than others.
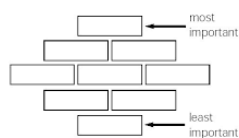
5.2.1   Diamond ranking

Figure 5.5 summarises evidence for diamond ranking and its capacity to promote discipline-specific reasoning in English. Proportions are taken with the four overlapping CDAS codes (A, Q, RB and RW) removed from analysis. This prevents a skewed representation which might arise when instances of the cross-cutting codes were high and used alongside other codes.
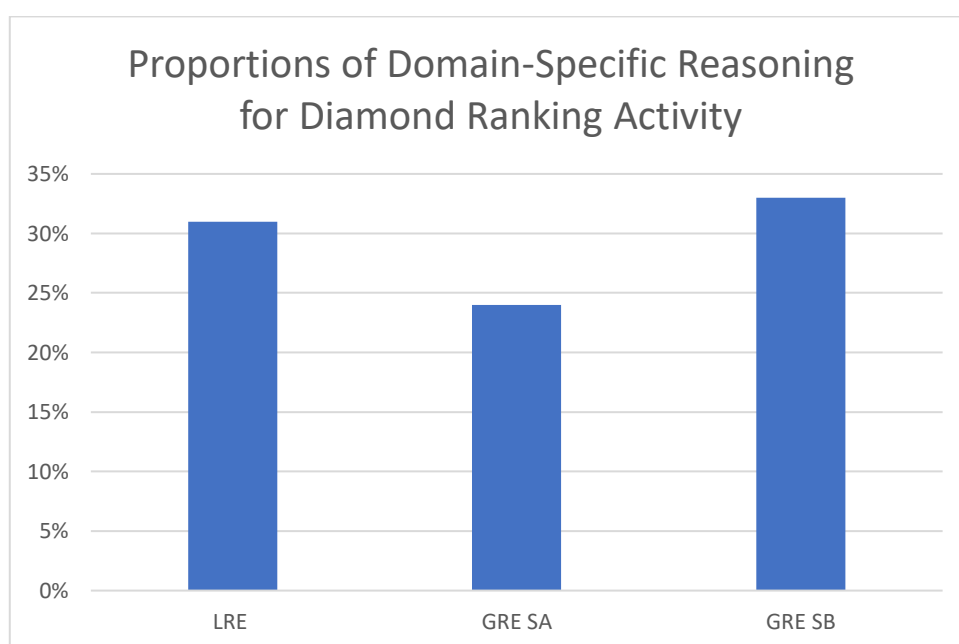
Figure 5.5 Proportions of Domain-Specific Reasoning for Diamond Ranking Activity

Diamond ranking was used to target GRE in two schools and LRE in one. A high proportion of domain-specific reasoning (24% or more of all dialogue including 'uncoded') was observed in all three lessons using diamond ranking. Evidence suggests that this task structure is promising in terms of its capacity to promote domain-specific reasoning styles in English. While diamond ranking was initially deemed least applicable to the promotion of ARE (in comparison to the other three task structures) and was not subject to formal exploration here, future efforts should explore the potential that this task structure holds to promote ARE given its promising findings for the other two reasoning styles.

5.2.2 Odd one out

Figure 5.6 summarises evidence for odd one out and its capacity to promote domain-specific reasoning in English. Again, proportions are taken with the four overlapping CDAS codes removed from analysis.

Figure 5.6 Proportions of Domain-Specific Reasoning for Odd One Out Activity

This task structure was used to target all three reasoning styles subject to formal exploration (GRE, ARE and LRE). A high proportion of domain-specific reasoning (18% or more of all dialogue including 'uncoded') was observed in all three lessons using odd one out. Among these lessons, the lesson targeting GRE saw the highest proportion of domain-specific reasoning (40%). While comparatively smaller, the LRE lesson saw 18% of all dialogue coded using the domain-specific reasoning code. Overall, evidence from odd one out tasks suggests its promise for promoting domain-specific reasoning in English.

5.2.3   Fortune lines

Figure 5.7 summarises evidence for fortune lines and its capacity to promote domain-specific reasoning in English. Again, proportions are taken with the four overlapping CDAS codes removed from analysis.
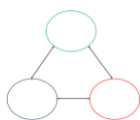

Figure 5.7 Proportions of Domain-Specific Reasoning for Fortune Lines Activity

Fortune lines was used to target GRE and ARE. The pattern of evidence is less conclusive than it is for the previous two task structures (diamond ranking and odd one out). A moderate proportion of domain-specific reasoning (15%) was found in the ARE lesson. However, only 6% of discipline-specific reasoning was observed in the GRE task. Possible reasons for this have been explored in Section 5.1.1.3. Future efforts should explore the potential of this task structure to promote GRE considering identified weaknesses of the lesson recorded here. Fortune lines should not be discounted for the promotion of GRE without further research. Similarly, while fortune lines was initially deemed least applicable to the promotion of LRE (in comparison to other task structures), future efforts might explore its potential to the promotion of LRE. Fortune lines was only used in two recorded lessons which further limits consideration of its affordances and constraints. Nevertheless, early findings tentatively suggest that fortune lines may be less likely to promote discipline-specific reasoning in primary English than the other three structures explored.

5.2.4   Role on the wall

Figure 5.8 summarises evidence for role on the wall and its capacity to promote domain-specific reasoning in English. Proportions are taken with the four overlapping CDAS codes removed from analysis.
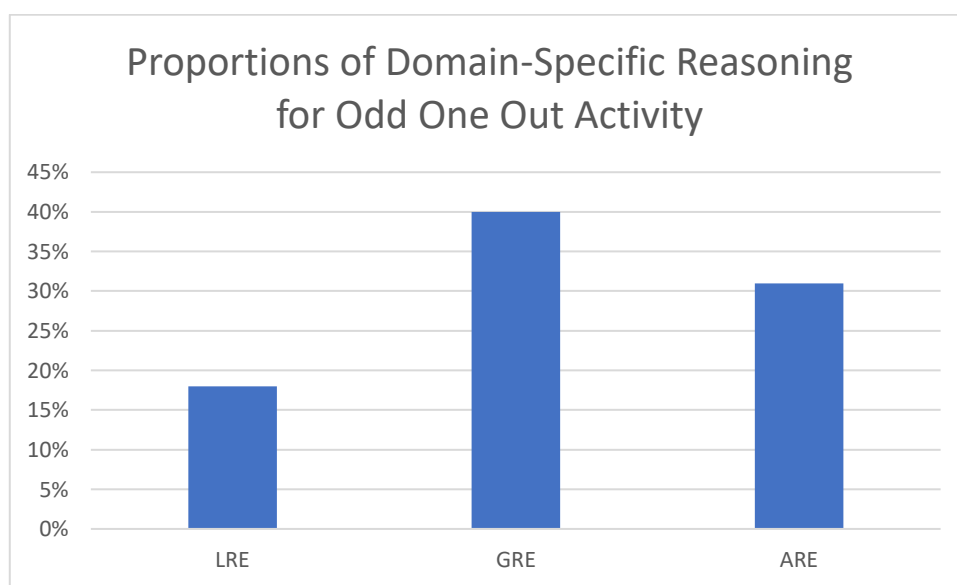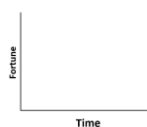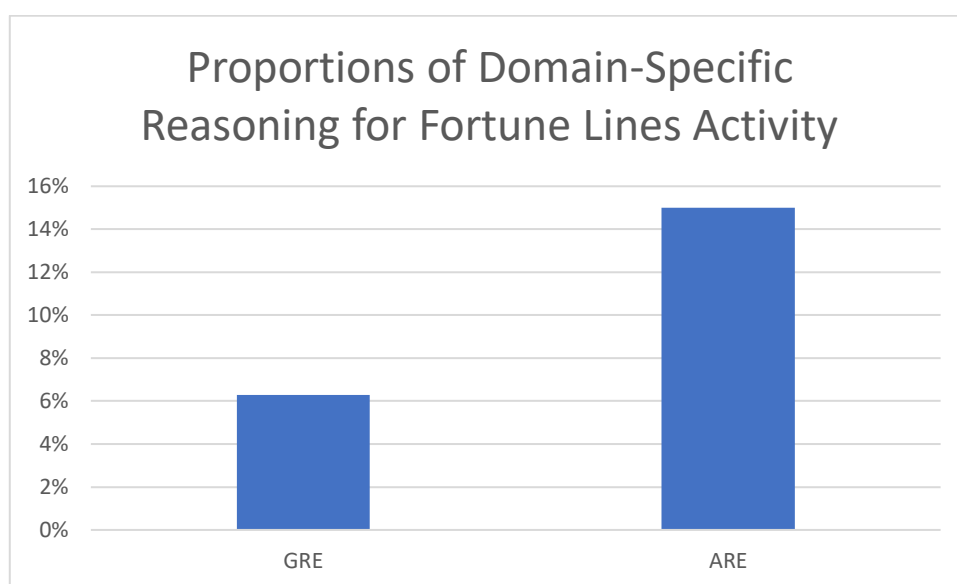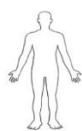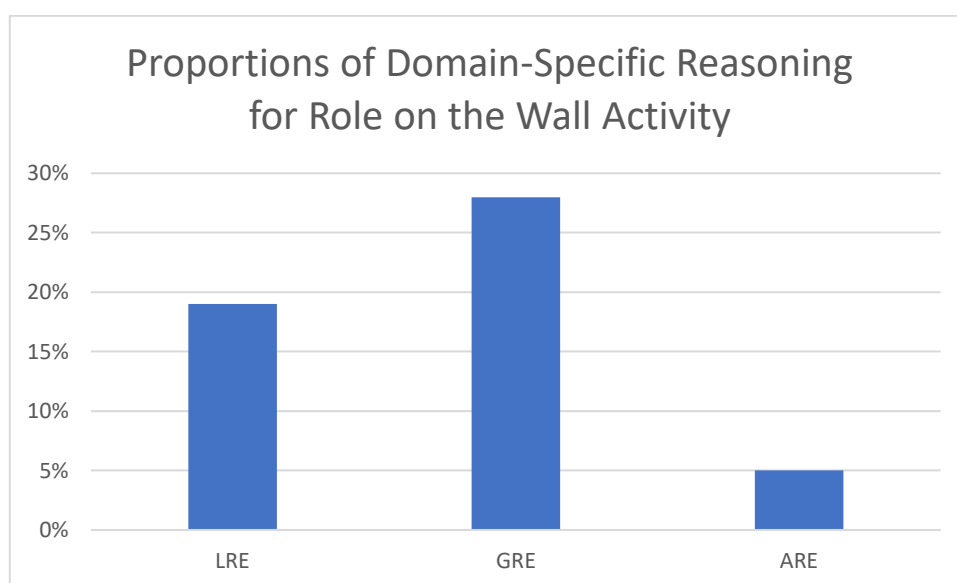

Figure 5.8 Proportions of Domain-Specific Reasoning for Role on the Wall Activity

This task structure was used to target all three reasoning styles selected for further exploration (GRE, LRE and ARE). A high proportion of domain-specific reasoning (19% or more of all dialogue including 'uncoded') was observed in lessons promoting LRE and GRE. Evidence from lessons using role on the wall to promote domain-specific reasoning in primary English is therefore promising. However, only 5% of discipline-specific reasoning was observed in the ARE task. Possible reasons for this have been explored in Section 5.1.2.3. These findings tentatively point to a reduced likelihood of promoting ARE using the role on the wall format. However, future efforts should explore the potential of this task structure to promote ARE considering identified weaknesses of the lesson recorded here and given its positive findings for the other two reasoning styles. This activity should not therefore be discounted in efforts to promote ARE without further research.

5.2.5   Conclusion

Section 5.1 explored the occurrence of domain-specific reasoning in primary English lessons. Evidence was presented which provides strong support for the capacity to promote and empirically capture three of the styles from the theoretical framework produced in Study One. This section has considered individual task structures and the relative potential of each in terms of promoting discipline-specific reasoning in primary English. Figure 5.9 summarises evidence presented above.
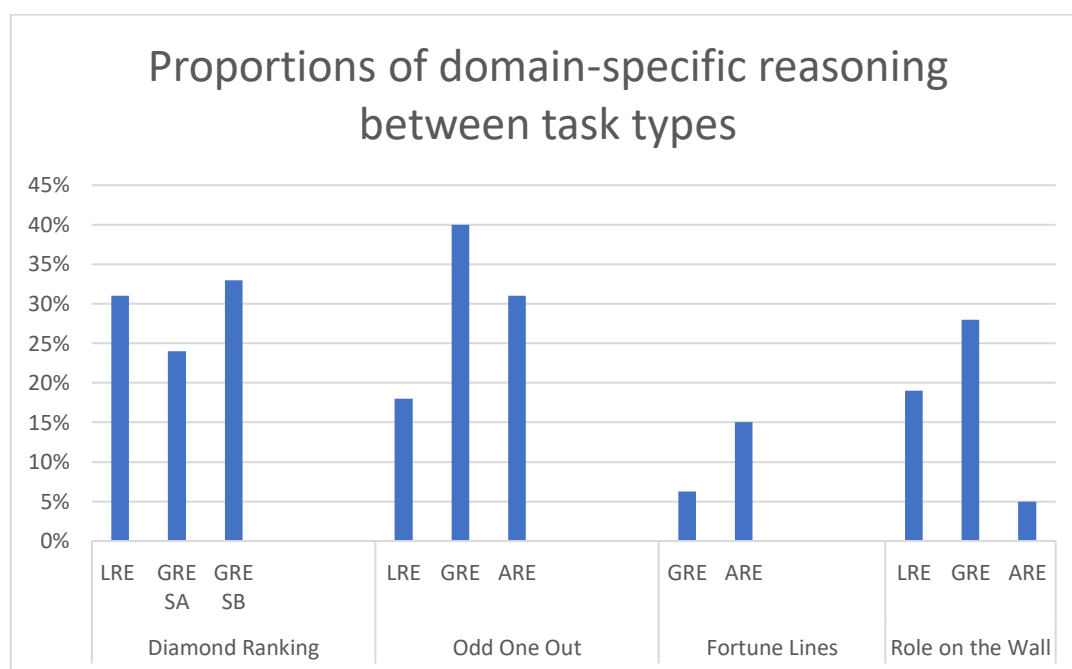
Figure 5.9 Proportions of domain-specific reasoning between task types

Overall, diamond ranking and odd one out structures saw larger proportions of domain-specific reasoning across the three reasoning styles. While there was variation in proportions of domain-specific reasoning within tasks according to reasoning style targeted, proportions were promising overall (at least 18%). Like odd one out, role on the wall was also used to target all three reasoning styles selected for empirical investigation. For two of the reasoning styles, proportions of discipline-specific reasoning are promising (19% or more), however, the ARE role on the wall lesson was less successful. Possible reasons for this and potential improvements are reflected upon in Section 5.1.2.3. Fortune lines offered some support for its value in promoting ARE (15%), although this was

modest compared to proportions observed in other tasks (diamond ranking and odd one out). Use of fortune lines to promote GRE did not see high proportions of domain-specific reasoning (6%). Again, possible reasons for this and reflections on how these might be improved are reflected upon in Section 5.1.1.3.

Findings discussed above are based on a small sample. Activities tended to be used only once to target a reasoning style and not every reasoning style was targeted by every task structure. Despite these limitations, overall evidence does indicate that proportions of domain-specific reasoning do appear to vary by task. While particular task structures seem to promote some reasoning styles better than others (see Section 5.1 for discussion of which tasks led to greatest discipline-specific reasoning within each of the reasoning styles), diamond ranking and odd one out activities seem to promote discipline-specific reasoning across the three styles most readily and to a greater extent. Findings from odd one out lessons suggest its utility and promise across all three reasoning styles explored in this project. Diamond ranking found similarly promising proportions of domain-specific reasoning but was not used to target all three styles.

5.3   Presence of adult support

The previous two sections reveal two important findings which have emerged from data gathered in this project. The first finding discussed in Section 5.1 suggests that domain-specific reasoning can be realised in primary English; that is, reasoning styles can be described, operationalised, captured, and measured. The theoretical framework can therefore be realised empirically. The second finding discussed in Section 5.2 suggests that proportions of domain-specific reasoning are likely to vary according to task structure(s) used. This section will focus on the third main finding: that domain-specific reasoning in primary English is likely to vary according to whether or not groups receive adult support.

Data in this section is organised according to reasoning style. Proportions of domain-specific reasoning across task structures will be presented with a key focus on comparing proportions according to group type. Two main comparison groups will be presented: groups working

independently (independent) and those working with me, as the researcher (researcher-supported). It is expected that groups working with me would have been supported and guided to demonstrate higher proportions of domain-specific reasoning than groups working independently. However, if such styles can be promoted and realised in student dialogue with support from scaffolding tasks, it would be expected that independent groups should also demonstrate domain-specific reasoning, even to a lesser extent. Findings presented below broadly confirm these expectations although there are variations across styles and tasks. Interestingly, on two occasions, independent groups demonstrated higher proportions of domain-specific reasoning than the equivalent researcher-supported group.

5.3.1   Genre-based reasoning

While all four task structures were used to promote GRE, unfortunately, it was not possible to record an independent group for the fortune lines activity. Since there is no capacity to compare proportions of GRE within the fortune lines task, this task has been removed from consideration in this section. In addition, while two diamond ranking lessons were recorded, only one of those recorded an independent group. An average of GRE is taken for the two lessons with a researcher-supported group but only the independent group from the activity in School B can be included for comparison.

Figure 5.10 illustrates proportions of GRE across tasks. Proportions are taken with the four overlapping CDAS codes removed. This prevents a skewed representation which might arise when instances of the four cross-cutting codes were high.
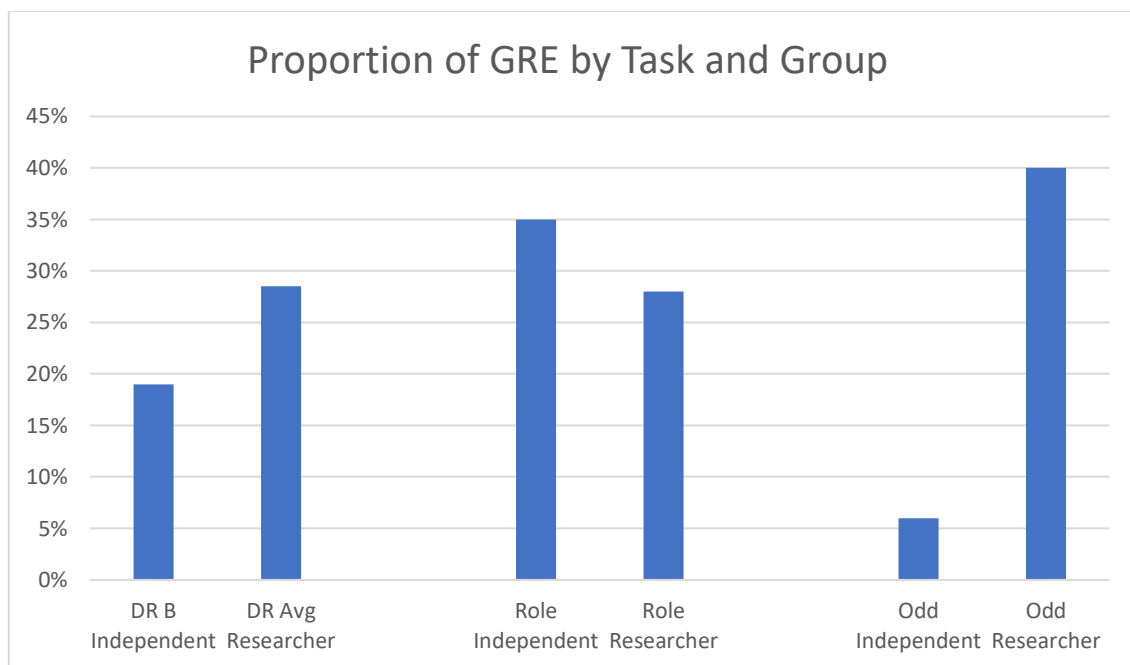
Figure 5.10 Proportion of GRE by Task and Group

In all but one instance, proportions of domain-specific reasoning are fairly high (19% or more) for both researcher-supported and independent groups. The independent group using odd one out departs from this pattern with only 6% GRE demonstrated.

For diamond ranking and odd one out, patterns of GRE between group types align with initial expectations. In these two activities, proportions of GRE are higher in groups supported by me. Interestingly, for the role on the wall activity, proportions of GRE are higher in the independent group. This finding indicates the high levels of GRE possible without support from a teacher/researcher.

Overall, despite the low proportion of domain-specific reasoning demonstrated by the independent group using odd one out, overall GRE proportions and comparisons are promising. While there tends to be a higher proportion of GRE in groups supported by me, proportions are also noteworthy in independent groups.

5.3.2 Analogy-based reasoning

While three task structures were used to promote ARE, unfortunately, it was not possible to record an independent group for the fortune lines activity. Since there is no capacity to compare proportions of ARE for fortune lines, this task has been removed from consideration in this section. As mentioned in previous sections (5.1.2; 5.2.1), diamond ranking was not used to promote ARE.

Figure 5.11 illustrates proportions of ARE across both tasks subject to comparison. Proportions are taken with the four overlapping CDAS codes removed.

Figure 5.11 Proportion of ARE by Task and Group

These comparisons broadly follow the pattern observed when comparing groups in GRE tasks. Greater or equivalent proportions of domain-specific reasoning are observed in the researcher-supported group. Odd one out demonstrates a higher proportion of ARE in the group supported by me (31%) compared to the group working independently (24%). Despite the difference across group types, both groups demonstrate an encouraging proportion of domain-specific reasoning.

Unfortunately, proportions are not so promising for the role on the wall activity (5% for both groups). Possible reasons for this are explored in Section 5.1.2.3. Briefly, low proportions seem to reflect the way in which the task was designed and implemented, with explicit comparisons not required throughout the task. Reflections on how these issues might be addressed are also included in Section 5.1.2.3. Despite the low proportions of ARE in the role on the wall activity, the equal proportions of ARE demonstrated suggest that these levels were not dependent on my presence as researcher and were possible without additional direction.

Overall, despite the low proportion of domain-specific reasoning demonstrated by both group types in the role on the wall ARE task, comparisons for both tasks suggest that domain-specific reasoning is not dependent on the presence and contributions of the researcher. Proportions of ARE observed in odd one out are noteworthy in both group types, although higher proportions in the researcher-supported group may indicate variations in proportions of domain-specific reasoning according to level of support received.

5.3.3   Language-based reasoning

Three task structures were used to promote LRE. As mentioned in previous Sections (5.1.3; 5.2.3), fortune lines was not used to promote LRE. Figure 5.12 illustrates proportions of LRE across tasks. Proportions are taken with the four overlapping CDAS codes removed from analysis.
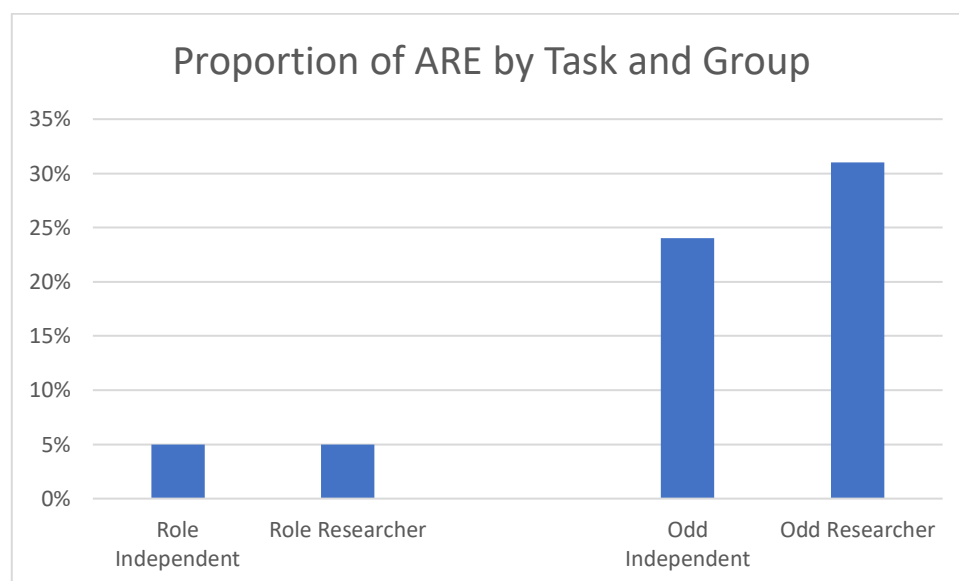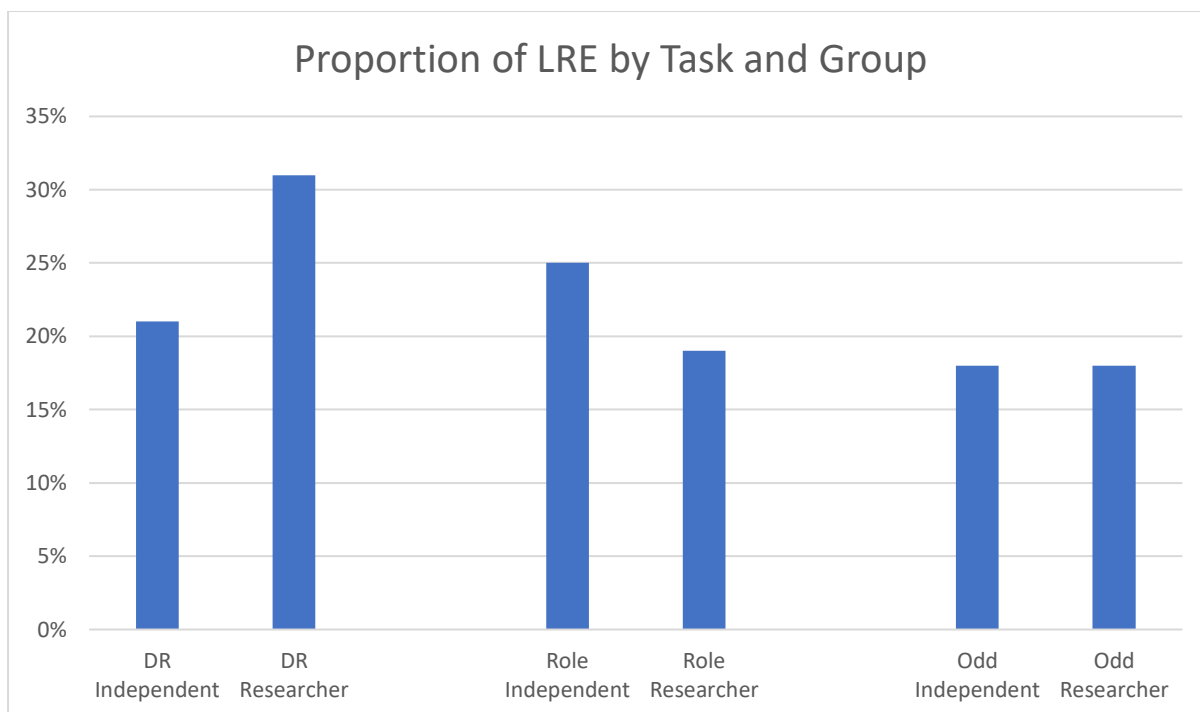
Figure 5.12 Proportion of LRE by Task and Group

Comparisons broadly follow patterns observed when comparing groups in GRE and ARE tasks, with greater or equivalent proportions of domain-specific reasoning in researcher-supported groups. As was the case for GRE, one task saw a higher proportion of domain-specific reasoning from the independent group. Promisingly, in all tasks, proportions of LRE are fairly high (18% or more) for both researcher-supported and independent groups.

For the diamond ranking activity, patterns of LRE between the two group types follow what would be expected: proportions of LRE are higher in the group supported by the researcher (31% compared to 21% in the independent group). Despite the difference across group types, both of these groups demonstrate an encouraging proportion of domain-specific reasoning.

In a similar instance to the GRE role on the wall findings discussed above (Section 5.3.1), proportions of LRE in the odd one out task are equal in independent and researcher-supported groups (18%). This finding indicates the levels of LRE possible without requiring support from a teacher/researcher. Interestingly, proportions of LRE in the role on the wall task were slightly higher in the independent group (25%) than the group supported by the researcher (19%). Both findings suggest a noteworthy proportion of LRE.

Overall LRE proportions and comparisons are promising. There is a relatively high amount of LRE demonstrated across all three tasks in both group types. In the diamond ranking activity, a higher proportion of LRE was observed in groups supported by me. Yet proportions of LRE are equal between group types in the odd one out task, and the role on the wall task saw a higher proportion of LRE in the independent group. While not consistently demonstrating the pattern of proportions expected when comparing independent and researcher-supported groups, these findings demonstrate the capacity of students to demonstrate LRE even without support from an adult.

5.3.4   Conclusion

Overall, comparisons between group types across reasoning styles and task structures provide tentative support for the expectation that those in a group supported by a researcher/teacher would demonstrate a higher proportion of domain-specific reasoning than those working independently.

Figure 5.13 summarises comparisons discussed above. Proportions are taken with the four overlapping CDAS codes removed from analysis. This prevents a skewed representation which might arise when instances of the four cross-cutting codes were high.
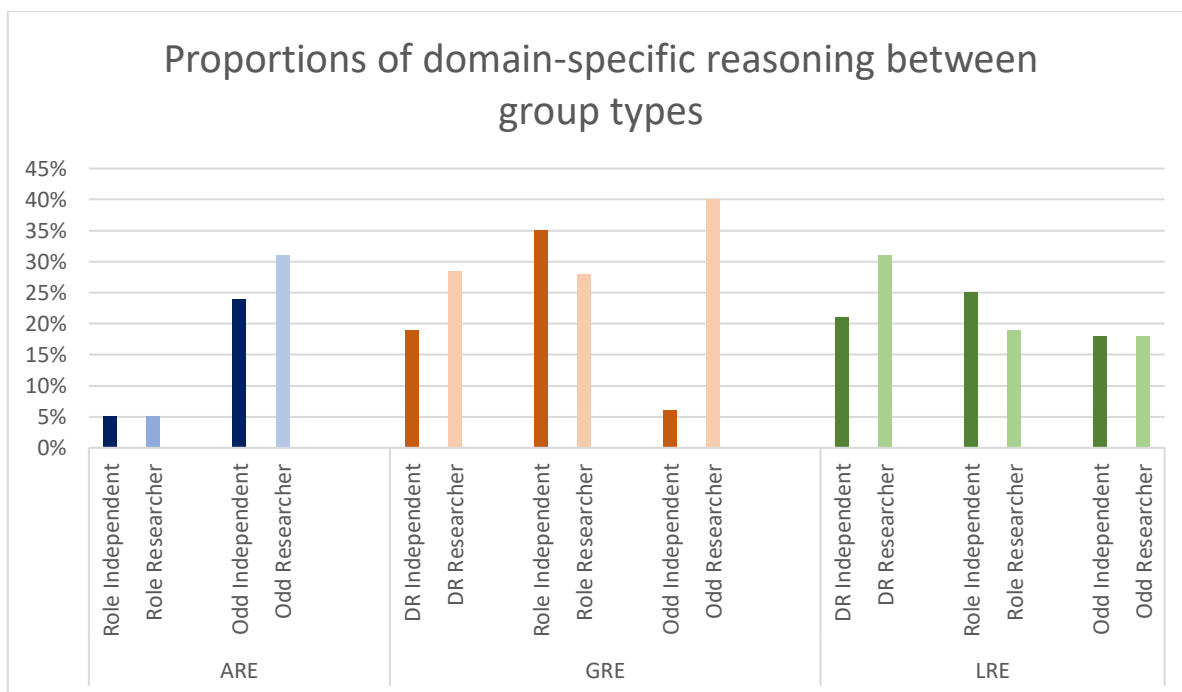
Figure 5.13 Proportions of domain-specific reasoning between group types

Figure 5.13 demonstrates that in half of the tasks with both an independent and a researcher-supported group (4 out of a total of 8), the researcher-supported group demonstrated a higher proportion of domain-specific reasoning. In two tasks, proportions are equal. In another two tasks, the proportion of domain-specific reasoning is higher in the independent group.

This evidence illustrates the main finding of the empirical phase of this project: that styles of reasoning in English can be promoted, realised, captured and measured in the dialogue of primary-aged students. There is also demonstration of the secondary finding: that proportions of domain-specific reasoning vary according to task structure used. Moreover, evidence summarised in figure 5.13 suggests a third important finding: that proportions of domain-specific reasoning vary according to whether or not adult support was received.

5.4 Conclusion

Evidence presented in this chapter reveals three main messages. Firstly, styles of reasoning identified as important in primary English and contained in the theoretical framework of reasoning styles produced in Study One can be realised in the primary classroom. These styles move beyond a theoretical existence, to becoming empirically observable and measurable. Secondly, proportions of domain-specific reasoning appear to vary according to the task structure used, with the odd one out and diamond ranking formats observing the highest proportions on average. Thirdly, proportions of domain-specific reasoning appear to vary according to whether adult support was received, or groups worked independently. While not conclusive, on average, higher proportions were observed in researcher-supported groups. These findings are based on a small-scale exploratory study. They are therefore presented as indicative, rather than representative. The next chapter will explore these main messages considering their relation to existing literature.

6   Discussion

Three main messages emerge from findings presented in the previous chapter. The first relates to the realisable nature of (at least three) reasoning styles in English. These reasoning styles have been targeted and empirically captured in the dialogue of primary-aged children, who are at an early stage on the path towards disciplinary accomplishment. The second message relates to the variation in proportions of domain-specific reasoning across task structures. Some task structures seem to have an increased likelihood of promoting discipline-specific reasoning than others. The third message relates to the variation in proportions of domain-specific reasoning according to the level of support received. Broadly, having adult support seems to increase the likelihood of students engaging in domain-specific reasoning. These messages have been presented and supported with empirical findings in the previous chapter. This chapter will critically examine these messages considering existing literature.

6.1   Key Finding One: Occurrence of domain-specific reasoning styles in primary English

A main aim of this project is to consider domain-specific reasoning styles in English and to explore whether these can be realised in primary-aged students with support from scaffolding tasks. Study One (Chapter 3) presents a theoretical rationale for the framework of reasoning styles developed in this project. Yet this project is fundamentally pragmatic in its intentions. The framework of reasoning styles had to be of practical value which meant that styles developed in the theoretical phase had to be realisable in primary English lessons.

Section 5.1 presented empirical findings for three of the theoretical reasoning styles: genre-based reasoning (GRE), analogy-based reasoning (ARE) and language-based reasoning (LRE). Reasons for selecting these three styles are offered in Section 4.6 but largely rest on their general appropriateness and prevalence at this stage of development (KS2) in English. Proportions of discipline-specific reasoning were presented for each task structure used to promote these three styles. Findings not following typical patterns were reflected upon.

In each task across all three reasoning styles, there is some evidence of discipline-specific reasoning. On all but two occasions (elaborated upon in Section 5.1), the proportion of discipline-specific reasoning is 15% or greater. The average proportion of domain-specific reasoning for researcher-supported groups across all 10 activities included in analysis is 22%[6]. Students therefore spent, on average, one fifth of the total discussion engaging in discipline-specific reasoning.[7] This is in addition to any general reasoning observed. This finding provides strong support for the possibility of promoting discipline-specific reasoning in primary English lessons. It also suggests that these reasoning styles move beyond existing in a theoretical capacity to being realisable in the primary classroom. The project's main finding, based on evidence presented, is that reasoning styles can be promoted, captured, operationalised and measured.

Findings discussed above demonstrate the possibility of promoting a higher proportion of reasoning than might normally be expected in primary English lessons (discussion will soon make comparisons between proportions observed in this study and those considered to represent dialogue in 'typical' primary classrooms). What is more, reasoning can represent discipline-specific reasoning styles (supported by a theoretical framework of reasoning styles for primary English and the use of open-ended task structures). These findings can be considered alongside other theoretical perspectives. This section will therefore consider the major finding of the project, that it is possible to promote, capture, operationalise and measure discipline-specific reasoning in primary English, alongside: metaphors for learning, sociocultural theory, CoP theory, the discipline of cognitive history, notions of discipline-specific practices and reasoning 'styles' literature.

The Literature Review (Chapter 2) discussed two main metaphors for the process of learning: the acquisition and the participation metaphor. As was discussed, the main aim of this project is to develop students' capacity to reason according to disciplinary-established, disciplinary-required and discipline-specific practices. While it might be hoped that these reasoning practices become

[6] This proportion is taken when the four potentially cross-cutting CDAS codes (Agreement, Querying, Reference Back and Reference to Wider Context) are removed from analysis. Reasons for this removal are made clear in Section 5.

[7] Differences observed between independent and researcher-supported groups are discussed in Section 5.3. The researcher-supported condition represents the optimum setting for promoting discipline-specific reasoning. This project ultimately wants to explore whether promoting and capturing reasoning styles in English is possible (rather than probable). Nevertheless, evidence from independent groups in terms of proportions of disciplinary-based reasoning is promising.

internalised by individuals, (Mercer (2013) proposes three possible mechanisms for this process of internalisation; considered in Section 2.2.2), this goal is not necessary to the aspirations of this project. Rather, it is hoped that students become more proficient at participating in disciplinary-established norms and practices. Focus remains on the process of learning to reason, seeking ways in which this process can be facilitated. In this respect, the participation metaphor is a useful lens through which the empirical phase of the project can be considered. It might be asked whether activities developed to promote specific reasoning styles supported students' capacity to participate in discipline-specific ways. These metaphors will be considered further below.

6.1.1 Sociocultural theory

Sociocultural theory is considered in some depth in Section 2.2.2. Although goals of internalisation in sociocultural theory can be considered alongside the 'acquisition' metaphor of learning, the participation it requires and emphasises also suggests its relevance to the participation metaphor (see Section 2.1). Briefly, sociocultural theory emphasises "the cultural formation of the mind" (Wertsch, 1985) and suggests the importance of language and other tools to mediate knowledge (Mercer, 2000; van Drie & van Boxtel, 2008; Vygotsky, 1962, 1978; Wertsch, 1991; Wolfe & Alexander, 2008). The importance of communication and interaction is clear (Fernández et al., 2001; Howe, 2010; Tiberghien & Malkoun, 2009) with knowledge shared and constructed jointly (Mercer, 2007). Thus, in sociocultural theory, knowledge and reasoning is considered to exist first in society before becoming internalised (or at least practiced) by individuals.

Findings from this project complement major tenets of sociocultural theory. Development of the framework of reasoning styles (Chapter 3) required immersion in disciplinary practices of English literature and primary English. Reasoning styles in the theoretical framework created here therefore represent culturally developed practices shared and used within the discipline. Cultural development of these practices is illustrated by briefly considering historical developments in literary theory and critique. Emphasis on interaction in sociocultural theory was embraced in this project by foregrounding the importance of collaborative group work to the promotion of disciplinary-based reasoning. The empirical phase of the project also required close engagement with language and principles of dialogue, as emphasised in sociocultural theory. Dialogic tasks created and used in the

exploratory study required the reasoning styles from the framework to be articulated and realised in language within group discussion. As already indicated, this project does depart from sociocultural theory in that no claims regarding internalisation of reasoning practices are made or indeed required. Given the emphasis on language and dialogue within sociocultural theory, consideration will now move to reflect on findings from this study in light of research and theory based on classroom dialogue.

6.1.2 Patterns of dialogue: moving from general to domain-specific practices

The prevalence of IRF patterns of teacher-student dialogue is identified in a systematic review of research spanning over forty years (Howe & Abedin, 2013; see Section 2.7.3). The lack of collaborative group work in classrooms has also been noted (Blatchford et al., 2003; Comber et al., 1999; Galton et al., 1980; Howe, 2017; Howe & Abedin, 2013). These findings may partially explain the lack of educationally productive dialogue in many primary classrooms.

Findings briefly reported in Section 6.1 and considered in greater depth in Chapter 5 suggest that this exploratory study did support student participation. Even without considering the discipline-specific reasoning element, activities produced a promising proportion of productive, or 'dialogic' talk. Vrikki, Wheatley, Howe, Hennessy and Mercer conducted a study involving 36 primary classes in England which aimed "to examine the extent to which the forms [of productive classroom dialogue] are embedded within current practice in English primary schools" (Vrikki et al., 2019, p. 1). Each class had two lessons recorded and included in analysis (from either maths, English or science lessons). The authors question the widespread belief that productive forms of dialogue are always scarce in primary classrooms, recognising "pockets of excellence" (Vrikki et al., 2019, p. 14). However, they also identify the huge variation in relative occurrence of these forms and the influence of teacher professional development on their likelihood. Vrikki et al.'s (2019) study represents a useful source of comparison for the findings of this study. Although not necessarily applicable to all English primary classrooms, Vrikki et al.'s findings are based on observed dialogue patterns from a fairly large sample. The study reports observed frequencies of forms of dialogue captured in CDAS (also used in this study). These can be loosely considered to represent likely proportions of dialogue in a typical primary classroom which can then be compared to those found

in this study. It must be stressed that this thesis makes no claims regarding the generalisability of the study's findings: it has been made clear that this project is exploratory. Similarly, Vrikki et al.'s findings are not uncritically accepted as being generalisable to all primary classrooms. For example, teachers participated in Vrikki et al.'s study voluntarily and there may be a difference between teachers likely to participate in a study of classroom dialogue and those unlikely to volunteer participation. It is likely that teachers who volunteered privilege the value of talk and dialogue in their classroom. Thus, while they might not be representative of all teachers, they may represent teachers who similarly value the role of dialogue. Moreover, these teachers knew that lessons would be recorded and analysed, with a specific focus on dialogue. It is possible that teachers would want to present a favourable impression and demonstrate 'good' practice. Again, this might depart from teachers not involved in the study or even these teachers in everyday practice. While these criticisms and potential biases are acknowledged, data in this study still compares favourably in terms of dialogic features, despite the possibility of teachers demonstrating better than typical practice in Vrikki et al.'s analysis of dialogue in existing classroom practice. Vrikki et al.'s data therefore represents and is used as a useful source of available, relevant comparison. It represents a way in which the reasoning styles 'intervention' explored here can be assessed in terms of improvements (or not) to student engagement in productive forms of dialogue compared to standard practice.

Findings from this exploratory study demonstrate the educationally productive forms of dialogue which were promoted. Of all recorded group tasks, proportions of 'uncoded' turns were never greater than 10% for an individual task and were often below 5%. Moreover, the 'uncoded' description did not simply apply to off-task talk moves, but was required when a new (but often pertinent) point was made by students which did not elaborate on something previously stated or explicitly articulate reasoning. Other categories (excluding 'agreement' and 'other invitation') are considered to represent productive forms of educational dialogue, based on previous research, by the researchers who designed the CDAS coding framework (Vrikki et al., 2019; Hennessy et al., 2016; Littleton & Mercer, 2013).

Table 6.1 illustrates average proportions of each dialogue move in Vrikki et al.'s (2019) study and those found in the present project. Reasoning codes are excluded but will be presented next. Vrikki et al. (2019) do not present proportions in their paper, instead stating mean frequencies for each code. Proportions were calculated for Vrikki et al.'s data which allowed comparison with proportions

observed here. Proportions are taken when all CDAS codes are included. At other times, the four cross-cutting codes, agreement (A), querying (Q), reference back (RB), reference to wider context (RW), are removed from analysis. Reasons for considering proportions when these codes are excluded are explained in Section 5.1. Briefly, including cross-cutting codes in analysis may skew overall proportions reported, particularly when utterances were sometimes allocated three codes. If these secondary codes were retained when calculating overall proportions, the amount of dialogue serving other functions may have been masked. Chapter 5 therefore presents proportions when codes are included and when they are excluded. Nevertheless, for reasons of comparison with Vrikki et al.'s (2019) data, all four cross-cutting codes were included when calculating overall proportions here.

Proportions are provided for researcher-supported group data and when averaging findings across both researcher-supported and independent conditions. Descriptive statistics are used to report this data. Reasons for selecting descriptive rather than inferential statistics are based on the non-random sample (which inferential tests rely on) and the exploratory nature of the project (see Section 4.10). Proportions presented below provide a broad comparison of the relative frequency of each dialogue move within group tasks but do not provide a precise comparison. However, since the project aims to establish whether domain-specific reasoning can be elicited in student dialogue and reliably coded, descriptive statistics reporting proportions are sufficient.

Table 6.1 Average proportions of dialogue move in Vrikki et al.'s (2019) study and those in the present project, excluding reasoning codes

Dialogue form/CDAS code	Average overall proportion in Vrikki et al. (2019)	Average overall proportion in researcher-supported groups in present project	Average overall proportion combining researcher-supported and independent groups in present project
ELI (Elaboration invitation)	4.4%	15.1%	12.7%
EL (Elaboration)	11.7%	21.0%	22.0%
CI (Co-ordination invitation)	0.0%	0.8%	0.6%
SC (Simple co-ordination)	0.1%	1.7%	1.3%
RC (Reasoned co-ordination)	0.0%	0.0%	0.0%
Q (Querying)	2.7%	2.4%	4.6%
RB (Reference back)	0.9%	0.5%	0.3%
RW (Reference to wider context)	0.6%	0.0%	0.6%
A (Agreement)	11.6%	20.1%	20.5%
OI (Other invitation)	20.3%	2.4%	3.4%
UC (Uncoded)	37.0%	3.7%	4.8%

The proportion of uncoded turns in this project compares favourably to those observed by Vrikki et al. (2019). They report an overall mean of 246.68 instances of 'uncoded' turns. When the frequencies across all codes are totalled and a percentage of the total for each is calculated, Vrikki et al.'s (2019) data indicates that 37% of dialogue in their study is 'uncoded'. When data from the researcher-supported group in this study is averaged, the average proportion of uncoded turns across all recorded activities represents just 3.7% of all turns. This only slightly increases to 4.8% when data from independent groups are combined with data from researcher-supported groups. Low proportions of uncoded turns suggest the focused and dialogic nature of the vast majority of group discussion within activities recorded in this project. Comparisons to proportions observed in Vrikki et al.'s (2019) study suggest that the high level of focus and engagement with productive forms of dialogue observed in this study may not be typical of dialogue patterns in most primary classrooms.

Findings from other CDAS categories also compare favourably to those observed in 'typical' practice, a proxy of which is observed in Vrikki et al.'s (2019) study. Thus, proportions of elaboration (EL) and elaboration invitations (ELI) are much greater in the present study (22% EL compared to 11.7% in Vrikki et al.'s (2019) study; 12.7% ELI compared to 4.4%). Co-ordination categories (CI, SC and RC) observe similar proportions across both datasets, although to a marginally higher degree on average in this project. Potential difficulties students may face in terms of co-ordination are reflected upon in Vrikki et al.'s (2019) paper although they are beyond the focus of enquiry here. Proportions of querying (Q) and references back (RB) are similar across the datasets. There is a greater proportion of agreement in the findings of the present study (20.5% compared to 11.6% in Vrikki et al.'s (2019) study), which might be partially explained by the cross-cutting nature of the code. This means that it can be used alongside other codes (see Chapter 5). There were fewer turns coded as 'other invitation' in this project (3.4% compared to 20.3%). This might suggest that the invitations used in the present study tended to be more specific than general (i.e. an elaboration or reasoning invitation specifically). This is supported by the greater proportion of turns coded using specific invitational codes in the study reported here. The specific nature of these invitations probably had a role to play in the greater proportions of elaboration and reasoning observed, although this is speculative. Discussion will now move from consideration of general features of dialogue observed across both datasets, to specifically consider reasoning.

When focusing on reasoning, as part of the repertoire of practices considered to represent dialogic teaching and learning, proportions observed in this exploratory study also compare favourably to those observed in 'typical' classroom practice (a proxy of which is taken from Vrikki et al.'s (2019) study). Table 6.2 presents average proportions of reasoning dialogue in Vrikki et al.'s (2019) study compared to those found in the present project (offering proportions for the researcher-supported group only, and for an average of researcher-supported and independent groups).

Table 6.2 *Average proportions of reasoning in Vrikki et al.'s (2019) study and those in the present project*

Dialogue form/CDAS code	Average overall proportion in Vrikki et al. (2019)	Average overall proportion in researcher-supported groups in present project	Average overall proportion combining researcher-supported and independent groups in present project
REI (Reasoning invitation)	**2.8%**	**7.4%**	**6.2%**
RE (Reasoning)	8.0%	8.3%	7.6%
Discipline-specific RE	N/A	17.0%	15.3%
Total RE (not including invitations)	**8.0%**	**24.7%**	**22.9%**

Table 6.2 demonstrates the greater proportion of reasoning invitations (REI) in the present project, when data from both group types are combined (6.2% compared to 2.8%). To some extent, this might help to explain the greater proportion of reasoning overall in the present study. The table illustrates the similar proportion of turns coded as reasoning (RE) between the two studies (7.6% here compared to Vrikki et al.'s (2019) 8%). However, the proportion from the present project does not include turns coded using the discipline-specific reasoning codes developed in this study. If using the non-adapted CDAS framework, all these domain-specific turns would have been allocated the general RE code. The total average reasoning in this study is therefore 22.9% compared to 8% in Vrikki et al.'s (2019) research. This study therefore found more than three-times the proportion of reasoning than in Vrikki et al.'s (2019) research. Although this may be unsurprising given the differences in focus between the two studies (one observing current practice and one trying to improve upon it), increased proportions of domain-specific reasoning were not guaranteed. The comparison adds supports to the project's main finding: that domain-specific reasoning can be elicited in student dialogue. This helps to address the second RQ.

To return to the participation metaphor of learning, evidence in this study provides strong support for the capacity to promote student participation in disciplinary-based dialogue practices. Comparisons across general CDAS codes reveal the largely enhanced dialogic nature of the collaborative group tasks in this study compared to those observed in Vrikki et al.'s (2019) study of 36 primary classrooms. The general improvement in levels of dialogic practices, and particularly

reasoning, because of tasks developed in this project is promising. Even more encouraging, this large proportion of reasoning can be considered (operationalised and coded) as representing discipline-specific reasoning. Discussion will now briefly consider arguments relating to the prevalence of domain-specific reasoning styles alongside existing theory and literature and will also consider coding issues.

6.1.3 'Styles' literature: domain-specific reasoning practices

Reasoning styles have been defined as "a pattern of inferential relations that are used to select, interpret, and support evidence for certain claims" (Bueno, 2012, p. 657). In line with sociocultural theory, it is argued that academic domains have developed particular styles of reasoning to draw conclusions and to evaluate them (Bueno, 2012; Crombie, 1995; Hacking, 1992, 2012; Kind & Osborne, 2017; van Drie & van Boxtel, 2008). Drawing on cognitive history, proponents of discipline-specific reasoning styles have argued for careful examination of 'products' from the culture: reasoning can be found as ways of arguing in discussion and written texts, in line with sociocultural theory. Calls to look towards the culture of interest when attempting to describe prevalent reasoning styles have been made (Carrithers et al., 1990; Hacking, 1982; Roth, 1987; Taylor, 1982; Ziman, 1978) with extensive work in this endeavour already undertaken in science (Crombie, 1995; Hacking, 2012).

The concept of reasoning styles and the field of cognitive history draw clear parallels to CoP theory (Lave, 1988; Lave & Wenger, 1991), the notion of epistemes (Perkins, 2006) and to the idea of genres as "cultural tools designed for pursuing collective scholarship and inquiry" (Mercer, 2013). There are also strong links to arguments related to disciplinary literacy (EEF, 2019; Fang, 2012; Hinchman & O'Brien, 2019; O'Brien, Moje & Stewart, 2001; Shanahan & Shanahan, 2012). These ideas are elaborated upon further in Chapter 2. Findings from this study lend support to such theories and academic fields, by suggesting the possibility of targeting discipline-specific reasoning styles and then promoting, capturing and measuring these in student dialogue.

<u>Coding domain-specific reasoning</u>

Development of a coding framework to capture discipline-specific reasoning in primary English represents an important contribution of this project (see Sections 4.11 and 7.4). This coding tool operationalises the theoretical styles framework for primary English and permits measurement of these styles in student dialogue. Table 4.2 (Section 4.12.8) contains the three styles targeted in the empirical phase of the project. Descriptions of each code are provided alongside examples from data gathered here. Examples are ranked using SOLO (Biggs & Collis, 1982).

While rigorous and reliable coding instruments to measure dialogic teaching and learning are available (Hennessy et al., 2016; Vrikki et al., 2019) (see Section 4.12.5), these were not able to measure specific styles of reasoning and were therefore too general for the purposes of evaluating disciplinary-based reasoning. Section 2.6.4 also discusses the Protocol for Language Arts Teaching Observation (PLATO) tool, which, unlike the dialogic coding tools referenced above, is specifically targeted at the subject of English. Although PLATO is targeted at the same disciplinary area (English), it offers a more general and wide-reaching lens through which to observe and measure classroom instruction. While recognition of key practices important to effective instruction in English are reassuringly shared between PLATO and the project discussed here, PLATO is too general and is ultimately aimed at evaluating teacher practice, which differs from focus in this project. Brief commentary on existing coding frameworks therefore indicates the absence of an existing framework to consider discipline-specific reasoning. Development of such a framework in this project therefore represents a unique contribution to the field. The discipline-specific coding framework also provides a template for additional coding frameworks designed to capture discipline-specific reasoning practices specifically, and dialogic teaching and learning generally, in other subject domains. The coding framework developed here moves beyond theoretical discussion of sociocultural theory, CoP and particularly discipline-specific reasoning styles (among other theories), offering a tool to empirically capture and measure discipline-specific reasoning.

6.1.4   Conclusion

This section has considered a major finding of this project: that discipline-specific reasoning styles in primary English are realisable, operationalisable and measurable. This finding is consistent with much of sociocultural theory, CoP theory, cognitive history and specifically with reasoning styles theory. It extends existing consideration of reasoning as part of dialogic teaching and learning, to recognise the role of specific, disciplinary-based styles of reasoning. A specific tool has been developed to operationalise and code domain-specific reasoning styles part of the empirical investigation in this project. This represents a unique contribution to existing research. Discussion will now move to focus on the second major finding of this project: that proportions of reasoning styles appear to vary according to task structure used.

6.2   Key Finding Two: Variation in reasoning according to task structure

Section 5.2 reflects on variation in discipline-specific reasoning according to task structure used. Findings for the four main task structures used here were shared: diamond ranking, odd one out, fortune lines and role on the wall. Proportions of domain-specific reasoning were presented for each task to permit a tentative exploration of their potential to promote specific reasoning styles. Findings suggest that proportions of domain-specific reasoning do vary by task: diamond ranking and odd one out task structures saw larger proportions of domain-specific reasoning across the three targeted reasoning styles (at least 19% for diamond ranking when all CDAS codes are included in analysis, or at least 24% when the four cross-cutting codes are removed; at least 15% for odd one out when all codes are included, or at least 18% when the four overlapping codes are removed). Moreover, proportions of discipline-specific reasoning within each task varied according to the reasoning style promoted, perhaps suggesting that some tasks are more likely to promote particular reasoning styles than others (see Section 5.1 for discussion about which tasks led to greatest domain-specific reasoning within each reasoning style). Differences in proportions of discipline-specific reasoning according to reasoning style promoted were presented, with possible reasons for any lower proportions reflected upon (see Sections 5.1.1.3 and 5.1.2.3). Limitations are acknowledged. These relate to the number of instances tasks were used, the absence of some task structures to promote some reasoning styles and the limited sample (Section 5.2.5 and Conclusion).

Yet overall evidence indicates that proportions of discipline-specific reasoning appear to vary by task, with diamond ranking and odd one out structures tending to promote reasoning styles in primary English most readily.

Research literature on pedagogical task structure and tools is scarce. Because of this, the following section tends to draw on discussion of task structures as used by researchers rather than by teachers. Several issues will be discussed. The first section considers affordances shared by all four task structures used. Their overall potential is indicated by the average proportions of discipline-specific reasoning that each structure promoted. While some might have promoted higher proportions than others, all four can be considered useful to the promotion of discipline-specific reasoning to some extent. The second section tentatively considers specific features of the two task structures which can be considered most 'successful' at promoting domain-specific reasoning in this project (diamond ranking and odd one out).

6.2.1   'Affordances' of task structures used

Gibson first proposed the term 'affordance' defining it in terms of "what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill … It implies the complementarity of the animal and the environment" (1986, p. 127). Norman emphasises the importance of perception to the notion of affordance: "the term *affordance* refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used" (1988, p. 9). Its usage has been widespread but varied (Hartson, 2003, McGrenere and Ho, 2000, Oliver, 2005), with problems related to the notion of perception identified (Hammond, 2010; Michaels & Carello, 1981). Difficulties of translating theories used to explain animal behaviour to consider human societies have been recognised (Scarantino, 2003). Despite ontological tensions and problems related to the construct of perception and origins in animal behaviour, the term *affordances* is used here to relate to emergent properties of objects which can provide "both opportunity and constraint" (Hammond, 2010, p. 2) for users. Objects are represented here by task structures. These task structures have properties which can provide possible means of usage and engagement.

Consideration of discipline-specific reasoning and variation in proportions according to task structure used might profitably draw upon the two main metaphors for learning explored in this thesis (the acquisition and participation metaphors). As previously discussed, the main aim of this project is to develop students' capacity to reason according to disciplinary-established, disciplinary-required and discipline-specific practices. The role of dialogue in this endeavour has already been explored above (6.1.2). Task structures may also be considered as tools which can facilitate the process of learning to reason. It might be asked whether activities developed to promote specific reasoning styles supported students' capacity to participate in discipline-specific ways. Findings briefly presented in Section 6.1 and explored in detail in Chapter 5 suggest that these activities do support the promotion of discipline-specific reasoning. Drawing on the participation metaphor for learning, task structures employed in this project may encourage and require student participation in disciplinary-based practices.

Participation in disciplinary practices is also explored in other theories. The importance of thinking routines and habits in classrooms, supported by tools, is explored by Ritchhart and colleagues. Ritchhart (2002) found that teachers who successfully promoted students' thinking tended to scaffold and support this thinking by developing, adapting and using specific routines. Ritchhart, Church and Morrison (2011) conceptualise thinking routines in three ways: as tools, as structures and as patterns of behaviour. It is argued that teachers must identify the type of thinking they aim to elicit from students and select one thinking routine which represents the most appropriate 'tool' for that aim. The authors suggest that these thinking routines support the learner to develop growing awareness of their own thinking and are therefore valuable for students and teachers (Ritchhart, Church and Morrison, 2011). The thinking routines identified by Ritchhart, Church and Morrison also represent structures. It is suggested that the stages involved within the routines act as natural scaffolds supporting higher levels of thinking. Rather than representing individual items to complete, sequential steps within thinking routines build on and extend the thinking involved in the previous stage. The authors also argue that once students become familiar with the stages involved in the thinking routines, this awareness helps them to structure small group discussions. Ritchhart, Church and Morrison also view thinking routines as patterns of behaviour. They emphasise the importance of routines as contributing to and building classroom culture (Leinhardt, Weidman, & Hammond, 1987; Ritchhart, Palmer, Church, & Tishman, 2006; Ritchhart, 2002). They represent "socially shared, scripted slices of behaviour" (Ritchhart, Church, & Morrison, 2011, p. 48; Leinhardt & Steele, 2005; Yinger, 1979) which students use with increasing independence.

There are clear parallels between suggestions made by Ritchhart and colleagues and those explored in this thesis. The four task structures used here might represent examples of scaffolding tools supporting thinking routines. Consideration of task affordances might therefore profitably draw on Ritchhart and colleagues' concept. Moreover, explicit promotion of specific types of thinking links to targeting of reasoning styles in primary English. The use of tools to support the required thinking, with their sequential and scaffolding properties, clearly maps onto the present project's focus on scaffolding task structures. Furthermore, focus on patterns of behaviour in Ritchhart, Church and Morrison's (2011) book engages with ideas of disciplinary-based practices considered in this thesis. For example, the task structures used in this project can be applied across content areas, age groups, ability ranges and even the broader curriculum. By using these as part of classroom routines, students will become more familiar with the types of behaviour (reasoning practices for example) which routines (or task structures) demand.

Despite benefits of promoting thinking, reasoning, dialogue and collaboration (see Literature Review), research suggests that teachers often find selecting and designing appropriate tasks to promote collaborative work and dialogue challenging (Bennett & Dunne, 1992; Blatchford et al., 2003; Harwood, 1995). It has been argued that students only engage in dialogue of high-quality if they are specifically asked to provide reasons for and justify their conclusions (Chinn, O'Donnell, & Jinks, 2000; Muhonen, Rasku-Puttonen, Pakarinen, Poikkeus, & Lerkkanen, 2016). Several authors have focused specifically on task design, suggesting ways in which collaborative work and reasoning can be promoted. Leat and Higgins (2002) define and discuss the role of *powerful pedagogical strategies* (PPS) and Lotan (2014) provides conditions for *groupworthy* tasks. These are discussed in more depth in Section 2.7.5, but brief consideration of their shared focuses might illuminate possible reasons for observed benefits and variations between tasks used in this project.

Both Leat and Higgins' PPS and Lotan's conditions for groupworthy tasks emphasise the importance of tasks being open-ended: "requir[ing] complex problem-solving" (Lotan, 2014, p. 85) and "enourag[ing] a variety of working methods and reasoning" (Leat & Higgins, 2002, p. 75). These types of open-ended tasks are also termed *ill-structured* in research literature, and are identified as valuable to problem-solving, conceptual learning and productive group work (Cohen, 1994). All four task structures in this project are open-ended, which supported students in the process of learning to reason by requiring discussion and debate, carefully supported by reasoning. Moreover, both PPS and groupworthy tasks emphasise the importance of subject content knowledge. Leat and Higgins suggest that "subject knowledge…is extended from something to be mastered to become the

stimulus to reasoning" since PPS juxtapose "the known with the new" (2002, p. 76). Lotan similarly argues that groupworthy tasks "address discipline-based, intellectually important content" (2014, p. 85). While task structures used here are flexible enough to be applied across the curriculum (fulfilling another of Leat and Higgins' definitions of PPS), by specifically tailoring tasks to content from the primary English curriculum, students are encouraged to grapple with disciplinary-based content. Reasoning is therefore stimulated by the gap between prior knowledge and new scenarios or possibilities created by the task demands.

Leat and Higgins' (2002) PPS must also represent a manageable unit of change and be flexible and adaptable. In this project, tasks were used in single lessons. While some task structures were used with different content and to target different styles of reasoning, they were simple enough to be introduced and used within a single lesson (thus representing a manageable unit of change) but were also adaptable and flexible enough to be used with different content from the broad subject of English and with different age groups (across KS2).

Lotan additionally suggests that groupworthy tasks "require positive interdependence and individual accountability" (2014, p. 85). This links to discussion about the importance of collaboration and collaborative learning in Section 2.7.2. It also draws parallels to concepts explored in the previous section such as sociocultural theory, CoP theory and dialogic teaching and learning. In addition, there is a clear link between Lotan's emphasis on positive interdependence and the participation metaphor explored throughout this thesis. The nature and structure of tasks considered *groupworthy,* or as *PPS*, seem to foreground working in ways considered desirable to the development of collaborative, dialogic ways of learning which support the process of learning to reason. Leat and Higgins' requirement that PPS "encourage talk" is particularly resonant to task use in this project; given the likely ambiguity of tasks, "they present information in a way that demands interpretation, clarification, connecting, hypothesizing and evaluating, which are the kinds of talk that are prized for their role in helping pupils jointly construct understanding" (2002, p. 76). This draws obvious parallels to discussion of dialogue and dialogic teaching and learning discussed previously (Section 6.1.2) and to the focus on development of reasoning in this project.

Leat and Higgins (2002) also suggest that PPS can support metacognitive awareness by requiring cognitive and social processes which can then be discussed in class. This links to Lotan's requirement that tasks "include clear criteria for the evaluation of the group's product and of the individual report" (2014, p. 85). Because these task structures accommodate a variety of responses and

approaches, they provide ample opportunity to engage in whole-class discussion. This may be enhanced further by engaging with the framework of reasoning styles in this project. Such styles can be modelled, discussed, and compared, with support from task structures. Use of reasoning styles also provides the evaluation criteria Lotan mentions; by engaging in talk about cognitive and social processes involved in reasoning according to different styles in primary English, students develop metacognitive awareness and can learn to evaluate their use of particular styles. The open-ended, flexible structure of tasks used in this study, which engage with subject content, are therefore important to creating optimum conditions for engagement with disciplinary-based reasoning. They require students to *participate* in disciplinary-based practices.

A further aspect applicable to all four task structures and considered beneficial to the promotion of collaborative working and participation rests on the visual nature of tasks. It is suggested that use of visual activities supports participation and is particularly encouraging to those who might be challenged by tasks requiring high levels of proficiency in reading and writing (Clark, Laing, Tiplady, & Woolner, 2013; Moss, Deppeler, Astley, & Pattison, 2007; Niemi, Kumpulainen, & Lipponen, 2015). All four task structures involve a highly visual component. Diamond ranking involves a diamond-shaped structure with spaces to place ranked items; fortune lines requires completion of a graph with consideration of x and y axes; odd one out can be presented in a triangle format or as a target board; and role on the wall presents an outline of a figure with space to record both inside and outside. This aspect is considered with reference to odd one out and diamond ranking in the following section.

The four task structures used here comply with principles of good task design outlined by Leat and Higgins (2002) and Lotan (2014), and all four can be considered ill-structured and visual. They all promoted discipline-specific reasoning, although findings indicate that two task structures were most likely to promote higher proportions of discipline-specific reasoning. Discussion will now consider affordances of diamond ranking and odd one out.

6.2.2   Affordances of Diamond Ranking and Odd One Out

This project is small-scale and has some limitations relating to sampling of the different task structures across reasoning styles. Nevertheless, findings tentatively suggest that two tasks

(diamond ranking and odd one out) seem most adaptable to the three reasoning styles targeted in the study and most likely to promote disciplinary-based reasoning. This section will speculate on possible reasons for the relative advantage of these two task structures, linking discussion to literature on task design.

Diamond ranking is described in Section 4.13.4. Nine boxes are organised in a diamond layout. Items are provided (usually statements, but also sometimes photographs, see e.g. Niemi (2015), or objects) which must be 'ranked'. Ranking can be according to importance or interest (Clark, 2012). Like the other three task structures used in this study, diamond ranking is believed to represent a useful stimulus for discussion and debate (Clark, 2012; Niemi et al., 2015; Rockett & Percival, 2002; Woolner et al., 2010) and has been identified as a thinking skills tool (Rockett & Percival, 2002) offering a "dynamic" element to research (Clark, 2012, p. 224). Its motivational benefits have been identified (Baumfield et al., 2013; Niemi et al., 2015). As may be the case for all four task structures, the unusual format of diamond ranking may increase the likely response rate and the authenticity of answers provided by those engaging in the activity (Baumfield et al., 2013). While literature promoting the use of diamond ranking is available (and cited here), this typically considers diamond ranking as a research tool, often designed to capture participant views on a topic. While also used as part of research here, the focus differs in that its utility as a classroom pedagogical tool is considered. (For pedagogical texts discussing the use of diamond ranking, see for example: Brown, 2009; Brown & Fairbrass, 2009; Clough & Holden, 2002; Rockett & Percival, 2002).

Odd one out and its variations are described in Section 4.13.1. This task requires selection of an item (or group of items) which can be considered 'odd'. Commonly presented in a triangle format (Higgins, 2001), odd one out typically presents three 'items' (in English, these might be characters, texts, genres or settings). Those engaging in the task decide which of the three is 'odd' based on some distinguishing feature. In addition, the similarity linking the two remaining items must also be articulated. This activity structure requires skills of classification and sorting (also identified as thinking skills, e.g. Higgins, 2001). Students must consider similarities and differences, formulating and reflecting on the rules guiding decisions about which items to group and which to label as 'odd'. Given that the task is open-ended (like the other three used in this project and in accordance with criteria for group tasks articulated by Lotan (2014) and Leat and Higgins (2002)), students are also encouraged to identify and reflect on alternative solutions, justifying the basis of these possibilities. To extend student thinking within odd one out, they can be asked to identify additional items

belonging to the 'similar' group. This encourages engagement with principles and structures underpinning their groupings.

General criteria for effective, *groupworthy* tasks (Lotan, 2014) or *powerful pedagogical strategies* (Leat & Higgins, 2002) were discussed in the previous section. All four task structures used in this project aimed to meet such requirements. Diamond ranking and odd one out tasks in this study tended to promote higher proportions of domain-specific reasoning and seemed most adaptable to targeting the three reasoning styles explored. Possible reasons for their greater 'success' in terms of promoting reasoning styles in English will now be explored.

Both diamond ranking and odd one out require elicitation of constructs and demand an explicit decision. Those engaging with these tasks (in this study, students) must articulate over-arching relationships supporting their organisation of ideas (in terms of ranking decisions or categorising into 'similar' or 'odd' conditions) (Clark, 2012). Since there is no 'correct' solution in diamond ranking or odd one out tasks, and given that activities are often tackled in pairs or small groups, students must discuss, negotiate, debate, reason, argue, accommodate, reflect, compromise and seek consensus to varying degrees. By providing reasons and justifications for decisions about where to place items in a diamond or which to label as 'odd', students' understandings become available for scrutiny, evaluation and comparison (Clark, 2012). These tasks therefore require that justification and reasoning be sound enough to 'pass' judgements made within the group. Decision-making and justification are not such strong requirements in either role on the wall or fortune lines. Role on the wall is inclusive of a range of ideas; characteristics for both inner and outer portions can be included providing a reason for inclusion is articulated. This task does not require the same type of constrained decision-making as in either diamond ranking or odd one out. Moreover, although fortune lines requires decisions about where to place events within a graphical format, these decisions are based on a scale; variation in student ideas is mainly based on placement of events within this scale. Like role on the wall, fortune lines does not require a polarised decision (like which of three items is 'odd' or which is most 'important'). Fortune lines and role on the wall might be considered more 'inclusive', permitting incorporation of a range of ideas without 'forcing' decisions (and therefore justifications) to the same extent as in diamond ranking and odd one out. Hopkins describes the diamond as "forc[ing] sacrifices and prioritization"(2010, p. 48). In both diamond ranking and odd one out, clear and explicit reasoning is encouraged so that all decisions are justified

and agreed upon by group members. Constraints of the two task structures (in terms of requiring explicit decision-making) may therefore be beneficial to the promotion of reasoning.

A further affordance of both diamond ranking and odd one out relates to their spatial and visual nature. Clark (2012) suggests that the process of arranging items (in her study, photographs) within the diamond assisted individual participants in their thinking. She also argues that arranging items while discussing the content of individual items was an important part in the process of reaching agreement which therefore also supported pairs. The visual aspect of diamond ranking may therefore scaffold cognitive task requirements. These benefits might also apply to the visual and spatial nature of the odd one out task structure, where students can move the three items within the triangle so that two are grouped, and one is 'odd'. Scaffolding support provided by the visual structure of tasks seems to have been beneficial in the present study, illustrated in the following exchange from a GRE diamond ranking activity:

> Student 2: I think ['marriage'] should be slightly, like higher up… Like because, like, if people are falling in love, like it can make a difference because... in Cinderella, if Cinderella didn't love the prince or the prince didn't love Cinderella, then like...
>
> Student 1: She would have lived a normal, miserable life.
>
> Student 2: And they wouldn't have danced at the ball and everything, so like that can be like, it can change the whole story.

The requirement to physically arrange features of the fairy tale genre seemed to prompt explicit reasoning from students.

Clark (2012) discusses the middle portion of the diamond, likening it to a "neutral", "undecided" or "middle-value", similar to that used in the Likert (1932) psychometric scale often used in questionnaires. It is suggested that justifications about choices around the middle portion of the diamond may be weaker than those for items placed at the top or bottom. However, in this study, the middle portions, where several items are ranked 'equally', prompted some careful discipline-specific reasoning from students. For example, the group supported by me (researcher-supported condition) at School B completed a diamond ranking task designed to promote GRE. Features of fairy tales were ranked according to their importance to the genre. Students involved in the task placed 'hero' and 'villain' alongside one another arguing: "if there wasn't a hero...the villain wouldn't be stopped". This example suggests potential affordances of the diamond structure where equivalent

positions may be beneficial to the reasoning process. Unique requirements of the diamond may therefore help to explain why it seemed to promote discipline-specific reasoning most readily and flexibly across the three styles in this project.

In addition to scaffolding thinking, the visual nature of diamond ranking and odd one out also promotes inclusivity (Clark, 2012). Barriers which tasks relying on high levels of reading and writing proficiency might impose are removed and responses from a greater variety of participants might be encouraged. It was hoped in Clark's diamond ranking study that use of a visual tool would "enable the inclusive participation of a diverse group of teachers, students, support staff and community members" (2012, p. 231). While used only with students in the present study, both diamond ranking and odd one out were used across KS2 (ages 7-11), with students of varying abilities (including those identified as having special educational needs and disabilities). Therefore, the 'success' of these task structures at promoting discipline-specific reasoning might also be partially explained by their accessibility to a range of students, with limited reliance on written skills. Although similar arguments might be made for fortune lines and role on the wall, more reading is usually required in fortune lines and more writing is needed in role on the wall. They may therefore be less inclusive than diamond ranking and odd one out.

Despite limited writing demands, it is suggested that annotating can consolidate use of diamond ranking as a discussion tool (Clark, 2012; Niemi et al., 2015; Woolner et al., 2010). Written annotations can articulate justifications made for decisions about where to place items in the diamond. In this project, diamond ranking tasks did not typically require students to annotate their diamonds, yet odd one out tasks presented in the triangle format usually encouraged student annotation. Noting shared similarities along the line of the triangle connecting the two grouped items helps to make clear the basis on which these two have been classified as 'similar'. Recording distinctive element(s) of the item regarded as 'odd' adds to this justification. There is also space to consider alternative solutions to odd one out tasks, with space to record numerous similarities and differences. This can help students to decide which of their justifications is strongest. Annotations might be useful in a classroom context where dialogue cannot usually be audio-recorded or transcribed. It might support students to make the bridge from verbal disciplinary-based reasoning, to written disciplinary-based reasoning. Although annotations were not always required from students in this project and were not subject to analysis, use of annotation might represent a profitable focus of future research into the utility of pedagogical tools/structures.

Consideration of the affordances of diamond ranking and odd one out (compared to fortune lines and role on the wall) is largely speculative and tentative, although arguments are supported with reference to literature. The need to make explicit, polarised decisions because of constraints within diamond ranking and odd one out formats requires an increased level of justification and reasoning from students. This meets the requirement articulated by Chinn, O'Donnell and Jinks (2000) that students will only participate in high-quality dialogue when they are specifically requested to provide reasons and justifications for their decisions/conclusions. The visual, spatial and inclusive nature of the tasks enhance their accessibility and may support students in their thinking and organisation of ideas. Future inquiry might profitably explore these task structures further in terms of their capacity to promote discipline-specific reasoning in primary English (and perhaps in other curriculum subjects).

6.2.3   Conclusion

This section has explored the project's second main finding, that proportions of domain-specific reasoning appear to vary according to task structure used. Literature on task design and requirements for effective group work has been considered alongside the project's empirical findings. Much of this literature considers task structures as used in research or offers more general pedagogical suggestions based on limited empirical underpinning. Because of the lack of research into task design and structure, future research might profitably explore this area. Affordances and constraints of the four task structures used in this study were considered before the two structures observing greater proportions of discipline-specific reasoning were reflected on in more depth. Possible reasons for higher proportions in diamond ranking and odd one out tasks were offered.

Sections 6.1 and 6.2 consider the first two main findings of this project: that discipline-specific reasoning styles in primary English are realisable in practice and can be operationalised and measured; and that proportions of discipline-specific reasoning are likely to vary according to task structure used. The third main finding will be considered next: that proportions of discipline-specific reasoning tend to vary according to presence or absence of adult support.

6.3 Key Finding Three: Variation in reasoning according to presence of adult support

Section 5.3 presented evidence related to variation in discipline-specific reasoning proportions between the two main comparison groups used throughout the study: groups working independently, and groups supported by me (researcher-supported). It was expected that groups working with me would be supported and guided to demonstrate higher proportions of domain-specific reasoning than groups working independently. However, if such styles are realisable in the primary classroom, and if selected task structures help to promote discipline-specific reasoning, it would be expected that independent groups should also demonstrate domain-specific reasoning, even to a lesser extent. Findings presented broadly confirmed these expectations, although there was some variation across reasoning styles and task structures. Findings are available for eight lessons with both a researcher-supported group and an independent group. In half of these (4), the researcher-supported group demonstrated a higher proportion of domain-specific reasoning. In two tasks, proportions are equal between researcher-supported and independent groups. Interestingly, in two tasks, proportions of domain-specific reasoning were higher in the independent group.

Considering my role (as researcher) in promoting discipline-specific reasoning might usefully return to the participation metaphor for learning. I might have provided the support required to enable enhanced levels of student participation in discipline-specific reasoning practices. The role of dialogue in enhancing such participation is explored in the first section of this chapter (6.1). In addition, the role of task structures in facilitating participation and the process of learning to reason is explored in Section 6.2. The presence of adult support within a group may also influence both the level and nature of participation from students. It is useful to consider whether the presence of adult support supported students' capacity to participate in discipline-specific ways. Findings briefly presented above and explored in detail in the Results and Analysis chapter suggest that support from me played a role in the promotion of discipline-specific reasoning and usually led to higher proportions. According to the participation metaphor, it is possible that the supporting adult was able to encourage and model participation in disciplinary-based practices.

For findings in this project to be of practical value in the primary classroom, it is important to translate key messages emerging from the data into tentative recommendations for classroom

practice, in conjunction with existing literature. Thus, while higher levels of domain-specific reasoning observed in researcher-supported groups may not apply to all types of adult-support, it is possible to consider ways in which this support might have promoted higher proportions of domain-specific reasoning. This may support teachers wishing to promote disciplinary-based reasoning practices in their own classes and aiming to improve collaborative, dialogic group work in their lessons. The following sections will therefore consider the roles of scaffolding and teacher modelling.

6.3.1   The role of the teacher

It has been suggested that students engage in high quality dialogue only when asked to provide reasons and justifications for their arguments (Chinn, O'Donnell & Jinks, 2000). The roles of dialogue and task demands in promoting disciplinary-specific reasoning are explored in the previous sections. Adult presence also seems to make a difference. This section will consider the teacher's role in terms of modelling and scaffolding.

Webb, Nemer and Ing's (2006) study (see also Literature Review) identified a strong link between the types of interaction demonstrated by teachers and interaction demonstrated by students in collaborative group settings. The Thinking Together intervention studies (Mercer, 2013; Mercer & Littleton, 2007), involving more than 700 children aged between 6 and 14, required teachers to model *exploratory talk* during whole-class sessions. One Thinking Together study, involving children aged 9 and 10, found that those students who had participated in the Thinking Together intervention not only gained higher scores in science and mathematics National Curriculum-based tests, but also became significantly better at reasoning (assessed using the Raven's Progressive Matrices test), both collectively and individually (Mercer, Dawes, Wegerif, & Sams, 2004; see also Rojas-Drummond & Mercer, 2003, for replicated findings in Mexican schools). In the present study, reasoning invitations represent a specific dialogue move which promote engagement in reasoning (by specifically asking for it). Invitations came from me (partially explaining the increased likelihood of domain-specific reasoning in the researcher-supported condition), but students also invited reasoning. It is possible that my invitations modelled this dialogic function for students. These invitations may have increased the likelihood of students engaging in reasoning practices. This suggests that teachers play an important role in supporting and developing children's thinking and

promoting more active participation in reasoning practices (Muhonen et al., 2016). Furthermore, it has been suggested that, partially through appropriate modelling, teachers can scaffold students' intramental development; teachers can support student internalisation of social (intermental) learning (Mercer, 2013). While the present study does not require that discipline-specific reasoning processes are internalised by students and does not seek to measure or evaluate whether this has happened, teacher modelling seems to play a role in promoting student participation in discipline-specific reasoning.

Scaffolding is explored in Section 2.7.4. The teacher's role in scaffolding learning is made clear in key theories of learning and development (Bruner, 1978; Vygotsky, 1978; Wood et al., 1976) and is supported in empirical research (Mercer, 2013; Mercer & Littleton, 2007; Webb et al., 2006). Drawing on Vygotsky's (1978) zone of proximal development (ZPD), scaffolding sees a teacher, or more experienced peer, supporting a child in their learning through, for example, modelling or questioning.

Van de Pol, Voman and Beishuizen's (2010) review identifies three common characteristics taken from numerous definitions of scaffolding and contained in their own definition: contingency (the teacher adapts their level and/or type of support according to individual (or group) need(s); fading (the teacher gradually withdraws their support); and transfer of responsibility (responsibility for task performance gradually transfers to the student (or group of students)). These three characteristics provide a useful means of evaluating the scaffolding offered by teachers. The importance of questioning, and particularly the quality of teachers' questions, is also identified as critical in supporting students' participation (Gillies, 2013; King, 2002; Muhonen et al., 2016). Moreover, the role of active listening, allowing teachers to effectively summarise interactions, is also identified (Muhonen et al., 2016). It has been suggested, perhaps unsurprisingly, that teachers who convey respect for student contributions through careful listening, demonstration of interest and posing of questions, may find that students are more willing to contribute and to participate (Hännikäinen & Rasku-Puttonen, 2010; Muhonen et al., 2016). In this project, careful listening, appropriate responses and questioning from an adult may have made students more willing to participate in discipline-specific reasoning practices.

There is extensive literature on scaffolding and the various scaffolding strategies teachers might use (see e.g. Van de Pol, Voman & Beishuizen, 2010; Muhonen, Rasku-Puttonen, Pakarinen, Poikkeus, & Lerkkanen, 2016). Considering scaffolding as part of dialogic teaching might be a useful lens through which findings from this study can be considered. The teacher's role in facilitating student engagement in dialogic practices has been identified (Alexander, 2008; Mercer & Littleton, 2007). Teachers can model and provide opportunities for students to ask questions, evaluate ideas, negotiate and reason (Muhonen et al., 2016). Together, through scaffolded dialogue, it has been argued that participants become able to have thoughts they could not have had on their own, yet they are able to recognise these thoughts as developments of their own thinking (Game & Metcalfe, 2009). Thus, rather than representing stepping stones towards the teacher's end-goal, fixed end-point or answer, scaffolding in dialogic interactions "involves supporting [students] to venture deeper in their thinking and to consider different points of views" (Muhonen et al., 2016, p. 152). This is reinforced by King's argument, underpinned with reference to literature, that "thoughtful" peer interaction, namely, high-level thinking and interaction which "generates thought-provoking questions, explanations, speculations, justifications, inferences, hypotheses, and conclusions" (2002, p. 34), does not occur spontaneously (Pressley, McDaniel, Turnure, Wood, & Ahmad, 1987; Vedder, 1985; Webb, Ender, & Lewis, 1986). King (2002) therefore argues that teachers should intervene to structure group work, to explicitly guide students in their interactions and to focus on the learning process rather than getting the 'right' answer. One way in which a teacher can intervene is through their careful selection of task structures (see section above), but teachers can also provide guidance through appropriate modelling of reasoning practices.

6.3.2   Conclusion

Overall, comparisons between group types across reasoning styles and task structures broadly suggest that those in a group supported by an adult are more likely to demonstrate a higher proportion of discipline-specific reasoning than those working independently. The third main finding from this study therefore suggests that the proportion of domain-specific reasoning is likely to vary according to the presence or absence of adult support. This has been considered alongside notions of scaffolding, modelling and the role of the teacher, which might provide possible reasons for the increased likelihood of domain-specific reasoning in groups supported by an adult. These considerations may support teachers who wish to enhance students' domain-specific reasoning.

6.4 Conclusion

This chapter has explored three main findings emerging from data gathered in this project. The first section explored the project's main finding: that reasoning styles identified for primary English are realisable in student dialogue, operationalisable and measurable. This finding is considered in conjunction with metaphors for learning, sociocultural theory, CoP theory, cognitive history and reasoning 'styles' literature. Findings in the empirical phase of the project are largely consistent with major claims from the theories and research indicated above. Previous consideration of dialogic teaching and learning is extended in this project to recognise the role of specific, disciplinary-based styles of reasoning.

The second section explored the project's second main finding: that proportions of discipline-specific reasoning appear to vary according to task structure used. This section engaged with literature on task design and requirements for effective collaborative group tasks. Affordances and constraints of the four task structures used in this study were considered. Particular affordances of the two structures which observed greater proportions of discipline-specific reasoning (diamond ranking and odd one out) were reflected on. Possible reasons for higher proportions were posed, with reference to research and pedagogical literature, although discussion was speculative.

The third section explored the project's third main finding: that proportions of discipline-specific reasoning appear to vary according to the presence or absence of adult support. Again, the participation metaphor for learning was drawn upon when considering this finding. Literature on teacher modelling and scaffolding was presented which might help to illuminate the likelihood of enhanced levels of domain-specific reasoning in groups supported by an adult. These considerations may support teachers who wish to enhance levels of domain-specific reasoning in their own classes, through careful reflection on their role.

The final chapter of this thesis will offer concluding messages. Limitations of the study will be reflected upon and possible directions for future research will be considered.

7 Conclusion

7.1 Research aims and motivations

An underlying aim of this research was to stimulate improved teaching of reasoning in primary English lessons, by making aspects of it more explicit. This goal was partly influenced by my experiences as a primary school teacher, where reasoning outside of mathematics and science was rarely reflected upon in my training and classroom experience. I also wanted to find ways to support students to learn to justify inferences made when reading texts (and, albeit to a lesser extent, their decisions when writing). Yet ways to support the process of learning to reason in English were not explicitly considered or addressed in my experience, for instance, through CPD or school policy documents, or in National Curriculum materials.

Two main RQs guided this project:

RQ 1: What styles of reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum?

RQ 2: Can relevant reasoning in English literature be realised in scaffolding tasks for use in primary English teaching?

These questions required different approaches. The first question led to a conceptual enquiry phase (detailed in Study One) which resulted in the creation of a framework of reasoning styles to be explored empirically in Study Two. Study Two developed activities designed to promote student engagement with targeted reasoning styles. Student dialogue was audio recorded and transcribed, before being coded using an adapted version of the Cambridge Dialogue Analysis Scheme (CDAS) (Vrikki, Wheatley, Howe, Hennessy, & Mercer, 2018). Findings suggest that the three targeted reasoning styles are realisable in the primary classroom: they can be promoted, operationalised, captured and measured. Moreover, proportions of domain-specific reasoning are likely to vary according to task structure used, with diamond ranking and odd one out activities promoting the highest proportions in this study. In addition, proportions of discipline-specific reasoning are likely to vary according to the presence or absence of adult support, with those receiving support often (although not always) demonstrating greater proportions.

7.2 Limitations of the study

Several limitations of this study are identified and reflected upon in Section 4.14. These are based mainly on the exploratory and small-scale nature of the study, the opportunistic sampling strategy and the use of a single researcher. Consideration is given to potential forms of bias within observation research and ways in which these were mitigated in this study are shared. Despite careful reflection on limitations associated with the design of the research, some additional limitations emerged during the course of data collection. These will be discussed below.

7.2.1 Issues within data collection

Firstly, the decision to exclude two of the reasoning styles contained within the framework of styles developed in Study One (structural and contextual) limits confidence in the framework in its entirety. Confidence might have been gained through empirical investigation. Thus, any claims about discipline-specific reasoning are necessarily limited to the three styles selected for empirical investigation. Nevertheless, the decision to focus on three styles was necessary within the scope of the project and selection was justified in Section 4.6.

Another potential issue is that not all task structures were used to target every reasoning style (although GRE used every task structure, there was no independent group recording for one of the tasks because of technical issues discussed below). The task structures to be used evolved within the project, as a result of careful evaluation of affordances and constraints and throughout the piloting process. It was decided that each reasoning style would be targeted using at least three different task structures. This was for reasons of manageability and because the primary focus was on the promotion of reasoning styles. Consideration of task structure was secondary to this focus. Nevertheless, it is more difficult to consider task-specific affordances and constraints fully when they have not all been used for each reasoning style. The potential of task structures not used (or less successful than others at promoting domain-specific reasoning in the data from this study) are reflected upon in Section 5.1. The Discussion chapter also offers task-based considerations.

A further limitation within data collection is the absence of independent group recordings on two occasions. Unfortunately, due to technical recording issues, there is no recording for an independent group in one GRE task and one ARE task. There are still three tasks for GRE and two tasks for ARE which have data for both an independent and a researcher-supported group. While there were always at least two recording devices used for each group, unfortunately, human error meant that recordings were not obtained for independent groups on the two occasions mentioned above. While it may have been possible to re-do (and thus re-record) the activity with an independent group, this would have been artificial since students would be essentially repeating a previous discussion or at least attempting a task that they had already participated in. The absence of independent groups on these two occasions is discussed in Section 5.3. Moreover, all conclusions about the influence of adult support are presented tentatively, in line with the exploratory intentions of this project and according to design limitations which prevent confident causal or correlational claims.

7.2.2   Conclusion

Reflection on potential limitations of this study demonstrates that problems have been considered carefully and taken seriously. Throughout the project, decisions and compromises made were carefully considered in terms of implications (particularly to research outcomes). While steps to mediate limitations have been taken wherever possible, it is important to emphasise that this study was exploratory. This does not mean that there was not concern for rigour and robustness throughout. While measures to ensure confidence in the project's findings have been taken, ultimately, findings and conclusions are presented as indicative, rather than conclusive.

7.3   Main findings

As discussed in the Results and Discussion chapters, three main messages can be taken from findings of this study. Firstly, at least three of the reasoning styles for primary English, described in the theoretical framework created in Study One, are realisable in the primary classroom (GRE, ARE and LRE). These three reasoning styles have been targeted and empirically captured in the dialogue of primary-aged children, who are at an early stage on the path towards disciplinary accomplishment. Secondly, proportions of domain-specific reasoning appear to vary according to task structure used.

Diamond ranking and odd one out structures seem particularly promising to the promotion of domain-specific reasoning. Thirdly, proportions of domain-specific reasoning appear to vary according to the presence or absence of adult support in groups. Broadly speaking, having adult support seems to increase the likelihood that students will engage in domain-specific reasoning in English. These messages are presented and supported with empirical findings in the Results and Analysis chapter and are critically examined and located within existing literature in the Discussion chapter. The next section will consider contributions that this research makes.

7.4   Contributions

This project makes several important contributions. Creation of a theoretical framework of reasoning styles and subsequent empirical exploration of this framework represent important contributions to existing research. Findings exploring variation in proportions of domain-specific reasoning according to task structure employed and presence or absence of adult support represent further theoretical contributions. This study also makes important methodological contributions. Development of a coding framework which operationalises and is able to capture domain-specific reasoning in English represents a unique extension of an existing framework designed to capture and measure educationally productive dialogue. It also provides a template for the development of coding instruments to measure domain-specific reasoning in other disciplines. In addition to theoretical and methodological contributions, this study may also contribute to developments in classroom practice. Reasoning is conceptualised specifically for the subject of primary English, providing examples of how this reasoning might manifest. The study engages with pedagogical task structures, critically reflecting on their utility and value in promoting dialogic, collaborative learning generally, and reasoning specifically. The study therefore contributes to an understanding of what reasoning in primary English looks like, exploring ways in which the process of learning to reason can be supported. The next sections will explore these contributions in greater depth.

7.4.1   Theoretical contributions

Drawing on sociocultural theory, it is argued that academic domains have developed particular styles of reasoning to draw conclusions and to judge those made by others (Bueno, 2012; Crombie, 1995; Hacking, 1992, 2012; Kind & Osborne, 2017; van Drie & van Boxtel, 2008). Calls to look towards the

culture of interest when describing prevalent reasoning styles have been made (Carrithers et al., 1990; Hacking, 1982; Roth, 1987; Taylor, 1982; Ziman, 1978), with advances in this effort already made in science (Crombie, 1995; Hacking, 2012) and history (van Drie & van Boxtel, 2008). This study therefore contributes to existing research by describing a theoretical framework of reasoning styles for English. Creation of this framework was guided by clear criteria which enabled critical evaluation of reasoning practices demonstrated in the fields of English literature and primary English. This analysis supported the construction of a framework of reasoning styles which have academic and theoretical support, are applicable to Primary English, demonstrate internal coherence and can be communicated with schools and teachers (see Section 3.3). The framework of reasoning styles for primary English address the project's first research question: what styles of cultural reasoning predominate in the academic domain of English literature and have most relevance for the primary English curriculum? Creation of this framework therefore represents an important theoretical contribution to existing literature focusing on the concept of domain-specific reasoning styles.

Although creating a theoretical framework of reasoning styles for English represents a contribution in itself, this project is primarily focused on the utility of such a framework to schools and education researchers. This pragmatic focus required that styles identified must also be realisable in the primary classroom. Section 5.1 presents findings which suggest that domain-specific reasoning styles for English, described in Study One, can be realised in English lessons in primary schools. Findings indicate that students participating in collaborative activities involved in this study spent, on average, one fifth of the total discussion engaging in discipline-specific reasoning (see Section 5.1.4). This is in addition to any general reasoning observed. The overall finding therefore, based on evidence presented, is that (at least three) reasoning styles in primary English can be promoted, captured, operationalised and measured (the remaining two styles not selected for empirical investigation should form the basis of future research (see Section 7.5.1)). These findings add to existing research related to the concept of domain-specific reasoning styles and extend this to apply specifically to primary English. Findings demonstrate the possibility of scaffolding, promoting and realising domain-specific reasoning in the primary English classroom.

7.4.2   Methodological contributions

In addition to theoretical contributions, this project also contributes to methodological literature related to domain-specific reasoning, particularly in terms of capturing and measuring such

reasoning for English. While reliable and robust coding instruments to measure dialogic teaching and learning are available (Hennessy et al., 2016; Vrikki et al., 2019) (Section 4.12.5), these are not able to measure specific styles of reasoning and are therefore too general for the purposes of evaluating disciplinary-based reasoning. Development of a coding framework designed to capture discipline-specific reasoning in primary English therefore represents an important contribution to existing research (see Section 4.12). This coding tool demonstrates the operationalisable nature of the theoretical styles framework for primary English and permits measurement of these styles in student dialogue.

To create domain-specific reasoning codes to supplement the general reasoning code in CDAS (Vrikki et al., 2019), the three reasoning styles subject to empirical investigation here (GRE, ARE and LRE) were carefully delineated and defined. The format used within CDAS (Vrikki et al., 2019) was followed, with similar levels of description and detail given within each additional code. To extend the coding framework further, and to support its accurate application, student examples of engagement with these styles of reasoning were taken from transcript data and included. Examples were ranked using SOLO (Biggs & Collis, 1982), which assesses the level of relational understanding demonstrated. The coding instrument therefore operationalises ideas developed in the reasoning styles framework for primary English. In this project, operationalisation was be tested by me and by the project supervisor to ensure reliability in coding. Beyond this research, progression indicators provided by ranked examples within the coding instrument might be tested on data in future research. Identifying indicators of progression within each style also supports teachers to introduce and pitch their teaching of reasoning gradually and progressively. Using the coding framework, teachers will be in a stronger position to be able to identify the level of relational understanding exhibited by their students, as well as to judge whether students are able to reason according to specific styles. Although further exploration of progression within individual reasoning styles was not possible, offering ranked examples in the coding framework will support teachers and future research.

7.4.3   Contributions to classroom practice

In addition to theoretical and methodological contributions, this project also contributes to classroom practice. Since reasoning styles for primary English can be reliably identified and coded,

and because tasks developed in this project promoted high proportions of reasoning, there is a strong argument for explicitly focusing on teaching these styles within primary education. The comprehensive framework of reasoning styles (Section 3.2) clearly describes each style of disciplinary-based reasoning identified for English. Reasoning styles are also considered alongside National Curriculum documents and end of KS2 assessment materials which demonstrates how individual styles complement current curricula requirements.

As well as supporting teachers to understand ways in which reasoning in primary English might manifest, the project also contributes to classroom practice by explicitly reflecting on task structures which can be used to promote domain-specific reasoning. The four task structures used are described and reflected upon generally in Section 4.13. Empirical findings related to task structure are presented in Section 5.2 and are critically considered alongside existing literature in the Discussion chapter. Affordances and constraints of each of the task types are considered (Section 6.2). All four structures support the promotion of dialogic and collaborative working which represents a challenge for many teachers. In addition, discussion about individual task structures, linked to specific reasoning styles, will support teachers to plan activities designed to promote domain-specific reasoning in primary English. These task structures are open-ended and flexible. They were all adapted on multiple occasions in this project to suit the text studied, learning objectives, curriculum goals, age and ability of students, and preferences of teachers. Although findings in this exploratory study are presented tentatively, teachers will nevertheless be guided to reflect on task-based features when planning student learning and development. They have illustrative templates for promoting domain-specific reasoning from which to build in future practice.

This project also contributes to classroom practice by reflecting on the role played by adults in the promotion of reasoning. The Results and Analysis and Discussion chapters reflect on data comparing findings related to domain-specific reasoning for groups working with me (as both researcher and experienced primary school teacher) and those working independently. Overall, comparisons between group types across reasoning styles and task structures provide tentative support for the expectation that those in a group supported by an adult are more likely to demonstrate a higher proportion of domain-specific reasoning than those working independently. Nevertheless, groups working independently still demonstrated discipline-specific reasoning, and reasoning in general was greater than might be expected in standard groupwork activities (see Section 6.1.2 for comparison

with Vrikki et al.'s data (2019)). The Literature Review also explores the role of the teacher, particularly in fostering collaborative ways of working. Such discussion alongside empirical findings may support further exploration and consideration of the teacher's role in promoting reasoning development.

7.5   Future research

This project paves the way for future research in several directions. In the same way that contributions in the previous section were considered according to their theoretical, methodological, or pedagogical basis, potential future research is grouped similarly.

7.5.1   Theoretical Directions

Developments to existing theory might be achieved in several ways. This section will discuss possibilities of validation, replication, and development of the reasoning styles framework.

It would be useful if future research aimed to replicate this exploratory study on a larger scale. Confidence in claims could be strengthened by recruiting additional schools and teachers. They could follow the reasoning styles framework created in Study One and use the same task structures. Additional, more wide-ranging data could add to that gathered in this project and would be useful for validation purposes. This might help to clarify conclusions, or modify the tentative arguments expressed here. It would help to enhance the generalisability of findings (should similar patterns be observed).

To further enhance confidence in claims after a process of validation and replication, additional schools could be recruited using random sampling strategies. An experimental design would permit the establishment of causal findings and claims. The sample of schools (clusters) could be randomly

allocated to receive the reasoning styles intervention or to be in a control condition. This would permit researchers to assess whether using the scaffolding tasks to promote domain-specific reasoning improves proportions of both general and domain-specific reasoning, compared to normal practice. Inferential statistical methods could be applied to consider whether findings might extend beyond the immediate data collected. This exploratory research therefore represents a "hypothesis-generating" study. Preliminary findings might be developed by conducting a larger-scale study (Cohen et al., 2018, p. 850; Cooper, 1998; Cooper & Dunne, 2000).

In addition to replication and validation research, future investigation might develop the concept of reasoning styles. Because most areas of investigation developed in this study are relatively new in research terms, there are several opportunities to expand the aims of the present study. Research into the notion of discipline-specific reasoning styles has significant scope, particularly in subjects other than science (although further research might apply the framework for science across the compulsory school age range). In addition to extending application of reasoning styles into other disciplinary areas, future research might also consider English in KS1, in the secondary school age range and beyond. Section 4.6 discusses the decision to exclude two of the reasoning styles identified in the framework in Study One from empirical investigation in Study Two (contextual and structural styles). Although it was necessary to limit the scope of this research, omitting two styles from investigation leaves gaps which future research might seek to address. Additional empirical research might therefore investigate the possibility of promoting contextual and structural styles of reasoning in primary English classes. If considered more relevant to older students, the two excluded styles might be investigated with students at a later stage within compulsory education (e.g. Key Stage 3 or 4).

Future research might also explore the utility of the concept of reasoning styles to an aspect of English not fully explored in this project: writing. Section 3.1.1 discusses the focus in this project on discipline-specific reasoning as part of deconstruction processes (within reading). Discipline-specific reasoning is mainly considered and explored as part of critique and analysis of texts created by others. Further research might explore the potential of using the concept of domain-specific reasoning to support the production element of English (writing). Since the two aspects are mutually dependent and interlinked, it is likely that considering and developing proficiency in discipline-specific reasoning styles would also benefit students as both readers and writers. This, however, requires further investigation.

7.5.2   Methodological Directions

Future research might also contribute to methodological literature. Further development of the coding tool which operationalises the reasoning styles framework for primary English represents a potentially useful avenue for future research. This coding instrument could support further research into domain-specific reasoning in several ways. Firstly, it could be used within larger-scale more systematic research. An experimental design with larger, random samples might be used to obtain more rigorous and generalisable findings. Data collected would still need to be coded and this framework is available. Secondly, the coding instrument for English could be extended to include the remaining two reasoning styles not part of empirical investigation (structural and contextual). These styles could be targeted in further exploratory studies to determine whether they are also realisable and operationalizable. Task-based factors for these two styles could also be explored. Thirdly, the coding framework could represent a template for instruments to measure domain-specific reasoning in other disciplines.

Other empirical research might require increased focus on the levels of progression demonstrated within each domain-specific reasoning style. Examples ranked using SOLO within the coding framework would support such research. A greater use and focus on ranking dialogue according to SOLO categories exemplified in the coding instrument might therefore represent a useful endeavour in future research. It would be interesting to assess whether higher levels of progression are more or less likely depending on reasoning style promoted, task structure used, or presence or absence of adult support.

7.5.3   Pedagogical Directions

This project also prompts further pedagogical-focused research. Future research which is of a larger scale and using an experimental design may investigate effects on reasoning measured in other ways. For example, research might assess whether a reasoning styles intervention based on the exploratory investigation in this project effects aspects such as scores in end of year reading assessments (including the end of KS2 reading SAT). There might also be a focus on whether there is any transfer into student writing, and the quality of reasoning demonstrated there. Other research

might also measure reasoning using reasoning tests (such as Raven's Matrices). Although the domain-specific element would not be incorporated in these, it would be possible to assess whether there was any change in general reasoning capacity following a domain-specific reasoning intervention.

Further research into potential task structures used to promote and scaffold domain-specific reasoning would also benefit future classroom practice. There is limited focus on pedagogical task structures for the promotion of dialogic, collaborative ways of working in primary education. Moreover, research into task types used to support the process of learning to reason is limited. Exploring a wider range of task structures potentially valuable to the promotion of domain-specific reasoning and considering how such structures might be useful in other disciplines may represent a profitable endeavour in future research. This would develop understanding of affordances and constraints of a range of task structures and would permit reflection on their specific and generalisable utility. This would add to research on thinking routines (Ritchhart, 2002; Ritchhart, Church & Morrison, 2011), 'groupworthy tasks' (Lotan, 2014) and powerful pedagogical strategies (Leat & Higgins, 2002), considered in the Literature Review and Discussion chapters.

7.6 Concluding Thoughts

Personal aspirations for this project centred on the goal of improving the teaching of reasoning in primary English. This was fuelled by my experiences as a primary school teacher, where I became frustrated by the lack of attention and support geared towards teaching reasoning in subjects other than mathematics and science. I hoped to support teachers in their efforts to teach students how to reason well in English by "surfacing and animating" (Perkins, 2006, p. 50) important reasoning practices and by considering task structures which can provoke such reasoning. Although conclusions are presented tentatively here, I am encouraged by the promising findings which indicate the utility of the reasoning styles framework, in conjunction with scaffolding tasks, to the promotion of discipline-specific reasoning in primary English.

8 Appendices

8.1 Appendix A: Scheme for Educational Dialogue Analysis (SEDA)

I   Invite elaboration or reasoning

	Key words	Definition	Description	Example
I1	Ask for explanation or justification of another's contribution	Ask participant(s) to clarify or make explicit or explain (another's or collective ideas or reasoning.	Inviting participants to take up someone else's or collective ideas in order to paraphrase, clarify or make them explicit. As in asking someone to put themselves into another's shoes. It does not include simply asking others to repeat someone else's statement.	1. S: It's 7. T: I think it's 12; why would I think it's 12? 2. Can anyone remember, building on what Emma said, why she said inspection? I am a little bit confused. Adam, why has she said inspection? 3. Chloe found the value for X, she's said it's 2. I know she's correct, but *how* do I know that Chloe is correct?

				4. Tell me about Connor's idea about having the same genes or same brain ... people. When you talk to each other and when you listen to each other's ideas.
				5. Who can tell me why they might disagree with Joe?
I2	Invite building on / elaboration / (dis)agreement / evaluation of another's contribution or view	Use previous contribution to **elicit further** responses, inviting addition to or elaboration / clarification / (dis)agreement / positioning / comparison / evaluation / critique of another's contribution or idea.	Includes inviting participants to take up others' contribution(s)/ideas in order to promote the extension, elaboration, or deepening of ideas (Examples 1-4). Includes bringing private contributions or knowledge objects (e.g. outcomes from group work) into the public arena, when further responses/additions are then invited. **Reference to specific prior ideas/contributions/views/theories must be explicit** (through naming an individual or referring to a specific idea). Excludes ambiguous cases such as "What do you think, Mary?" Consider E1 for this. Includes inviting **ideas that are different or similar** to others', or inviting others to identify whether ideas are similar or different (Examples 5-6). Includes asking participant(s) to **critique, evaluate or comment on or compare/agree/disagree** with another's argument/position/conclusion (Examples 7-9), e.g. through	1. Can anyone add to what Johnny said? 2. See if what you came up with is different or similar to the ideas we have on the board already. 3. Take a look at what you have written down and see if you have anything no-one else has thought of. 4. Does anyone have some similar ideas that might fit here?

| | | | - Asking participant(s) to take a position in relation to the topic at hand or asking to agree/disagree with possible courses of action;

- Asking for confirmatory or alternative perspectives;

- Bringing private contributions or knowledge objects (e.g. outcomes from group work) into the public arena.

- Asking for a critique of an idea, position, concept, hypothesis, viewpoint or academic content.

- Inviting a counter-argument. (Example 9)

Consider additionally coding C1 – 'Refer back' where positioning is invited in relation to a reference back to an earlier contribution (Example 10). | 5. Is your idea similar to Manuel's?

6. Did X's idea match with what you thought/discussed/decided?

7. What do you think about what X said?

8. Ricky would you agree with that in view of what you said?

9. What do you think Felix, about that, because earlier you made a distinction between them? Marcel is actually challenging the notion that it's actually possible to imagine it. What do you think? |
| I3 | Invite possibility | **Invite speculation/** imagining**,** | Includes inviting others to imagine new scenarios and to wonder and speculate about possibilities connected to previous | So, what might happen if…..? |

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	thinking based on another's contribution	**hypothesis,** conjecture, or question posing based on another's contribution.	contributions. Typically this might include a conjunction linking to a previous comment: e.g. 'Therefore, what might happen if…' or 'Based on Billy's idea, who has a further question?' The important feature of this code is that whilst it includes invitations to participants to ask open-ended questions, which are typical of creative and divergent thinking, it explicitly links these to ideas already expressed, rather than inviting new ideas (which would be coded as I5).	What questions does Maria's suggestion lead you to? Consequently, what do you 'wonder'?
I4	Ask for explanation or justification	Ask other(s) for **justification/** evidence or explanation of reasoning or the process of arriving at a solution.	Includes asking others to make their reasoning explicit. Note – Questions beginning with 'why' usually ask for justification. Invitations must **explicitly** ask for reasoning, not just ideas/views (E1-'Invite opinions/ beliefs/ ideas'); typically (but not sufficiently) identified through key words such as 'why?', 'how?', 'what caused…?'.' Includes asking for analogies, distinctions, meanings or categorisations of topics/ideas/phenomena/etc; all constitute reasoning. Also consider I6-'Ask for elaboration or clarification'. This may imply adding information to the previous idea or changing it qualitatively. Invitations require a rationale; also consider E1-Invite the expression of different opinions/ideas/beliefs.	Why do you think that? What evidence do you have for that? "How did you arrive at that solution?"

I5	Invite possibility thinking or prediction	**Invite speculation/** imagining**, hypothesis,** conjecture, or question posing.	Includes ask for possibilities and theories to explain a phenomenon; invite the expression of different possibilities based on present information or activity. Often involves extrapolation. Invitations must **explicitly** ask for possibilities, not just ideas/views (E1-'Invite opinions/ beliefs/ ideas'); typically (but not sufficiently) identified through use of conditional tenses or thought experiments as in phrases such as 'what would/could/might happen if...?' Invitations sometimes use future or conditional tense (e.g. thought experiments; especially use of 'would', 'could' or 'might'). Also consider E1-Invite the expression of different opinions/ideas/beliefs, including for open-ended creative thinking. Consider I4-'Ask for explanation or justification' for post-hoc explanations/justifications.	What would happen if...?; What questions can you think of about this story? What might happen next? Which objects do you think might float? What do you imagine the character in this poem is feeling?
I6	Ask for elaboration or clarification	Probe/ask for clarification **or elaboration or extension or example.**	Asking someone to clarify or extend (say more about) a **previous** response, or to illustrate it with an example. This category does not apply when the participant asks for confirmation. Questions beginning with 'Why' usually ask for justification, not elaboration. Note – a probe is not always an explicit question, an invitation may be implicit. Also consider I4-'Ask for explanation or justification', which involves making reasoning explicit (I6 may imply asking someone	T: Has that ever happened to you? S: It happened to me. T: When, or how? Can you remember an example?

			to add information to the previous idea or changing it qualitatively).	

B   Build on ideas

	Key words	Definition	Description	Example
B1	Build on / explain / clarify others' contributions	**Build on**, **explain, clarify, revoice, elaborate, make explicit, highlight** or transform contributions provided by other(s) or collective idea, opinion or reasoning.	Make a **responsive** contribution based on another person's previous comment, argument, idea, opinion or information. This is used when reformulating, building on, explaining, exemplifying, elaborating or transforming someone else's idea/opinion/suggestion. It goes further than the original contribution did; **it may either clarify** (to them and/or to others) **or it may add something**. Includes paraphrasing another's contribution to emphasise, clarify or make it explicit to others (see example 3) but should not be used for repeating someone else's words (unless there is a change of tone). Includes explicitly recognising the contribution made by another (example 2), but not just by praising. Includes putting yourself into another's shoes.	S1: I think she's worried that they might get hurt. S2: Yes, or they might run away. S1: …and sometimes knowledge can't be true S2: yeah S1: Like people tell you things S3: Like stuff on Wikipedia S1: And then you. . . see reasons why that's not true. 2. José made an excellent contribution to solving this

				It includes completing an idea or comment and chaining ideas between two or more participants. Alternatively, it may introduce a different, new idea that is related to a previous contribution.	problem by suggesting we multiply and explaining how that would work
				Includes building on student's knowledge or following up previous contributions.	
					3. What Mary meant was…
				Includes explanation and/or rephrasing of technical terms used by a previous speaker.	
				Includes identifying one's own idea(s) as similar or different to another's (examples 5,6)	4. Why has [Emma] said inspection? Because like you said, the one step sums it's called inspection because you got to find a value of something and it's basically when you're just looking at it and then you get an answer.
				Also consider P1-'Synthesise ideas' when combined with integrating / distilling ideas.	
				It can apply to collaborative writing.	
				Consider C1 when there is an *explicit* reference back.	
				Also consider G4-'Provide informative feedback'.	5. My idea is similar to David's; I put XX
				For clarification of *own* contributions use B2-'Clarify/ elaborate own contribution'.	
					6. I've got an idea that no-one has mentioned yet.
					7. To answer some questions, the children are using a graph. The teacher ask them about what a bar in the graph means:

				T: And this one in particular, what does it mean? The blue part.
				S1: All men of all ages
				S2: **Yes, men, blue is for men and red is for [women].**
B2	Clarify/ elaborate own contribution	Clarify, **elaborate, exemplify** or extend **own** opinion/idea/ belief (without justification) or question.	Applies when the same person makes a new comment/response based on **their** previous comment (but new comment does not include a justification) or elaborates their own previous question.	**1. S1**: A fig is a fruit.
			Also consider R2-'Explain or justify reasoning or solution' for justification.(R2 involves making reasoning explicit. B2 may imply adding information to the previous idea or changing it qualitatively).	S2:......
				S1: It is not the biggest fruit on the table.
				2. S1: Well, knowledge is kind of like what you know as a person.
			For extended contributions including elaboration of a new idea, consider E2-'Make relevant contribution'.	S1:Yeah. What you know as a person. . . and sometimes knowledge can be something maybe that you are good at and may be something someone else isn't good at.
			For clarifications of other's contributions, use B1-'Build on / explain /clarify others' contribution'.	

P   Positioning and Coordinating

	Key words	Definition	Description	Example
P1	Synthesise ideas	Synthesise or summarise others' or collective ideas	Bringing multiple perspectives or ideas into inter-relation and drawing out or distilling a key idea(s) / conclusion / implication. May include ideas from immediately preceding discussion or earlier in lesson / lesson sequence. Must include ideas from more than one person/source (two in total is sufficient). May include own ideas in the collective synthesis. May include integrating or summarising or recapping e.g. after class brainstorm or during/at the end of a group discussion. Also consider B1-'Build on/ explain/ clarify other's contributions' .	T: Ok. So you mentioned school, class, friends, family, places where you live. There is a lot of different things, different knowledge. Knowledge from the family, from experience. Is some of this knowledge more important than other kinds?
P2	Compare/ Evaluate alternative views	**Compare/ evaluate** different opinions/perspectives / beliefs.	Compare/evaluate at least two arguments / positions (may include own or other's), with explanation or justification. For identifying similarity or difference between ideas without judging their value, use B1. Consider R2-'Speculate, hypothesise or predict' for speculations, hypotheses and predictions.	Aaron: David interpreted well. Emily showed good understanding of the historians, but David cross-referenced their positions better than she did.
P3	Propose resolution		This act includes the result of seeking consensus/ agreement, either by suggesting a solution that could be shared by all, or by suggesting that participant should partially agree, or disagree entirely, **after discussing a task, issue or problem**.	1. So, shall we go with option B?

			Other participants need not agree or share the viewpoint.	2. I think we're in agreement that a suspension bridge would be the best solution.
P4	Acknowledge shift in position	Participants acknowledge that they have **shifted their position** in response to the preceding dialogue.	It includes clarifying a misconception or changing opinions/ideas/beliefs. There has to be evidence of the shift/adjustment in position or change of mind in the dialogue. E.g. change in the argument or idea that the participant was exposing earlier. It requires an explicit statement. Consider P6 'State (dis)agreement/ position' .	I like that Robert and it wasn't what I'd thought of. I thought I was going to write something else on here [recording Robert's view on the board]. I see what you mean, I agree with you now that C is probably right, not B.
P5	Challenge viewpoint	Challenge viewpoint / assumption	Challenging / confronting others' view / assumption / argument. The challenge must be evident through verbal (or nonverbal) means, including questioning. This should not be used when a simple 'no' response is given. If it is an explicit statement of disagreement use P6-'State agreement or disagreement'. Use more specific codes where they apply (e.g. I1 or I6E3) Includes partial agreement.	Can we really say that 'knowing how to eat a salmon sandwich' is a form of knowledge? But then that wouldn't happen if…

				Do you really think these angles are the same?
P6	State (dis)agreement/ position	State that one or more participants (dis)agree with others or acknowledge differences	One or more participants state that they agree or disagree with at least one other (Example 1). This act includes the result of seeking agreement, either by arriving at a solution or acknowledging participants' differences **after discussing a task, issue or problem**. Positioning in relation to other must be explicit. For a statement of different viewpoint, consider P5. If a reason is given (Example 2), also code with R21a 'Explain or justify reasoning or solution.' For agreement, at least 2 positions must have been expressed previously so that one is chosen over the other. For disagreement or partial agreement, a simple statement is sufficient (since we assume two perspectives have been compared). Includes agreeing a course of action (under above conditions). If the statement is of disagreement with a justification (counter argument) code P6 + R2.	1. I disagree with John; We all agree on that; I don't agree with you on that, I agree with Mary; most of us agree/disagree that X was more convincing than Y; 2. I agree with Lucy… it says here Vishnu adopts various forms rather than just one. 3. I don't think that's right, I think.... 4. That's partially true, but not when….

C   Connect

	Key words	Definition	Description	Example
C1	Refer back	**Refer back to prior contributions** or observations or knowledge objects or discussions after contributions.	This code should be used when explicitly reviewing, referring to or bringing in a specific contribution (by an individual or group; of one's own or another's) or observation, linking prior knowledge, concepts, beliefs, hypotheses, agreements /conclusions reached, opinions, arguments, ideas, learning content to the current topic or activity. Includes reference back to prior learning from interaction with texts including multimedia resources where these are linked to present/future activities. Contributions could come from the current or previous lessons. Consider E2-'Build on others' contributions' when responding rather than explicitly referring back, even if the contribution responded to was earlier than the preceding turn. Consider C2-Making learning trajectory visible (if reference is to activity or to prior learning from / interaction with texts including multimedia resources, rather than contributions).	1. In the last lesson, **Robert's group** gave a great example of how …… The way you just used "energy" is correct now… remember when we first talked about it some people thought it was the same as light? 2. Jamie has a brilliant method for calculating volume of this shape (cone + ½ sphere)… his method is a real application of our previous topic on simplifying surds. 3. And I think we decided at the end of [the discussion], that it was quite difficult, wasn't it? Because the situation was a child was being hurt.

				4. What was the point you just made earlier [during pairwork] when we were discussing?
C2	Make learning trajectory explicit	Make learning trajectory explicit, providing continuity **within and across lessons**, including **by highlighting relevance to prior or future activity.**	Includes encouraging others to record ideas and/or outcomes of dialogue. This code should be used when reviewing past activities and **linking** them to present/future activities, as part of making the trajectory explicit. Includes referring forward to an activity or contributions to be requested (Example 4). May include making explicit goals or purpose of learning trajectory. Also consider C1- refer back for linking to past contributions. Consider B1-Build on / explain /clarify others' contributions.	1. Last time, we had a nice simple scenario, didn't we, about the granddad… 2. A bit later on, we are going to think about some key points to go with each one that your group has come up with. So we've done lots of talking, lots of thinking, you are brimming with good ideas. Now I want you to get some key points. 3. To try and answer a question about trench warfare, what have we got so far? We know about the doctor, do you remember the doctor evidence that I gave you? We've used the poem, we've used the video about the poem, we've just used that bit of DVD, and we've had a lot of quite rich discussion about this. Now,

				have you got some ideas about this [question]: 'Is it possible for us to imagine the experience of trench warfare?' 4. "At the end of the lesson I'm going to ask you to write down what you think. So everyone in your group needs to be involved, OK, because you're going to be telling me what you think happened and why. OK? You are going to be constructing your own argument."
C3	Link learning to wider contexts	**Make links** between what is being learned and a **wider context**.	Bringing knowledge from outside of the classroom or school (i.e. beyond, before or after the current lesson) into the discussion of what is being learned, relating previous experiences within or outside the school, linking given and new information. This relates to the temporal dimension of learning (in different time frames, from very local to very extended in time, and also creation of inter-textual and inter- contextual relations). Includes generalising to other similar instances/contexts. This may include personal experience/memory, analogy or anecdote, especially from younger children and/or when used to justify.	Some people might have more knowledge than other people. . . I know a lot about horse riding because I have experience of having my own horse. 2. Everybody has safety rules. We have safety rules at school. I bet you have

			Consider C1 -Refer back- if the reference is to previous contributions or lesson activities.	rules in your family. Tell me a rule in your family?
C4	Invite inquiry beyond the lesson	Ask others to pursue their own inquiry before, or after lessons.	This may include asking others to pursue individual or shared enquiry (this relates to Wells' concept of 'dialogic inquiry').	1. Do you think you might find similar creatures in a soil sample from your garden, or your local park?
			This includes asking others to pursue inquiry prior to teaching a topic or to deepen knowledge afterwards. (This leaves open the possibility for inquiry. It sustains and extends dialogue across time and space).	
			May involve withholding information, evaluation and feedback, or ending a lesson on a 'cliffhanger'.	2. We'll find out next time whether the raft will sink or float. But I'd like you to look at them again first to see if you're confident in your predictions and your workings.
			It may also include inviting individuals or groups to conduct an independent investigation beyond the lesson and bring back results to be collated and/or discussed as a whole class.	
			For enquiry within the lesson consider G2-'Propose action or inquiry activity' or I5 – Invite possibility thinking.	

G   Guide direction of dialogue or activity

	Key words	Definition	Description	Example
G1	Encourage student-student dialogue	Encourage student-student dialogues by giving pairs/groups or class the responsibility for the direction and/or outcomes of the dialogue or the collective activity.	Includes allocating responsibility to students, pairs or groups for the dialogue or the activity – whether or not the teacher is moderating the discussion. Not used when simply setting group work or asking pairs to work together; there needs to be some dialogic element in the task.	Example 1: (*One of the kids understood the task before the others did*) -Edgar, why don't you explain to them what we have to do? Example 2:(*A girl from the team came back with a calculator, and missed a doubt the other kids had*) -Explain that question to her, read it carefully. Don't worry if you haven't quite finished [pair work] because we are going to build on each other's ideas [in the whole class plenary].
G2	Propose action or inquiry activity	**Propose possible courses of action or an inquiry activity**.	Propose a course of action in the context of a dialogue or collective activity, or propose an inquiry activity. It may also include inviting individuals or groups to conduct an independent investigation and bring back results to be collated and/or discussed as a whole class within the same lesson	1. I want you to break into threes now and discuss which of these sources you think is the most reliable account of the battle. 2 So please, in your pairs, come up with an outline

			This is not applicable to simple instructions which are not of a dialogic nature (such as reading out a task or question, which is uncoded). Consider R2-'Explain or justify reasoning or solution' if it includes explanation or justification of reasoning. For inquiry beyond the lesson use C4-'Invite inquiry beyond the lesson'. Also consider I5 – Invite possibility thinking.	plan for a letter to a newspaper arguing your case for the appropriate age for the right to vote.
G3	Introduce authoritative perspective	Explicitly introduce **authoritative perspective or explanation as part of the flow of dialogic interaction**, in response to participants' level of understanding.	Implies invoking voice/perspective of expert from beyond the present dialogue, e.g. to challenge others' thinking or to take on that perspective (Example 3). This may include authoritative contribution – i.e. making a teaching point – that builds on a learner's contribution or knowledge (Example 2). Includes introducing or bringing in technical terms. NOTE: Determining if it is adjusted to learner's level is difficult and needs to be established through the particular context of the dialogue. In addition, an authoritative explanation deals with reliability and knowledge of the content. It may be accompanied by diagnostic strategies such as closed Qs or prompting to confirm that students have understood or learned target concepts, but these strategies are not part of the CA.	1. So what they did instead, they found the median, and remember finding the median means putting them in order, and finding the one in the middle. 2. S: They might run away! T: Very dangerous, isn't it? 3. What would Newton say? 4. Mrs Smith says that sometimes it's good to make a mistake because you learn from it.

G4	Provide informative feedback	**Provide informative feedback** on which others can build.	This refers to formative or diagnostic feedback instead of simple positive, negative or non-committal judgment, or mere repetition of the respondent's answer.	Thanks, Nancy - you found a good balance in your answer between the perspectives of those three sources.
			G4 may be used alongside other codes that indicate the form of feedback, e.g. B1 – 'Build on/ explain/ clarify others' contributions'.	I enjoyed your performance - but you'd engage the audience more if you made more eye contact.
			Likewise, feedback may be accompanied with justification, explanation or elaboration, in which case assign two codes.	
G5	Focusing	**Focusing the dialogue on key aspects of the activity**	This may be used when **guiding** or focusing the dialogue in a certain desired direction or towards certain key aspects of the activity. Involves feeding in / highlighting salient ideas.	But also if someone was scared to go home, **what might they actually do instead?** *[T pre-empts dangerous conclusion by stimulating Ss to think about consulting an adult]*
			It may involve:	
			(1) feeding in through questioning or suggesting or pointing out salient information about the task or problem. This includes clarifying the task or problem or deepening the discussion. May help to *narrow* the field of focus or pre-empt undesirable conclusions. This includes bringing participants back to the matter at hand. Excludes repeating an earlier question.	
			(2) extending the field by stimulating thinking in another direction not yet thought about.	
			(3) encouraging others to 'discover' new knowledge (as in scaffolding).	
			Excludes simply reading out or turning to a task or set question (which is uncoded).	

			G5 may be used alongside other codes that indicate the form of focusing, e.g. I6 – 'Ask for elaboration or clarification', I4 – 'Ask for explanation or justification' or R3- 'Speculate on the basis of another's contribution'.	
G6	Allow thinking time	**Invite or propose** to pause to think, reflect, or respond or talk.	**An explicit invitation or proposal** to pause, for example to think or reflect or decide. **OPTIONALLY:** Code when the elicitation is not verbally explicit and there is a pause of at least 3 seconds after an invitation. Code only pauses within the exchange.	Let's think about this for a minute. There's no rush, take your time. I'm going to ask you in a few minutes for your responses so have a think about what you want to say.

RD Reflect on dialogue or activity

	Key words	Definition	Description	Example
RD1	Talk about talk	Participants talk about talk, reinforce protocols of dialogue, or model effective dialogic techniques.	This includes talking about or constructing ground rules for communication. Refers to metacognitive talk about talk rules/protocols, whether rules are established or not. Includes talk about quality or purpose of talk. Does not include reflection on use of language, e.g. technical terminology: consider RD2-'Reflect on learning process/ purpose/ value'. Model productive ways of interacting, e.g. by showing how to 'think aloud'; how to explain; how to argue by providing reasons, justifications and evidence; and how to hypothesise.	1. If we can try and use these rules as well, it's going to really help us get some good work out of our discussion. 2. I'm sorry for butting in your group there. But actually from what I was seeing, this way you were working, you were listening to each other quite well and it seems to me that you have been, have you been questioning each other? Cause it seems to be, I heard Rosie say something like, "What would you do if you were in that situation?" and that's quite a good thing, isn't it? So I should just set that question up so it gives you a chance. 3. The grownups are going to be very much looking at how your group is working together, because you've got a job to do, haven't you? You've got to come out with a result at the other

				end, and if you can't work on your ground rules and be cooperative, you won't solve, you won't come out with your result. Okay? So we'll keep those in mind. […] I do want you to try and agree on advice on what to do in that situation.
RD2	Reflect on learning process/ purpose/ value	**Comment / talk about the process** of carrying out the collective activity or evaluate own performance. Or **reflect on the importance,** usefulness, purpose or outcomes of learning or of the task , as part of a collective activity.	In this act there has to be an *explicit statement that refers to the collective* activity. (Individual meta-cognition without such reference is not coded in this scheme.) Participants analyse the processes involved in the development of the task and/or the effectiveness of their (individual or collective) performance during a collective activity (Examples 1 and 2). They might reflect on how they are learning/have learned (including from others) or whether they are/were using effective strategies for the task at hand; how well they performed; their level (or lack) of understanding; what they can do to improve their performance; what the next steps are to complete the task; to what extent they have achieved the goals of the activity, etc. Assumes an element of evaluation or reflection; does not include procedural comments such as how much longer it will take to finish an activity. . Includes *affective* dialogue: feelings / experiences about working together (Example 3).	1. I enjoy it just because we can all share an idea if we want to and sometimes I don't enjoy it as much because it's always the same people sharing their ideas. 2. I like it because it's just nice to actually talk about a single book as an entire class and we can just share any idea and it can give us other ideas for our writing. 3. I didn't feel I did very well today because no-one paid attention to me. 4. [example on use of language/terminology]

			E.g. How did I feel when we were doing the task together? What do I feel about my performance? What do I feel about the outcome of the collective activity? OR Analyse, reflect on or evaluate importance of learning and/or outcomes. Includes discussing and reflecting on past-present-future trajectory. E.g. Why do we need to learn x? How/where can we apply what we learned? When will it be useful? Includes talk about the purpose of a shared discussion activity, where there may be no ground rules explicitly operating. Also consider RD1-'Talk about talk'. Includes reflecting on use of language, e.g. technical terminology	
RD3	Invite reflection about process/ purpose/ value of learning	**Invite others to reflect** on the importance, usefulness, processes or outcomes of learning from collective activity.	Includes encouraging others to analyse or evaluate their own learning processes and/or outcomes. There has to be an *explicit statement that refers to the collective* activity. Includes inviting to reflect on purposes/goals of learning or the activity or on past-present-future trajectory. E.g. Why do you learn x? How/where can you apply what you learned? It includes encouraging *affective* dialogue: feelings / experiences about working together. E.g. How did you feel when you were doing the task together? What do you feel about your performance?	1. So who thinks they might change their uses of energy as a result of today's lesson? What changed your mind, and why? 2. How did you feel about being in a 'note-taker' role in your group today? Was it valuable? Or maybe frustrating?

			What do you feel about the outcome of the collective activity?	

E Express or invite ideas

	Key words	Definition	Description	Example
E1	Invite opinions /beliefs/ideas	Invite the expression of **opinions/ideas/ beliefs/knowledge** from others.	ccc Includes inviting open-ended creative thinking, but consider I5-'Invite possibility thinking', when inviting speculation, hypothesis, conjecture or question posing. Also consider I4-'Ask for explanation or justification', which asks for reasoning, not just ideas/views. Excludes just calling on someone in order to invite them to speak (which is uncoded unless another function is explicit).	1. What do you know about how electricity works? 2. Ok Rebecca do you just want to take suggestions **about what people think** is really important. 3. What do you think about this way of learning, of this way of getting knowledge?

|				4. Any other points to make here?
E2	Make other relevant contribution	Offer a pertinent, **contribution** /suggestion /idea / perspective/ information that progresses the collective activity at hand.	To use this code, the contribution has to bring something not yet expressed to the discussion that is related to the general subject. Includes generating ideas during a brainstorm or bringing ideas from a small group discussion into a larger discussion on the same topic – without making links to others' contributions. The contribution must be pertinent to the task at hand. It may be either short or 'extended.' Does not apply when someone repeats or emphasises their own prior contribution, except when doing so to someone not present before. Includes simple feedback such as "I think that's a good point" or "I can see that point", but not simple "yes" or "no" responses. **Important: Always use a more specific code (only) where one applies.**	1. Electricity is what powers radios and computers. 2. *What words would you use to describe what it was like for the soldiers in a trench?* S: Bombs hit unexpectedly. S: They're sitting ducks. S: Bravery.

(Hennessy et al., 2016) https://www.educ.cam.ac.uk/research/projects/analysingdialogue/

8.2 Appendix B: Cambridge Dialogue Analysis Scheme (CDAS)

Table 1. Descriptions of dialogic moves codes and agreement levels.

Codes	Definition	
Elaboration invitations (ELI)	Invites building on, elaboration, evaluation, clarification of own or another's contribution. E.g. 'I agree with you it makes a strong picture, but what do you picture?'	
Elaboration (EL)	Builds on, elaborates, evaluates, clarifies own or other's contribution. E.g. (in reply to 'It's sort of describing how you do it) 'Yes, it's got a good emphasis and a good use of vocabulary'	
Reasoning invitations (REI)	Explicitly invites explanation, justification of a contribution or speculation (new scenarios), prediction or hypothesis. e.g. 'Why do you think the bottle floats?'	
Reasoning (RE)	Provides an explanation or justification of own or another's contribution, or speculates, predicts, hypothesizes with grounds given. E.g. (After 'He came back') 'because he made a promise'	
Co-ordination invitations (CI)	Invites synthesis, summary, comparison, evaluation or resolution based on two or more contributions. E.g. 'Would anyone like to summarize the ideas we've been hearing?'	
Simple co-ordination (SC)	Synthesises or summarises collective ideas (including own and others' ideas)E.g. 'Some of you are talking about weight and some are talking about size; both matter – things float when they're light for their size'	
Reasoned co-ordination (RC)	Compares, evaluates, resolves two or more contributions in a reasoned fashion. It includes all SC descriptors plus a counter-argument, reasoned rebuttal, two partial truths, e.g. drawing on evidence, theory or a mechanism. E.g. 'We've been arguing about how much of personality is inherited; twin studies show conclusively it's 50%'	
Agreement (A)	Explicit acceptance of or agreement with a statement(s). E.g. 'Brilliant', 'Good'	
Querying (Q)	Doubting, full/partial disagreement, challenging or rejecting a statement. E.g. 'Do you really think these angles are the same?'	
Reference back (RB)	Introduces reference to previous knowledge, beliefs, experiences or contributions (includes procedural references) that are common to the current conversation participants. E.g. 'Can anyone remember which of the animals we saw at the zoo are nocturnal?'	
Reference to wider context (RW)	Making links between what is being learned and a wider context by introducing knowledge, beliefs, experiences or contributions from outside of the subject being taught, classroom or school. E.g. 'It's like in Macbeth where the storm builds into it'	
Other invitations (OI)	Invitations of all kinds of verbal contributions (e.g. opinions, ideas, beliefs), except for those coded as EL, REI or CI. This includes invitations on a new topic if this does not fall in another invitation code, and procedural questions.	

(Vrikki et al., 2019, p. 7).

8.3   Appendix C: Structure of Observed Learning Outcomes (SOLO) Taxonomy
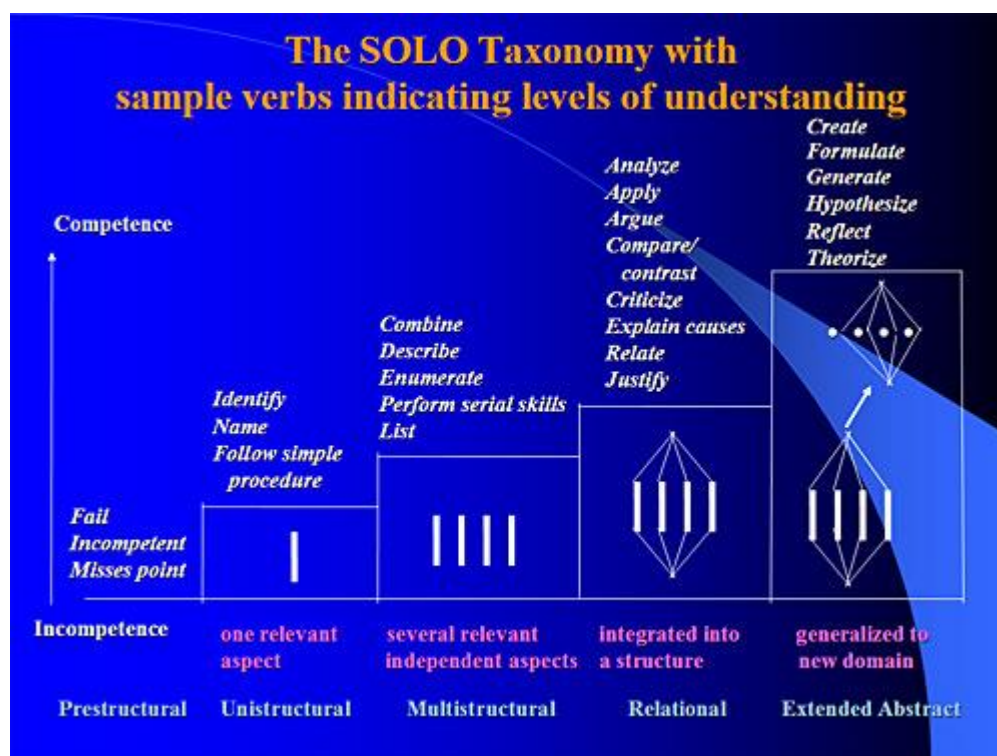
(Biggs, n.d.; Biggs & Collis, 1982)

Durham University
School of Education

Shaped by the past, creating the future

02/11/2017

Michaela Oliver
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Dear Michaela,

Exploring and developing cultural reasoning in primary English (2843)

I am pleased to inform you that your ethics application for the above research project has been approved by the School of Education Ethics Committee.

May we take this opportunity to wish you good luck with your research.

Yours sincerely,

Dr Nadin Beckmann
School of Education Ethics Committee Chair

Durham University
School of Education

05/01/2018

Michaela Oliver
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Dear Michaela,

Exploring and developing cultural reasoning in primary English (phase 2)

Reference : 2907

I am pleased to inform you that your ethics application for the above research project has been approved by the School of Education Ethics Committee.

May we take this opportunity to wish you good luck with your research.

Yours sincerely,

Dr Nadin Beckmann
School of Education Ethics Committee Chair

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