The nature and role of critical thinking in academic writing from a social-cognitive perspective

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Abstract

This thesis examines the nature and role of critical thinking (CT) in academic writing. It responds to calls in the literature to make explicit this problematic notion described as a "conceptual swamp" by CT scholars and referred to via various terms and assigned meanings.

To address the problem, a theoretical construct for CT in academic writing was developed by first identifying its core components using CT literature and then fleshing the components out using social and cognitive theories of writing. The construct was then applied to a small sample of authentic texts, the introduction sub-genre of theses (nominated exemplary (EX) and non-exemplary (NE) in their display of CT) to examine its nature in written texts and the role it plays in differentiating the rhetorical quality of successful from less successful texts.

The findings suggest that CT comprises at least three interrelated facets of problem solving, knowledge transformation and normative evaluation and a different set of thinking processes for the operation of each. The findings also suggest that the knowledge required for the operation of CT is tacit and embedded in the disciplinary context and the facets can be instantiated explicitly or inexplicitly. It was found that the role of CT in academic writing was to guide problem solving and normative evaluation so that social-culturally appropriate and rhetorically effective genre outcomes (choices) are produced in text construction.

The study contributes a theoretical framework for use with genre analysis to infer CT in academic writing. It also contributes a holistic conceptualisation of CT that provides a framework to reinterpret existing interpretations of CT more explicitly and a model for writing professionals and supervisors to help students fulfil the CT requirement for successful academic writing.

The pedagogical implications suggested by the findings include the need to create learning environments where the acquisition of CT is embedded in a disciplinary context, the need to make thinking visible, the need to provide constructive guidance through feedback (Bailin, Case, Coombs, & Daniels, 1999a; Hyland 2004b, Kurfiss,1988). Though this study of CT rests on the analysis of a small sample of high-stakes research writing texts, the model developed can be adapted for apprenticing novice writers into the CT knowledge and thinking required for constructing all genres of academic writing.

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Glossary

The glossary provides a brief definition of key terms used in the present study. Its purpose is to provide a common basis of understanding of these terms.

Citation/intertextual analysis: the analysis of the various functions of citations in terms of how they relate to one another and to the writer's text (intertext), to advance the writer's argument.

Citation: the use and referencing of source texts and their authors to construct arguments. Citations are used in a text to serve different functions or intertextual rhetorical goals.

Claim of significance: the communicative-/rhetorical-argument purpose or goal typically associated with the introduction subgenre. This claim is associated with the need for a writer's proposed research.

Context: the discourse community within which a genre is enacted.

Declarative knowledge: background knowledge related to facts and concepts in a field of inquiry and includes content knowledge as well as other types of background knowledge such as knowledge of concepts (e.g., elements of argument structure), beliefs, values and practices relevant to reasoning.

Discourse community: a group of writers and/or speakers who share commonly agreed upon or understood practices and conventions of how to achieve shared communicative purposes of genres. The members who belong to an academic discipline, for example, comprise such a community.

Discourse-based interview (DBA): a method of interview that uses a writer's sample of writing to elicit knowledge or strategies that writers bring to the composing act, which are generally tacit in nature.

Genre analysis: is a form of discourse analysis which is used to understand how language is used by individuals to achieve a communicative-/rhetorical-argument purpose or goal.

Genre knowledge: knowledge of the conventions and practices related to enacting a genre to achieve its rhetorical or communicative purpose. This includes knowledge of genre devices such as moves, stance and citations and how they can be used in the construction of a genre.

Genre: an action that involves a conventional way of acting to achieve a communicative/rhetorical purpose such as to convince, to apologise, to request, to eulogise. A subgenre is considered part of a larger genre.

Interrater reliability: the degree of agreement between the raters who score or analyse a text. A 75% agreement is acceptable in most fields.

Knowledge transformation: the use of information from source texts in new and novel ways to serve the developing argument of a text being constructed.

Mental acts: the term used for what a writer needs to be able to do such as to construct a task representation, to assess the fit between genre decisions and reader expectations, to identify warrants in an argument, to recognise novel associations among others.

Mental processes: the term used for unseen mental processes such as differentiating, interpreting, anticipating, hypothesising, assessing among others.

Move analysis: the analysis of how moves in a text are enacted to achieve a coherent text/schematic structure that achieves a communicative purpose.

Move: a rhetorical unit in a text that serves both a local/micro- and global/macro-communicative purpose or rhetorical goal in a text. Moves are made up of one or more steps.

Normalising: a procedure used to enable an analyst to compare the scores of features analysed in texts of differing lengths.

Normative evaluation (epistemic evaluation): The analysis of the components of an argument to make a judgement about the validity of a claim being advanced. The reasoning associated with epistemic evaluation is termed logical reasoning. It is used to make judgements about what is true.

Normative evaluation (non-epistemic): The reasoning associated with evaluating the steps undertaken to lead to a solution in problem solving. This reasoning is used to make judgements about what best to do or whether the solution proposed for a problem is efficacious.

Problem: a state where a gap exists between the current and expected state where a solution is required to find a way to achieve the target state.

Problem solving: a series of steps undertaken to reach a solution for a problem. The reasoning involved in executing the steps is termed problem-solving reasoning.

Procedural knowledge: knowledge about when and how to use relevant background knowledge or declarative knowledge.

Skills: the term used to describe thinking in terms of performative actions such as identifying components, determining credibility, recognising and anticipating, selecting among others.

Social construction: a view that knowledge is not an abstract, objective and absolute truth but a reality that is constructed through interaction and negotiation.

Social cognitive: used for thinking and reasoning that is shaped or influenced by the social norms and practices embraced by the members of a discourse community for participating in interactions.

Stance/interpersonal/lexico-grammatical analysis: the analysis of the various stance-taking strategies, which appear in the form of lexis (words which convey meaning within grammatical parameters), used to persuade readers to accept the writer's claims.

Stance: is a signalling of the position a writer takes in relation to their writer and texts. Stance-taking devices are used as persuasive strategies in a text to serve different interpersonal rhetorical functions or interpersonal rhetorical goals.

Strategic competence: the writer's ability to mediate criteria provided by a rhetorical context through appropriate goals and strategies in order to make rhetorically effective decisions in text construction

Text: a product that represents the language or discourse used in a genre to achieve a communicative-/rhetorical-argument purpose or goal.

Text construction: a term synonymous with writing. It is typically used by cognitive writing theorists.

Chapter 1

The need to understand critical thinking in academic writing

This study is about understanding the nature and role of critical thinking (CT) in academic writing, using the introduction subgenre of the thesis as the focal point.

In the first part of my introduction, I argue for the need and significance of my study. I do so by highlighting the importance of CT for successful academic writing and by identifying the problems found in existing conceptualisations that make it difficult for students to fulfil their assessor's expectation of finding evidence of CT in their writing, and for writing professionals to help students acquire the notion. Three problems in particular are highlighted: the confusing use of terms and interpretations that refer to CT, the incompleteness of existing conceptualisations of CT, and the lack of adequate acknowledgement of the complexity of the CT construct which has been applied in academic writing.

Following the creation of the niche for my study, I occupy it by articulating the research problem my study will solve. I then make explicit the research objectives I hope to fulfil through my study and present the accompanying research questions which guide its design. My first research question asks what the nature of CT is in academic writing and my second research question asks what its role is in differentiating successful from less successful writing.

The rest of the chapter develops the details of the design used to solve the research problem. Literature from both CT and academic writing theorists is used to first develop a construct for CT which provides the theoretical framework for identifying the components and the operation of CT in academic writing. This framework is then used with three methods of genre analysis to flesh out the nature and role of CT in academic writing. I also include a section that discusses the field in which my study is located and the various other fields (which existing CT research spans) from which it draws to achieve its research aims.

Finally, I specify the contributions of my study to academic writing research in general and to English for Academic Purposes (EAP) research in particular, before providing an overview of how the thesis argument is structured in the chapters that follow.

1.1 The Importance of Critical Thinking in Academic Writing

The expectation for students in Anglophone contexts of higher education to exhibit CT in academic writing appears in subject guidelines, assessment criteria and in written feedback to students, as cited in Woodward-Kron (2002; e.g., Clancy & Ballard, 1981; Germov, 2000; James et al., 1995). As an educational ideal with roots in the domains of philosophy and cognitive psychology (Kurfiss, 1988; Lewis & Smith, 1993; Sternberg, 1986), CT is required practice in higher education. Lea and Street (1999) have identified three levels of practice which they refer to as the institutional, disciplinary and individual levels. A quick search on the university website where I'm enrolled shows up CT as one of the six generic clusters of capabilities the university seeks to foster in all graduates through the teaching and learning experiences of their programmes. It appears in the University of Auckland Graduate Profile website as:

> **Critical Thinking**: Graduates of the University are expected to be able to contest knowledge and practice, critically consider ideas, texts and research and think reflectively and reflexively. (University of Auckland, n.d.-b)

It appears in the assessment guidelines for PhD students published by the university's Graduate Centre, as follows:

> Demonstrates knowledge of the literature relevant to the subject and the field or fields to which the subject belongs, and the ability to exercise **critical and analytical judgement** of it. (University of Auckland, 2018, 1e iii)

> It also appears at the disciplinary level as one of the core skills to be developed for employability. Below is an example extracted from the Faculty of Arts website:

> **Benefits of the BA**

> Be equipped with the knowledge and skills to successfully navigate a changing and challenging world.

> Choose from an exciting range of subjects across the humanities, social sciences and languages. Enjoy the freedom and flexibility to study the subjects that interest you.

> Develop skills for many career opportunities in the future: effective communication, **critical and creative thinking**, the ability to research and analyse, and global awareness. (University of Auckland, n.d.-a)

At the individual level, the requirement for students to display CT appears in the literature on assessment and academic writing for all levels of writing. The requirement to display CT is translated into writing outcomes in undergraduate essays and appears as comments such as: "display a complex weighing of evidence and analysis of alternative theoretical perspectives" (Smith, Campbell, & Brooker, 1999, p. 331)

At the postgraduate level, the requirement appears as "critiquing the published literature" (Bitchener & Banda, 2007, p. 66), the ability to "assess and weigh up the value and importance of claims" and "identifying arguments for and against theories, ideas, claims that were published" (p. 66). Andrews (2007), in his assessment of MA theses, concludes that at master's level, the "key dividing line of work above the line" is that "it is argumentative as opposed to merely exposition and it possesses a critical dimension." (p. 10)

At the PhD level, examiner comments on the expectations of CT are consistent with those found at the other levels. Mullins and Kiley (2002) found that examiners expect writers to be "critical of previous work" or "make assessment of their work, displaying a high level of thinking and analysis in the process" (p. 380). Holbrook, Bourke, Fairbairn, and Lovat (2007) report similar findings on examiner expectations, where the hallmarks of better-quality theses were found to be "coherent and substantive use of literature" and the ability to "critically appraise it" (p. 337).

Although the requirement to display CT for successful academic writing is explicitly non-negotiable in higher education, the understanding of what the notion actually means is far from explicit (Andrews, 2007; Atkinson, 1997; I. Bruce, 2014; Jones, 2007; Lilis & Turner, 2001; Moore, 2011; Richards, 2000, Smith et al., 1999; Woodward-Kron, 2002), making it difficult for academic writing professionals and supervisors to help students, who often find this expectation extremely challenging to meet. Students need to learn what CT is and how it may be expressed, and writing professionals need to be able to be more explicit about the nature of thinking and reasoning required in writing to help students meet the expectation of demonstrating CT.

The problem of fulfilling expectations of CT is challenging for both native and non-native speakers at both undergraduate and graduate levels. Non-international students at undergraduate level (Smith et al., 1999) and graduate level (C. Bruce, 1994) tend to serially list points rather than critically evaluating, synthesising and defining information to construct a well-formed argument with a coherent thesis. Qiang and Krugly-Smolska (2008) and Cadman

(1997) report similar findings about postgraduate international students. Qiang and Krugly-Smolska (2008) find that students are reluctant to critically evaluate literature and Cadman (1997) reports that students have difficulty interpreting and applying criteria such as "convincing account, ordered critical and reasoned exposition, ability to make critical use of published work and source materials" (p. 5). According to Samuelowicz (1987), undergraduate international students are reluctant to "discuss, criticize reading and express an opinion" (p. 125) and the problem is more prominent among postgraduate students where there is a greater demand on critical and speculative thinking in postgraduate courses.

Whether our students are transiting from high school to university (Flower et al., 1990) or from a non-Anglophone system of education to an Anglophone university (Angelova & Riazantseva, 1999), there is an urgent need to make the notion of CT explicit in existing writing literature. CT is crucial for the academic success of these students, who are assessed through their writing (Andrews, 2007; Lilis & Turner, 2001; Richards, 2000; Smith et al., 1999; Woodward-Kron, 2002).

At least three problems can be identified with existing conceptualisations of CT in academic writing. They are: a lack of consistency and clarity in how existing labels and interpretations of CT are used and relate to one another, an overemphasis on interpretations of CT from the philosophical tradition at the expense of interpretations from the psychological tradition, and an inadequate acknowledgement of the complexity of the notion of CT. It is accepted in CT literature that definitions of CT are usually made in terms of formal or informal logic (from the tradition of philosophy) and later also in terms of general problem solving (from the tradition of cognitive psychology) (Lewis & Smith, 1993; Meyers, 1986). It is also now generally accepted by a large camp of CT researchers that the operation of CT is more complex than the exercise of general logical reasoning and problem solving because CT requires specific contextual knowledge such as content knowledge and knowledge of a discipline's conventions and practices for its operation (Bailin et al., 1999a, 1999b; McPeck, 1981, 1990; Moore, 2007, 2011; Meyers, 1986; Willingham, 2007).

1.2 Multiple Labels and Interpretations of CT

The term CT, in existing academic writing literature, appears to carry multiple shades of meanings and guises exhibited as various confusing forms or terminology. The term "critical" appears in guises such as "critical evaluation" or "critical analysis" (Woodward-Kron, 2002, p. 122), "criticality" or "critical voice" (I. Bruce, 2014, p. 85; Pemberton & Nix, 2012, p. 122),

"academic criticism" (Cheng, 2006, p. 279) and "critical literacy" (Flower et al., 1990, p. 4), among the most common. Though the words and phrases are connected etymologically by the root word critical, meaning "discerning judgements based on standards" (The Foundation for Critical Thinking, n.d., para. 6), which leads to the logical assumption that they all have something in common, a closer look at how they have been interpreted explains the existing calls in the literature (Andrews, 2007; Lilis & Turner, 2001; Smith et al., 1999; Woodward-Kron, 2002) to make the term "critical thinking" in academic writing more explicit for instruction.

Woodward-Kron (2002) likens critical evaluation, critical thinking or critical reasoning to discursive practices such as "critiquing the established knowledge, developing argument supported by evidence, and evaluating phenomena according to selected criteria" (p. 127). I. Bruce (2014) uses criticality interchangeably with critical voice to mean instances of critique or stance, suggesting that "criticality", "voice", "critique" and "stance" all refer to CT. Pemberton and Nix (2012) also use Bruce's term criticality, but interpret it more broadly as the integration of being critical about formal knowledge, about own beliefs and ideas, experiences and practices as well as about being critical about the world and our place in it, suggesting that criticality could have a broader meaning. This then begs several questions such as whether CT has various shades of meaning, how one knows which shade of meaning each of the terms mentioned above refers to, and what core meaning (if any) CT has to justify these terms as constituting CT.

The list of interpretations of CT goes on; and here are two more that are commonly used. Cheng (2006) uses the term "academic criticism", yet another permutation of the root word critical, and interprets it in a similar manner to I. Bruce's (2014) criticality, to mean "a statement which reflects a discrepancy between the stance of a researcher/author, on one side, and that of another researcher or the discourse community as a whole" (Cheng, 2006, p. 279). Academic criticism here seems to be another term used to refer to I. Bruce's use of criticality to mean a writer's "stance" but a term that does not carry Pemberton and Nix's (2012) broader meaning for criticality. Flower (1990) uses the term "critical literacy" to refer to higher literacy that "questions assumptions as well as transforms information for a new purpose" (p. 4), begging the question of how critical consciousness relates to all the other terms mentioned earlier and to CT.

As mentioned above, based on the meaning of the root word critical, the various terminological permutations have to do with making judgements about the state of knowledge and defending these judgements using some form of standard; but the question that still remains to be answered is, since there are so many terms such as "critical analysis," "critical reasoning," "stance," "voice," "critique," "criticality," "criticism" and "critical consciousness" for the one term "critical thinking," how exactly are the terms similar or different to one another? Without a clearer understanding of how the different shades of meaning relate to one another in referring to CT, the notion of CT will remain ambiguous and confusing to students, who need to understand what it means in order to exhibit it in their writing, and to writing professionals and supervisors who are tasked to help students achieve it.

As an aside, I would like to mention a related and significant problem this terminological maze poses for researchers trying to locate CT literature in academic writing. We would experience great difficulty as I did since search engines do not index the various terms cited above as synonymous with CT, and unless the researcher is experienced in this area of research, they are unlikely to think to use the other terms to search for CT. Even then, because the relationship of the terms to CT in the existing academic writing literature has not been clearly established, the interpretation of CT can be prone to confusion. There is therefore a very clear need for a robust conceptualisation of CT to be developed for academic writing. Such a conceptual framework would provide the means for researchers to derive a more explicit interpretation of the notion of CT. As such, the first aim of my study (presented in Section 1.6), which is to derive an explicit understanding of CT for academic writing, will be achieved through the development of a conceptual framework for CT and its application to a set of authentic texts that were nominated as successful or less successful in their display of CT. This understanding will be used in Chapter 6 to interpret how the existing terminology discussed above can be interpreted.

1.3 Incomplete Conceptualisation of Critical Thinking in Academic Writing Literature

CT in existing academic writing literature has tended to be framed in the philosophical tradition by applied linguists (researchers belonging to the discipline within which this study is situated) although the conceptualisation of CT has its roots in the disciplines of philosophy and psychology (Kurfiss, 1988; Lewis & Smith, 1993; Sternberg, 1986). As such, the existing conceptualisation of CT can be considered incomplete.

The philosophical framing for CT is evident in the work of several researchers. In earlier works, this framing is seen in Ramanathan and Kaplan's (1996) critique of the effectiveness of channels in textbooks used to teach CT. One of the definitions they cite is based on an understanding of CT as cognitive skills that expose "how social reality works," and "how certain disparities between democratic principles and undemocratic realities are sustained and reinforced" (p. 228). Atkinson's (1997) argument of the tacit nature of CT, and the impossibility of expecting non-Anglophone learners to acquire it, challenges an interpretation of CT as cognitive skills analogous to Western traditions of logical, individualist, objective and detached knowing. His interpretation of CT is also anchored in a philosophical framing. More recent works that adopt this framing include I. Bruce (2014) who examines how CT is expressed in literature reviews. He interprets CT as cognitive skills, citing Bitchener's (2010) interpretation that CT "assesses or weighs up the value of theories, ideas, claims, research design, methods or conclusions" (Bitchener, 2010, p. 85). Kwan's (2006) and Kwan, Chan and Lim's (2012) interpretation of CT has a similar orientation to Bitchener's (2010) interpretation. Kwan (2006) interprets CT in terms of the student's ability to exhibit "counterclaiming" in the writing of literature reviews or as the researcher's practice of exposing "mistakes," "irregularities," "holes," or "curiosities" (p. 188) in established literature. Finally, Woodward-Kron (2002), in her study to understand what CT means, also adopts a philosophical framing where she interprets CT as cognitive skills that are be likened to the discourse practices of expert disciplinary writers. She explains that these practices include "critiquing established knowledge, developing an argument supported by evidence, and evaluating phenomena according to selected criteria" (pp. 122–123).

The one study of academic writing I have come across that adopts a conceptualisation of CT with roots in cognitive psychology is Richards (2000). In her study, Richards provides a model of how CT may be developed and expressed in the context of EAP writing instruction. She argues that CT is involved during the writing process and supports her claim using the work of cognitive writing theorists (e.g., Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; Tribble, 1996; White & Arndt, 1991). Specifically, she uses Bereiter and Scardamalia's model of writing to support the role of CT as processes such as querying, analysing and reflecting during writing which produce knowledge transformation. Unfortunately, Richards does not provide a clearer conceptualisation of CT processes nor does she explain how the processes operate, in Bereiter and Scardamalia's model, during the writing process. Further, although she defines CT at the start of her paper as a cognitive skill, she stops short of showing how these skills

relate to cognitive processes (described in her proposed model) to produce what she later terms "western-style critical analysis" (p. 93). She acknowledges that further research is required. Richard's (2002) conceptualisation of CT as cognitive processes has its roots in cognitive psychology and is congruent with her selection of a writing model from cognitive psychology, even though she does not elaborate how the processes work in the model. In short, she alludes to an interrelationship between the conceptualisation of CT as logical reasoning framed in philosophy and the conceptualisation of CT as problem solving framed in cognitive psychology, but does not develop the conceptualisation to show how the two are interrelated.

The existing conceptualisations of CT used by applied linguists leave us to question whether we should consider more than one conceptualisation of CT (rooted in philosophy or in cognitive science) in academic writing; if they are related; and, if so, how. To resolve this, and to build the much-needed robust conceptualisation of CT, it is necessary to turn to CT theorists to understand the relationship between the conceptualisations from the two traditions.

The next section will discuss this relationship as well as other issues CT theorists grapple with when trying to agree on a common conceptualisation. It provides further insight into the complexity associated with developing a conceptualisation of CT and why the existing understanding in academic writing remains incomplete and vague.

1.4 The Conceptual Complexity of Critical Thinking

CT theorists themselves consider the notion of CT a problematic one and refer to it as a "conceptual swamp" (Cuban, 1984; Bailin et al., 1999a, 1999b), suggesting the notion that is borrowed for application in academic writing is far more complex than it appears to be portrayed and interpreted in current academic writing literature. In this section, I introduce selected issues (relevant to my study) that have been the basis for contention among eminent CT theorists to highlight some of the differences in the existing conceptualisations of the CT construct that make conceptualising the notion in a different context (e.g., the academic-writing context) more challenging than it appears. These aspects of the CT conceptualisation will be covered in more detail in Chapters 2 and 3 where I argue, by drawing from both philosophy and cognitive psychology, for the core components of a CT construct that will be relevant in academic writing.

The first area of contention about the conceptualisation of CT is whether or not it should comprise the integration of philosophical and psychological notions of CT. Philosophers conceptualise CT as a form of reasoning that has grown through discourse and argumentation

using logical reasoning to promote the evaluation of claims, enabling thinkers to make judgements leading to decisions about what to believe (Beyer, 1995; Ennis, 1981, 1987; Paul, 1992; Siegel, 1988, 2010). Their conceptualisations are normative in nature and focus on standards and rigours of disciplined thinking. They emphasise standards of adequacy and accuracy of thought that are achieved through the application of the rules of formal and informal logic (Bailin et al., 1999a, Lewis & Smith, 1993; Sternberg, 1986).

Psychologists, however, theorise CT in terms of their behaviourist and experimental epistemic research traditions (Lewis & Smith, 1993; Sternberg, 1986). Their "process" conceptualisations focus on the performance of the thinkers during CT and purport to describe behaviours or actions of thinkers (Sternberg, 1986). While the philosophers' normative conceptualisations focus on illuminating standards for good thinking and on how judgements about good thinking can be made, psychologists concern themselves with "providing a window into" (Kurfiss, 1988, p. 25) the processes involved when thinkers make sense of experience or data to impose structure and construct meaning for drawing plausible conclusions in contexts of inquiry such as problem solving and decision making. In contrast to normative conceptualisations that involve reasoning that leads to judgements about what to believe, process conceptualisations involve reasoning that leads to judgements about what to do (Ennis, 1987).

Though theorists from the two traditions conceptualise CT differently, and some theorists such as Beyer (1985) insist that CT should remain the domain of philosophers, there has been a trend toward integrating both conceptualisations into one broader conceptualisation. Among the proponents of the broader conceptualisation are Ennis (1987), Facione (1984) and Kurfiss (1988). I further discuss the integration of the philosophical and psychological orientations in Chapter 3 where I argue for an integrated conceptualisation of a CT construct for academic writing.

Apart from the difference in the orientation used to conceptualise CT, theorists also differ in the labelling conventions and taxonomies used to explicate what is needed for the operation of CT. Bailin et al. (1999b) describe it as "a pervasive miasma of overlapping uses of terms such as skill, process, procedure, behaviour, mental operations etc" (p. 269). Typically, the term is used in the philosophical orientation to explicate the actions required for the promotion of CT. These skills could include those such as analysing arguments, detecting errors in reasoning (fallacies) and constructing convincing arguments, and have been used in foundational and

influential CT textbooks (see Bean, Ramage & Johnson, 2010; Browne & Keeley, 1986; Gage, 1987; Toulmin, Rieke, & Janik, 1984; Ruggiero, 1984). There are, however, still questions about what skills are relevant and how they are defined. A quick survey of some existing taxonomies such as the Cambridge Assessment (Blake, 2008), Ennis's (1991) latest version of taxonomy, Facione (1990) and Halpern (1998) are cases in point of the variation in both content and labelling across taxonomies. Examples of these taxonomies are found in Appendix 2.

In the psychological tradition, which has a process orientation, the terms used by theorists for labels that promote CT range from skills, steps, processes and actions. This can be seen from an example I use here from Sternberg (1986). He first labels three kinds of skills: meta-components, performance components and knowledge acquisition components, and then further subdivides each component into subprocesses using various labels such as steps, processes and actions, as in: meta-components (problem-solving steps such as deciding on steps, ordering steps), performance components (mental processes such as inferring, comparing, etc.) and knowledge acquisition components (actions such as screening, selecting, combining, comparing, relating information, etc.). Bailin et al.'s (1999b) critique on the issue of labelling shows how this form of labelling tends to be misleading. They convincingly point out that skills, actions and steps are performative labels which are visible in terms of their outcomes, while process labels remain unseen and without an exact connection to outcomes (Bailin et al., 1999b). This means alleged connections between outcomes and processes would tend to be quite arbitrary. The potential confusion caused by existing labelling conventions in CT literature can be seen in academic writing. Richards (2000), for example, discussed in Section 1.3, uses the terms processes and skills interchangeably without justifying how they are connected. She refers to CT as cognitive skills but describes those skills in terms of processes such as querying, analysing and reflecting. The confusion is compounded when the reader tries to work out how the underlying CT processes (described using a psychological orientation) in her proposed model link to the outcome of Western-style critical analysis (described using a philosophical orientation). I address the problem of labelling in an integrated conceptualisation in Chapter 2 (2.5) and explain the justification for the labels I adopt in my study in Chapter 3 (3.6).

Related to the issue of labels and taxonomies is the issue of a decontextualised skills approach to the acquisition of CT. This has also been the subject of debate, particularly by McPeck (1981, 1990) who questions the existence and transferability of generic skills, arguing that such knowledge is tacit and acquired through the pores "by osmosis" (Andrews, 2007, p.13) as part

of disciplinary knowledge. In the opposing camp are scholars like Ennis (1992, 1997) who advocates explicit instruction and argue for the generalisability of reasoning skills such as identifying fallacies and assumptions, and tracing relationships between premise and conclusion. This debate is typically referred to as the generalist versus specifist debate and has influenced the approach to CT instruction in the teaching and learning of disciplinary knowledge (e.g., Davies 2007, 2008; Moore, 2004, 2011a) as well as in academic-writing instruction (e.g., Andrews, 2007; Atkinson, 1997; Gieve, 1998; Hawkins, 1998; Kucan, 2011; Ramanathan & Kaplan, 1996; Turner & Bitchener, 2006) in higher education. My position with regards to this debate is discussed in Chapters 2 and 3 where, in developing a CT construct for academic writing, I argue that writing cannot be separated from content or disciplinary knowledge, where knowledge is socially constructed with writing as the principle means of displaying this knowledge (Hyland, 2000, 2004a; Kamler & Thomson, 2006; Richards, 2000) and where CT is required for successful writing that constructs this knowledge. I also cover issues related to the generalist versus specifist debate such as the issue of the situatedness of CT and the questions around its transferability, discreteness and teachability in relation to the academic-writing context.

1.5. The Present Study and its Proposed Outcomes

Both the non-negotiable requirement for students to display CT to achieve successful writing in higher education and the problems associated with an adequate conceptualisation of the notion, resulting in its existing inexplicitness in academic writing literature, clearly warrant the need for my study, which will provide a response to existing calls (Andrews, 2007; Lilis & Turner, 2001; Smith et al., 1999; Woodward-Kron, 2002) to make the notion of CT more explicit for instruction. Specifically, this study will develop a theoretical conceptualisation of CT which will be applied to the analysis of texts nominated successful and less successful in their display of CT , to derive an understanding of the nature and role of CT in academic writing.

The outcomes of the study will in turn facilitate academic writing professionals and supervisors to help students better understand and acquire CT, of which Smith et al. (1999) found undergraduate student writers lacked understanding, which Bitchener and Banda (2007) found postgraduate students writers had an "impoverished understanding of" (p. 61) and which Andrews (2007) argues is a problem that needs to be alleviated because students cannot be

expected to learn " by osmosis" (Andrews, 2007, p.13) – a notion that is so complex and unclear.

The potential impact of a better understanding of CT on students' writing could see a shift from some of the writing problems listed already in this chapter. This could include a shift from an uncritical serial listing of cited sources (C. Bruce, 1994; Cadman, 1997; Smith et al.,1999) to a more critical use which evaluates, interprets and applies sources to develop new arguments in constructed texts. Another outcome of a better understanding of CT could see a shift in students' apprehension at critiquing source materials, which currently includes the misconception of CT as solely "challenging" superiors, to a more balanced view of assessing the reader's position and understanding the state of knowledge in the literature in order to collegially articulate a suitable stance in the form of a positive or negative critique of that knowledge (Belcher, 1995; Qian & Krugly-Smolska, 2008; Samuelowicz, 1987). Additionally, a better understanding of CT could also help students recognise that their writing problems could relate to their lack of engagement in the thinking processes required for CT, rather than solely to language problems (Chang & Strauss, 2010).

A more comprehensive understanding of CT would empower writing professionals to better support students in the acquisition of CT for academic writing. This could include the ability to provide more explicit and concrete feedback such as what being critical means and how to be critical, rather than merely telling them to be more critical. Such an understanding would also empower writing professionals to discern the appropriate pedagogy for helping students acquire CT. For instance, professionals would recognise that using skills from well-recognised textbooks such as Cottrell (2011), Bean, Ramage and Johnson (2010), and Toulmin et al., 1984), in a decontextualised manner, would be of limited use because this form of pedagogy does not include the need to consider the knowledge of content and conventions of the discipline required for CT reasoning to construct texts.

The present study will identify the generic components of CT to develop a defensible construct that is recognisable in academic writing. The construct will be used to understand the nature of CT in academic writing and the role it plays in differentiating successful from less successful texts. It will be used also to show how existing terms and interpretations of CT discussed in Section 1.2 can be positioned and better understood within a more comprehensive framing of the notion of CT I argue for in academic writing. Finally, the understanding of CT derived from

this study will be used to discuss its implications for pedagogy to help writing professionals support their students' acquisition of the CT required for academic writing.

1.6 Research Objectives and Questions

1.6.1 Research objectives.

The research objectives of my study are:

    a. to derive an explicit understanding of CT in academic writing,

    b. to understand how CT contributes to successful writing.

1.6.2 Research questions[1].

My research questions are:

    1. What is the nature of CT in the genre of the doctoral thesis introduction?

    2. What role does CT play in differentiating successful from less successful writing?

1.7 Locating My Study

Given my research aim and that a study on CT can potentially span several fields and across several disciplines, I will now locate my study, defining the parameters within which it is undertaken.

Beyond the original interest generated among researchers in the disciplinary domains of cognitive psychology and philosophy of education, interest in CT research has expanded to other major fields which have the common objective of cultivating CT in students (e.g., Australian Council of Educational Research, 2001, cited in Jones, 2007; Dearing Report of National Committee of Inquiry into Higher Education in UK, 1997, cited in Richards, 2000; National Education Council [US], 1987 cited in Ramanathan & Kaplan, 1996). Among the most relevant examples of such fields in higher education research are Higher Education, TESOL and EAP. In Higher Education for example, the transferability and teachability of CT skills in the acquisition of disciplinary knowledge has been hotly debated by Tim Moore and Jim Davies (Davies, 2007, 2008; Moore, 2004, 2011a). In TESOL, one foci of researchers has been the tacit nature of CT as a form of "Western thought" and how (if at all possible) to teach something that defies definition to students from non-Anglophone communities (Atkinson,

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[1] A glossary of providing a brief definition of key terms used in this thesis is provided in page xv.

1997; Gieve, 1998; Hawkins, 1998). The focus of EAP researchers has been on using genre analysis to understand CT in academic writing and to use this information to provide more explicit information on how CT can be taught to students from non-Anglophone communities (I. Bruce, 2014; Kwan, 2012; Woodward-Kron 2002).

My study extends the interest and methodology of genre researchers in the field of EAP[2] who have aimed to acquire a better understanding of CT to empower students, supervisors and writing professionals to achieve the CT expectations of academic writing in their disciplines. So far, as discussed already, the existing conceptualisation of CT remains inadequate and CT is not only interpreted in various ways but also referred to with various labels. There has been, to the best of my knowledge, no other study that has attempted to conceptualise CT for the teaching of academic writing using the approach I will be adopting. My study addresses the gap of an inadequate conceptualisation of CT in academic writing research by leveraging on literature from CT and from writing theory to first develop a theoretical conceptualisation of CT, which is then used with an EAP strand of genre analysis to flesh out the nature and role of CT in a small sample of authentic texts.

The next section introduces the details of the approach I have adopted to answer my research questions.

1.8 Approach Adopted to Answer the Research Question

This section will introduce the approach selected for the present study by situating it among the approaches commonly adopted in the literature to study CT.

Interviewing academics and students is by far the most common approach adopted by researchers to understand what CT means. Atkinson (1997), however, argues in his seminal paper that because CT knowledge is "tacit" and "learned and practiced in a largely unconscious way" (p. 73), academics (whom he describes as typically considered masters of precise definitions) "seem almost as unwilling and unable to define critical thinking" (p. 74). He further adds that "they often appear to take the concept on faith, perhaps a sort of self-evident foundation of Western thought" (p. 74). In addition, he cites Fox's (1994) study that reports

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[2] The discourse community within which the present study is situated is the ESP/EAP community which is one of the branches or fields located within the larger disciplinary community of applied linguistics (Hyland & Shaw, 2016).

university professors as having difficulties defining CT in spite of the fact they confidently used the terms in assignments and were able to easily recognise it.

Interviews are hence typically accompanied by document analysis. In higher education, Jones (2007) has used it to compare how academics in history and economics understand what CT means. Moore (2011a) has used it to understand its meaning in the disciplines of philosophy, history and literary studies. Lovitts (2007) has used it to understand how examiners perceive CT expectations in theses.

Woodward-Kron's (2002) study in EAP has also used interviews and document analysis; however, she differs from the others by adopting a perspective of CT based on language and its social context. She does this by first obtaining an interpretation of what CT means through document analysis and interviews and then uses linguistic discourse analysis of texts to examine how CT is expressed in student writing. I. Bruce's (2014) study in EAP also uses a linguistic discourse analytic approach but his approach does not complement the linguistic approach with either interview or document analysis. Both Woodward-Kron and I. Bruce assume a philosophical orientation to CT.

My study, which sits in the field of EAP, also adopts a linguistic discourse analytic approach based on the use of language within a specific context. Unlike Woodward-Kron, who uses interviews and content analysis of documents with her linguistic analyses to obtain an understanding of CT in academic writing, I use literature from CT theorists and writing theorists to develop a defensible theoretical construct of CT, which guides my interpretation of the nature and role of CT in rhetorical and linguistic choices analysed in my text samples.

My study first sets out to identify the "core components" of CT as suggested by Bailin et al. (1999a), using the elements of existing conceptualisations of CT theorists introduced in Section 1.4. I then use the social-cognitive theory of writing (Flower, 1989, 1994) and genre theory (Miller, 1984; Swales, 1990) to flesh out and justify the existence of the core components of CT in academic writing. The resulting social-cognitive conceptualisation of CT in academic writing is viewed as the underlying thinking (cognition) that is shaped and evaluated by the genre norms (e.g., social norms of move structure, stance expression, citation use) of the community that produces and uses genres to sustain its work (Berkenkotter, Huckin, & Ackerman, 1988); Bruffee, 1986; Porter, 1986), the underlying thinking which determines the rhetorical success of texts through the textual decisions the writer makes during the construction of texts.

The conceptualisation that is considered context specific, as argued by CT theorists such as McPeck (1981) and Bailin et al. (1999a, 1999b), provides a means for us to recognise the occurrence of CT in academic writing, infer its operation and extrapolate the types of knowledge required for it. The conceptualisation is developed specifically to be operational for use in the context of academic-writing instruction and is used with genre analyses to infer the nature and role of CT in academic writing. It is used as a framework to interpret how CT contributes to differences and rhetorical consequences of selected genre choices in a small sample of texts comprising thesis introductions nominated exemplary (EX) and non-exemplary (NE) in their display of CT.

Woodward-Kron (2002) used a form of genre analysis derived from systemic functional grammar to examine how critical analysis and description functioned in student writing, while I. Bruce (2014) used move and lexico-grammatical analyses to understand how organisational and linguistic devices were used to express CT. My study employs a different method of genre analyses for each of the three genre features investigated. They are (1) move analysis for the study of move and move organisation, (2) lexico-grammatical analysis for the study of stance-taking devices and (3) intertextual analysis for the study of citations. This methodology is in line with genre analysis which comprises various methods from which the analyst selects the best (or a combination) that enables them to answer their research question (Tardy, 2011).

The procedure for the analysis of each of the selected features is covered in Chapter 4 (Sections 4.4.1–4.4.3). My method of genre analysis which applies the CT framework developed in this study also extends the existing use of genre analysis to the study of CT in texts.

1.9 The Contribution of the Present Study

My study contributes to academic writing research in general and to EAP research in particular, in several ways.

It addresses the problems of incompleteness and vagueness of the existing conceptualisations of CT that have made both the teaching and learning of the notion extremely difficult for writing professionals and students. The study provides a more complete conceptualisation of CT that integrates both the philosophical and psychological traditions, extending our existing understanding of CT in academic writing (discussed in Section 1.3) that is based largely on the philosophical tradition. The conceptualisation also incorporates an understanding of the

complexities of the notion that CT theorists grapple with (discussed in Section 1.4), and offers some understanding of how they can be addressed in a conceptualisation relevant for the academic-writing context. The theoretical construct of CT is presented in Chapters 2 and 3.

This conceptualisation, which is more explicit than existing interpretations, is able to clarify the confusion in the understanding of the existing notion of CT with its overlapping forms (discussed in Section 1.2) by providing a framework within which the labels can be differentiated and their meanings articulated more explicitly. The discussion of existing interpretations and forms in relation to the conceptualisation developed in this study is found in Section 8.3.

Additionally, the conceptualisation of CT which sheds light on the nature and role it plays in successful writing offers a model of how CT generates rhetorically effective decision making in texts. The model which facilitates the recognition of some of the facets of CT in academic writing and the reasoning involved in realising them can be used by writing professionals to design activities to help students acquire the CT required for academic writing, with the potential of helping them produce better quality texts. This understanding is likely to alleviate students' fears that CT is about challenging authorities in the discipline, by showing them how CT can be displayed in ways that are appropriate in their disciplines. The discussion on the nature and role of CT in academic writing, with its pedagogical implications, is covered in Chapter 8.4.

Finally, my study contributes to the methodology of genre analysis by providing a framework of CT that can be used with it to investigate CT in academic writing. This methodology is described in Section 4.1.2.

1.10 Thesis Structure

The argument in each of the chapters of the thesis, which contributes to the macro argument on the nature and role of CT in academic writing, is as follows:

Chapter 2 argues for the core components of CT using CT literature, covering the issues introduced in Section 1.4.

Chapter 3 argues for the occurrence and presence of the core components from the previous chapter in academic writing using academic writing literature. Together, Chapters 2 and 3 develop the theoretical construct of CT for the context of academic writing.

Chapter 4 argues for genre-based discourse analysis as a methodology for studying CT in texts. It shows how the theoretical framework developed in the earlier chapters informs the operation of CT in genre decisions to enable the analyst to infer differences in the operation of CT in exemplary and less exemplary texts.

Chapter 5 argues for the CT processes inferred in move choices that account for the difference in rhetorical effectiveness between exemplary (EX) and non-exemplary (NE) texts.

Chapter 6 argues for the CT processes inferred in citation choices that account for the difference in rhetorical effectiveness between exemplary (EX) and non-exemplary (NE) texts.

Chapter 7 argues for CT processes inferred in stance-taking choices that account for the difference in rhetorical effectiveness between exemplary (EX) and non-exemplary (NE) texts.

Chapter 8 argues for the facets, elements, thinking processes and knowledge that make up the nature of CT, the role it plays in successful writing and the pedagogical implications of the study.

Chapter 9 brings the thesis to a conclusion by highlighting the defining moments of my own acquisition of CT as a thesis writer, stating the contributions of the study, acknowledging its limitations and making suggestion for future research.

Chapter 2
The core elements and features of a critical-thinking construct

This chapter is the first of two which argues for the core elements that make up a CT construct in academic writing. It does so by drawing from relevant literature documented by eminent CT theorists, with an eye for achieving the research goal of the present study – to achieve an operational understanding of the nature and role of CT in academic writing.

The core elements are first identified and argued for before their features are discussed in relation to how they operate and the nature and types of knowledge required for their operation. A section comprising how relevant information about the construct developed informs pedagogy is included to provide the theoretical background for Chapter 8 that will discuss the pedagogical implications of the present study.

The elements of the CT construct discussed in this chapter will be further fleshed out in Chapter 3 using social-cognitive and genre-writing theories to argue for their occurrence and operation in academic writing. The conceptual/theoretical framework of CT will then be applied to a small sample of authentic texts that have been nominated EX and NE in their display of CT to investigate how CT contributes to successful academic writing.

This chapter is structured into four sections. The first two sections argue for the two core elements of CT: normative evaluation and problem solving. The third argues for an integration of the two elements in a construct for CT. Each of the first two sections is further subdivided into three subsections covering the operation of the core elements, the knowledge required for the operation and the principles that can be drawn from a knowledge of the construct to guide the design of pedagogy for the acquisition of CT required for academic writing. An additional section on labelling conventions used in this study is included for the purpose of maintaining the consistency and clarity of descriptions related to the operation of CT.

2.1 Introduction

Although there is to date a notable lack of consensus about the most adequate and efficacious definition for CT (Davies, 2006; Moore, 2004) among CT theorists (e.g., Ennis, 1987; Lipman, 1991; McPeck, 1981; Paul, 1982; Siegel, 1988), it is still possible to argue that an adequate conceptualisation can be constructed to serve a specific purpose or social interest. Gieve (1998), for instance, cites Ennis's (1987, 1992) notion of CT as satisfying his wish "to make

education a matter of accumulating decontextualized cognitive skills" (p. 124); Paul's (1990) notion as satisfying his goal of self-critical thinking as an educational project of self-emancipation; and Benesch's (1993) notion as cultivating CT as "an opportunity and a challenge for students to examine social structure with its inequalities and systems of power relations" (p. 547).

The conceptualisation of CT in the present study will serve the research purpose of providing a framework for interpreting how CT contributes to successful academic writing. This concurs with Meyers's (1986) argument that a basic framework is necessary for interpreting CT in a discipline i.e., "a structure for making sense of the materials and methodologies of the discipline being taught" (p. 6). While Meyers argues that CT is specific to a discipline, I argue that CT is also specific to academic writing and that the knowledge of disciplinary content and the conventions of how arguments are made in the discipline are required for applying CT in text construction. Apart from a research purpose, the conceptualisation of CT developed in the present study will also serve the social purpose of providing a perspective on an explicit understanding of the nature and role of CT in academic writing to help writing professionals and supervisors support students to achieve the CT requirements of successful academic writing.

The adequacy of the conceptual framework of CT developed as such will depend on the soundness of the theoretical foundation on which it is constructed, as well as on its explanatory potential to differentiate critical from less critical thinking in texts that are assessed as more or less successful in their display of CT.[3] I echo Bailin et al. (1999a) then that "it would be foolish to suggest that any given conception of critical thinking is the correct one" (p. 286).

The sections that follow introduce the "core elements" of the theoretical construct of CT through engagement with CT literature where there has been considerable variation in the language used in conceptualisations, the range of activities falling in the ambit of CT, the emphasis given to various aspects of CT and the kinds of activities relevant to learning to think critically (Bailin et al., 1999a). The sections argue for the legitimacy and operation of the elements of a CT construct that has the potential of distinguishing critical from uncritical thinking in academic writing, for the nature of the knowledge required for the operation of the

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[3] Though texts were nominated successful or less successful in their display of CT, the contributors were not asked for an explicit interpretation of CT since, as mentioned in Chapter 1, this knowledge is mostly tacit and in need of further study.

elements, for the interrelatedness of the elements and for the pedagogical conditions that can support their acquisition.

2.2 Normative Evaluation

The first core component of a CT construct I argue for is normative evaluation. "Evaluation" in this phrase suggests engaging in thinking that makes judgements and "normative" suggests making these judgements according to acceptable norms. These meanings in fact, as described in the Foundation for Critical Thinking's (n.d.-b) website, are incorporated in the etymological roots of the term "critical thinking" which is derived from two Greek words: "kriticos" (meaning discerning judgement) and "criterion" (meaning standards), implying the development of "discerning judgement based on standards."

The normative-evaluative aspect of CT stems from the Anglo-analytical philosophical tradition (Moore, 2011) and can be traced back to the writings of Socrates, Plato and Aristotle (Foundation for Critical Thinking, n.d.-a; Kurfiss, 1988; Lewis & Smith, 1993). Normative evaluation is achieved through logical reasoning that functions to evaluate propositional claims, enabling thinkers to make judgements leading to decisions about what to believe (Beyer, 1995; Ennis, 1984, 1987; Paul, 1990, 1992; Siegel, 1988, 2010). Siegel's (2010) argument that scholars in the philosophical tradition may differ in their accounts of CT but are agreed on its essentially normative nature, lends support to my claim that normative evaluation is a core element of CT.

The original form of logical or formal reasoning invented by Aristotle (Foundation for Critical Thinking, n.d.-a; Hillocks, 2010; Kurfiss, 1988) was syllogistic in nature and was used to construct arguments that were based on premises assumed to be absolute truths (such as in mathematics and sometimes physics). Formal logical reasoning soon gave way to informal logical reasoning, which was better suited for the construction of arguments for everyday problems and disputes. These problems were ill-defined, where premises and conclusions were probabilistic (probable rather than absolute). This form of reasoning, which is the focus of the present study, has been promoted in educational initiatives for the cultivation of rational and logical thought leading thinkers to arrive at better reasoned conclusions about propositional claims or arguments (Siegel, 2010).

The normative-evaluative component of CT is inherent in most common definitions of CT rooted in the philosophical tradition (Bailin et al., 1999a; Beyer, 1995; Facione, 1990; Lipman, 1988; Paul, 1992) where CT is described as "logical" or "good" thinking that leads to "sound

judgement" about what to believe. Lipman (1988), for example, defines CT as "skilful and responsible thinking that facilitates good judgement" and provides criteria such as "self-correction" and "sensitivity to context" (p. 39) for achieving it. Underlying this definition is the assumption that CT facilitates sound judgement and this thinking or reasoning is based on some standard or criteria for good reasoning. The same assumption of criteria or standards considered in reasoning that leads to sound judgement is inherent in Facione's (1990) consensus study, which provides the criteria for arriving at good judgement. The study defines CT as "purposeful self-regulatory judgement" arrived at by using explanation involving "evidential, conceptual, methodological, criteriological considerations" (p. 3) that led to it. Normative evaluation is also explicitly implied in Bailin et al. (1999b), who describe CT as judgements meeting "standards of adequacy and accuracy" (p. 287), and Beyer (1995) who describes CT as a "means of making reasoned judgements" (p. 8) where disciplined thinking is used to assess the validity of something (statements, news, stories, arguments, research, etc.). Paul's (1992) definition of CT, which refers to thinking in the discipline, also clearly implies a normative-evaluative component as well. He defines CT as "perfections of thinking exemplified through self-direction and discipline and appropriate for a particular mode or domain of thought" (p. 10) where thinking, according to him, is adjusted to the logical demands of a type or mode of thought and conforms to "intellectual standards and values that underlie rational learning" (p. 9).

The inherent normative-evaluative attribute in CT can also be gleaned from descriptions articulating the qualities of a critical thinker. Siegel (1988) describes a critical thinker as someone with a "critical spirit" or "healthy scepticism" (p. 142) who values good reasoning and its fruits, seeks reasons, assesses them and governs beliefs and actions in accordance with results of such assessment. The outcomes of such thinking are clarity, precision, specificity, accuracy, elegance, consistency, logic, depth, completeness, significance, fairness and adequacy (Lewis & Smith, 1993; Paul, 1992). In the American Philosophical Association's consensus study, a person who exhibits "purposeful self-regulatory judgement," arrived at by using explanation as defined above (Facione, 1990), is considered an ideal or model critical thinker.

2.2.1 Operation of normative evaluation in critical thinking.

Normative evaluation operates in CT through logical reasoning. This evaluation functions to enable the thinker to make judgements about what to believe by differentiating "superficial, careless, rash and naïve" (Bailin et al., 1999a, p. 287) from disciplined and well-thought

reasoning. It is the kind of thinking that, according to Siegel (2010), is fundamental to what CT education seeks to foster:

> to inculcate in students the ability to reason well i.e., to construct and evaluate the various arguments and reasons/premises and inferences of which they are composed which have been or can be offered in support or criticism of candidate beliefs, judgements and actions… [and] the disposition or inclination to be guided by reasons so evaluated that is actually to believe, judge and act in accordance with the results of such reasoned evaluations. (p. 142)

The operation of normative evaluation through logical or "good" reasoning can be depicted through Toulmin's (1958/2003) probability argument schema, which has, in the past 2 to 3 decades, been used in discourse studies in colleges and universities (Andrews, 2007; Hillocks, 2010) to promote CT in academic writing. The schema enables thinkers to recognise and construct arguments that exhibit good reasoning by enabling them to track the "train of reasoning" (Kurfiss, 1988, p. 13) that links claims and supporting reasons to a position made in an argument. The six elements of the schema held in logical relationship are shown in Figure 2.1.
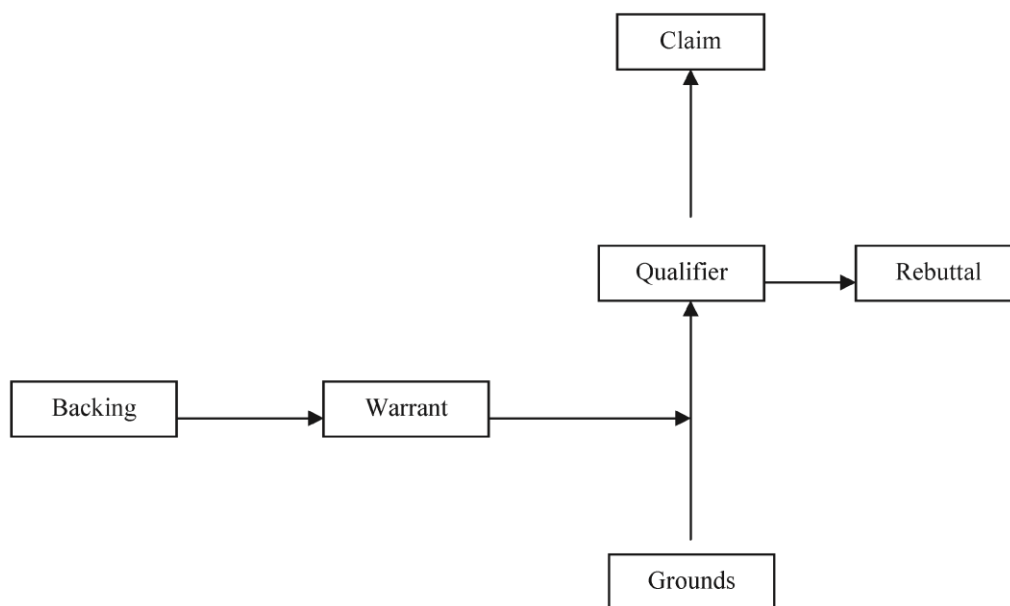
Figure 2.1. Toulmin's model (Toulmin et al., 1984).

The first element of the schema is the claim (also referred to as conclusion or thesis), which is held in logical relationship to the evidence (data or grounds) required to support it. In a research paper for example, the findings segment provides the grounds or evidence for the claims made in the research undertaken. This relationship between the claim and evidence is warranted by

"common sense rules that people accept to be generally true, scientific principles or studies, and thoughtfully argued definitions" (Hillocks, 2010, p. 26) or means by which the evidence or grounds may be connected to the proposition or claims in the arguments (Andrews, 2007). In the case of a research study, the research design (methodology) provides the warrant or the scientific principles on which the strength of the purported relationship between the evidence and claim is assessed. Since warrants can be challenged, they need to be backed by studies, which, in the case of the research paper, is the literature that provides the theoretical underpinning, parameters and paradigms within which new discoveries are to be judged (Andrews, 2007) or which provides "the ballast to set the empirical data and its analysis in context" (p. 7).

The final two elements of the schema, which are qualifier and rebuttal, are required because of the probabilistic nature of the claims made. The claim is modified with a qualifier to moderate its force or strength using words such as "probably," "very likely," "almost certainly" and the like. Also, since arguments of probability suggest the existence of alternative or differing claims, the rebuttal or counterarguments allow the critical thinker to consider alternative views and to anticipate doubts the reader may have and to pre-empt the objections of a sceptical reader. The counterargument shows that the thinker has considered the conditions under which the warrant may not hold true. This supports the model of a critical thinker as someone who weighs alternatives before arguing for one (Harvey, 1999).

We can extrapolate from the schema that when normative evaluation is exercised, the critical thinker assesses the logical relationships of the elements held in the argument schema through a series of critical questions (Shepelak, Curry-Jackson, & Moore, 1992); and these include whether the kinds of evidence selected support the claim, whether assumptions or warrants defend the relationship between the evidence and claim, whether backing exists to justify warrants, whether the backing can be challenged, whether alternative views are addressed in the argument, and whether the force of the claim is appropriately qualified.

Normative evaluation is also exercised in the construction of the probability argument. In constructing the argument, it can be extrapolated that the thinker evaluates the appropriacy of evidence before selecting it to use as support for the claim being made; carefully examines and considers the kinds of warrants that can support the relationship purported between the claim and evidence; justifies warrants through the identification of relevant backing; anticipates alternative opposing views, by providing counterarguments; and judges the force to assign the

claims being made. Normative evaluation in CT during argument analysis and construction can be construed to include a combination of mental processes such assessing, questioning, evaluating, selecting, examining, anticipating, justifying and judging. Some form of these processes can be located in the sampling of taxonomies from the literature which are presented in Appendix 2. It will not take long to realise that there is an apparent lack of consensus among theorists about the skills to include within a CT taxonomy, as highlighted in Bailin et al. (1999b). I would argue that this lack of consensus can be expected since CT theorists differ in their conceptualisations of CT (alluded to in Chapter 1). As such, the mental processes extrapolated in the present study are specific to the conceptualisation and operation of CT during text construction in academic writing.

The episodes of the operation of normative evaluation in academic writing are covered in Section 3.5.

2.2.2 Knowledge required for the operation of normative evaluation.

The basic knowledge required for the operation of normative evaluation includes knowledge for analysing and constructing probability arguments. This covers knowledge of the elements of a probability argument and an understanding of the reasoning behind the logical relationships they are held in (discussed in the previous section). Such knowledge is considered to be generic in nature and found to be common across several disciplines (Toulmin,1958/2003). As such Toulmin's findings lend support to the generalists' (Ennis, 1992; Facione, 1990) view that knowledge and skills pertaining to CT are discrete, transferrable and generic.

Toulmin's findings, however, do not stop at generic knowledge. He found also that for arguments to be effectively evaluated, they had to be evaluated against standards relevant to the context in which they are made i.e., against "whatever sort of cogency or well-foundedness can relevantly be asked for in that field" (Kurfiss, 1988, p. 20), making the knowledge required for CT to also be context specific, non-discrete and non-transferrable in nature. This lends support to the specifists' (Atkinson, 1997; Clinchy, 1994; McPeck, 1992) view that context-specific knowledge is required for the operation of normative evaluation in CT. This study takes the position then that CT requires both generic as well as context-specific knowledge.

Several types of context-specific knowledge are required for the operation of normative evaluation. For instance, to evaluate the appropriacy of grounds for claims, the critical thinker must be familiar with the types of evidence considered suitable for making claims in the

discipline. In addition, critical thinkers would also need to be familiar with the content of literature and the theories related to the research topic to be able to justify warrants that support the relationship between claim and grounds. According to Bailin et al. (1999a), what cognitive scientists term declarative or background knowledge (related to facts and concepts in a field of inquiry) includes content knowledge related to the field of inquiry as well as other types of background knowledge such as knowledge of concepts (e.g., elements of argument structure), beliefs, values and practices relevant to reasoning in the context of use (Bailin et al., 1999a). These can be further broken down to include knowledge of standards for deliberation and argumentation, standards for making judgements about relevance of data selected, the credibility of sources, the validity of evidence, the appropriacy of backing for warrants and so on (Toulmin, 1958/2003; Toulmin et al., 1984), and principles to guide procedures or inquiries such as methodological principles.

Knowledge also includes what cognitive scientists refer to as procedural knowledge (Bransford et al. 1986; Perfetto, Bransford, & Frans, 1983; Simon, 1980). This knowledge involves operational knowledge about when and how to use the relevant background knowledge (Loacker, Cromwell, Fey, & Rutherford, 1984, cited in Kurfiss, 1988) and is typically described as "what a person can do" (Anderson, 1985; Greeno, 1980). Examples of this knowledge required for operating in normative evaluation include knowledge of how to evaluate arguments using relevant criteria and standards in a discipline, knowledge of how to apply procedures to assess the methodological rigour of research approaches that provide warrants for claims, and knowledge of how to apply standards governing inquiry and justification in specialised areas, among others (Bailin et al., 1999a).

Some categories of knowledge required for normative evaluation are summarised in Table 2.1.

Table 2.1

Some Categories of Knowledge Required for Operating in Normative Evaluation

Declarative knowledge (background knowledge)	Examples	Procedural knowledge (what a person can do)	Examples
Content and context-specific knowledge:	Standards of deliberation and argumentation for making judgements about arguments such as:	Knowledge about when and how to use content and context-specific knowledge	Ability to: determine adequacy of supporting evidence
knowledge of concepts, values, beliefs and practices relevant to reasoning in the discipline	recognising the types of evidence considered suitable for supporting claims in the discipline. identifying warrants and locating the backing for arguments in the discipline		identify warrants or assumptions that link supporting evidence to a claim establish backing for warrants
knowledge of methods of inquiry in the discipline	applying methods of inquiry related to how claims were reached		identify opposing views and present counterarguments determine the validity of inquiry methods used to arrive at claims
Generic concepts:		How to analyse/construct arguments	Ability to:
knowledge of elements of arguments and how they are held in logical relationships	identifying nature of logical relationships that hold claim, ground, warrant, backing, modifier and counterargument		identify elements in an argument and evaluate the logical relationship between elements

According to Greeno (1980), the knowledge and how it is applied to CT reasoning is largely tacit because it is embedded in the disciplinary context. A critical thinker who is able to successfully operate in CT is able to engage in norm-regulated practices by applying a set of background knowledge and procedural operations for making reasonable judgements in specific contexts (Bailin et al., 1999a, 1999b).

2.2.3 The embedded and tacit nature of normative evaluation: Implications for its acquisition.

Associated with the nature of CT as a cognitive activity embedded in a disciplinary context, and the tacit knowledge required for its operation (discussed in the previous section), is the question of how it is theorised to be acquired. While the acquisition of generic knowledge associated with normative evaluation is promoted as a list of explicit logical operations by users of influential textbooks, such as Browne and Keeley (1998), Toulmin et al. (1984), Gage (1987), Bean, Ramage and Johnson (2010), and Ruggiero (1984), this knowledge is insufficient

for the successful operation of normative evaluation. This is because unless the list of operations is applied to the analysis and construction of arguments within a specific context of use such as a disciplinary context, the approach does not promote the acquisition of the largely tacit aspects of domain-specific knowledge required for the operation of CT.

Cognitive scientists (Bailin et al., 1999a, 1999b; Kurfiss, 1988) recommend that argument-analysis skills such as analysing arguments, detecting errors in reasoning (fallacies) and constructing convincing arguments be applied to tasks that are worked out within a specific context. This way, learners can be oriented to engage in both generic and context-specific knowledge required for the operation of normative evaluation rather than be expected to transfer generic skills they are introduced to into a separate context of use. Halpern (1998) suggests introducing tasks requiring judgement and thinking that either fulfil or fail to fulfil standards of good thinking by positioning learners in an appropriate context to acquire what Scheffler (1965) describes as "the relevant knowledge, commitment and strategies by coming to understand what criteria and standards are relevant" (p. 103, cited in Bailin et al., 1999b) for making strategic judgements that lead to successful operation. Halpern suggests this includes tasks leading to understanding how cause is determined, recognising and criticising assumptions, giving reasons to support conclusions and the like.

A second condition theorised by cognitive scientists for the acquisition of knowledge that is embedded and tacit in nature is making thinking explicit through cognitive modelling (Collins, Brown, & Newman, 1986). In this approach, experts articulate their reasoning aloud for novices to help them identify the contextual basis or standards of good thinking that lead to evaluations about arguments, statements of belief and hypotheses about conclusions. The approach allows novices to observe experts who "act" in a principled manner so that reasoning that either fulfils or fails to fulfil relevant standards of thinking is exposed (Wright, 1993). It exposes some of the knowledge (discussed in Section 2.2.2) such as knowledge of criteria for standards of evaluation in a discipline which includes knowledge of methodological procedures applied in arriving at claims, knowledge of supporting details that can be considered relevant for justifying claims and knowledge of the types of backing that can provide warrants for the purported relationship between the evidence and the claim made.

By complementing the positioning of students within specific contexts of use and making thinking visible with the provision of frequent feedback and evaluation according to clear criteria, learners are assured that the quality of reasoning practices they acquire is based upon

"rational principles, upon insights into facts and their meaning" rather than on practices which "simply [fix] incorrect acts into wrong habits" (Dewey, 1964, p. 201).

As the process involved in acquiring knowledge required for cultivating competence in CT is complex, learning tasks are usually calibrated to match the learner's current level of knowledge. If the above three conditions for the acquisition of CT knowledge and skills are present in a learning environment, performative competence is likely to be promoted. This means learners would be able to apply relevant background and procedural knowledge to make reasoned judgements in a specific context by engaging in norm related practices.

The list of CT skills to include in the design of learning tasks for cultivating argument analysis and construction can be obtained from various taxonomies such as those developed by Ennis (1987, 1991), Beyer (1985), and Facione (1990). Skills in a taxonomy can include a list such as: clarifying issues and terms, identifying components of arguments, judging the credibility of evidence, using inductive and deductive reasoning, handling argument fallacies and making value judgements (Ennis, 1987). Since (as mentioned in Section 2.2.1) CT taxonomies are likely to differ in the skills required for normative evaluation, relevant skills from various taxonomies can be selected and combined according to how CT is defined and how these skills may be profitable for helping learners achieve the ability to assess and engage in sound reasoning in the target context of use.

2.3 Problem Solving

The second core component of a CT construct I argue for is problem solving. This component relates to how psychologists theorise the conceptualisation of CT. Unlike philosophers, psychologists theorise CT in terms of their behaviourist and experimental epistemic research traditions (Lewis & Smith, 1993; Sternberg, 1986).

This means psychologists, in their conceptualisation of CT, concern themselves with "providing a window into" the processes involved when thinkers make sense of experience or data to impose structure and construct meaning for drawing plausible conclusions in contexts of inquiry such as problem solving and decision making (Kurfiss, 1988, p. 25). The process conceptualisation of psychologists hence focuses on the performance of thinkers during CT and purports to describe the mental behaviours or actions of thinkers (Sternberg, 1986). In contrast to the normative-evaluative conceptualisation of philosophers, who seek to illuminate standards of good thinking that lead thinkers to make judgements about "truth" asserted in claims resulting in decisions about what to believe, process conceptualisations involve

illuminating reasoning processes that lead thinkers to the claims or conclusions that philosophers evaluate. This explains Facione's (1984) conceptualisation of CT as reasoning required for both deciding what to believe as well as deciding what to do.

The contexts of problem solving where CT is purported to operate, in process conceptualisations of CT, draw on studies on ill-defined-problem solving (Halpern, 1998; Kurfiss, 1988), typical of, but not confined to, disciplines like the social sciences and humanities to which this study belongs. Cognitive scientists (Halpern, 1998) argue that ill-defined problems in which CT operates are complex problems requiring higher order thinking processes such as judgement, analysis and synthesis rather than well-defined problems, which can be solved by rote or mechanical application of well-learned rules, with little concern for context or other variables that would affect the outcomes, solutions or conclusions drawn. This means ill-defined problems could present multiple plausible solutions as opposed to well-defined problems occurring in disciplines like mathematics and physics, which present single and fixed solutions.

Because conclusions or solutions associated with ill-defined-problem solving are not only multiple but also plausible, rather than single and certain (i.e., conclusions purport to account for all the available data), the claims or propositions arrived at from the problem-solving process must be supported with appropriate reasoning and evidence (Voss, Greene, Post & Penner, 1983). The link between the CT reasoning required to solve an ill-defined problem, and the reasoning needed to justify the solution reached, supports the position of theorists such as Kurfiss (1988), Ennis (1987) and Facione (1984) who argue that the problem solving and normative-evaluative components of CT are interrelated. This interrelationship between the two components is described by Kurfiss (1988) in terms of two phases: problem solving as the creative phase of CT, where data is reviewed and interpreted to solve problems; and normative evaluation as the evaluative phase of CT, where solutions or conclusions derived through problem solving are justified. Kurfiss's terms "context of discovery" and the "context of justification," which she describes as "two sides of the same CT coin" (p. 2) aptly describe the interrelated nature of the two components of CT. The position I take on the interrelationship between the two components is discussed in Section 2.4.

A common denominator in CT definitions that focus on ill-defined-problem solving is the reference to thinking processes or acts of performance (actions or what people do) used to solve problems. Scholars in the psychological tradition include Halpern (1998), Sternberg (1986) and

Willingham (2007), to name a few. Sternberg (1986) refers to CT as "mental processes, strategies and representations" (p. 3) used to solve problems, make decisions and learn new concepts. Halpern (1998) refers to CT as "cognitive skills or strategies" (p. 450) to increase the probability of a desirable outcome. "Outcome" here refers to the proposed solution reached in an ill-defined-problem solving context. Willingham's (2007) definition of CT refers to thinking processes as "mental procedures" (p. 14). He integrates normative evaluation and problem solving, defining CT as performative acts such as "seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems and so forth" (p. 8).

2.3.1 Operation of problem solving in CT.

A problem state is identified by Hayes (1981) as a situation where a gap exists between a current state (where you are) and a target state (where you want to be), and a solution as the means of addressing the gap by finding an appropriate way to reach the target state. A commonly used framework for solving problems in the social sciences is Voss, Greene, et al.'s (1983) five-part problem-solving model. The five parts are: task environment (statement of the problem; context and conditions in which it is found), problem space (information that may be useful to solving the problem such as problem goals and subgoals to reach the solution; actions or operators that can enable solver to reach the solution; knowledge of constraints under which problem has to be solved), problem representation (accurate representation of the problem to be solved), problem-solution activity (actions taken toward goal) and evaluation (means-end analysis to determine if previous actions have achieved the target goal). This framework corresponds to three steps in Hayes's (1981) model which is applied to solving writing problems. The three steps comprise the representation of a problem (find the problem; represent the problem), the execution of a solution (plan the solution; execute the solution) and the evaluation of the solution (assess how good the result is). Both models inform the description of the operation of problem solving in CT used in the present study. The problem-solving steps derived from the two models include: representation of the task, comprising information about task environment and problem space; execution of the solution, comprising the actions taken toward the achieving the solution goal; and evaluation, comprising the assessment of the solution achieved. This framework is used in Section 3. 2 to show how problems specific to academic writing are solved.

In general, the initial problem-solving step, which requires information gathering to create a problem representation, involves differentiating relevant from irrelevant information (Hayes, 1981) to create an accurate representation of the problem. Differentiating information requires interpreting the problem statement and conditions or context (task environment) in which the problem is found. It also involves identifying relevant information for the solver to create goals or subgoals to execute actions or operations, which can help them move toward a solution state, and for the solver to identify constraints under which a problem is to be solved (problem space). In academic writing, the problem statement could, for instance, be to construct the introduction subgenre of a PhD thesis and the context in which the problem is found could be within the discipline of applied linguistics in the Faculty of Education. Information on the subgenre of the introduction within applied linguistics and the norms and conventions of this genre within this sociocultural context of the discipline would provide the constraints within which the genre is to be constructed, the types of goals and subgoals that can be set to achieve the construction of the target subgenre and the considerations to be made in executing the operation of decision making to achieve the goals.

The next step toward the execution of a problem solution includes problem-solving strategies such as decomposition or breaking down a problem into subproblems. In the case of text construction, for example, the construction of a chapter involves breaking the chapter into smaller divisions (sections or subsections) and then each subsection into paragraphs which finally focus on sentence-level decisions or operations that contribute to the solutions that construct the whole chapter. A worked example of the steps in problem solving as applied to academic writing is provided in Chapter 3 (Table 3.1).

The final step in problem solving is evaluation. Solving a problem is assumed to take place via means-ends analysis (Hayes, 1981; Voss, Greene, et al., 1983). This means that the problem solver modifies their operator or action (the action in the example above is decision making) until they achieve their goals (effective decisions that contribute to the construction of the genre in question). Evaluation plays a critical role in helping the solver determine when their problem has been solved. Evaluation, which is a necessary step in problem solving, is required to assess the effectiveness of solutions. It is referred to as the "context of justification" and argued to be interrelated to the "context of discovery" (Kurfiss, 1988, p. 2). The justification process involves constructing an argument to justify the solution or decision reached at the end of problem solving. The interrelationship between normative evaluation (the evaluation of the argument) and problem solving (process involved in solving a problem and constructing an

argument to support the effectiveness of the solution) has been recognised by theorists such as Ennis (1987), Facione (1984) and Halpern (1998).

It can be extrapolated from the problem-solving steps of CT discussed above that some of the mental processes involved in problem solving include differentiating, interpreting, identifying, decomposing and evaluating. As was the case for the mental processes extrapolated for the operation of CT in normative evaluation, some form of these mental processes can be located in the sampling of existing CT taxonomies presented in Appendix 2.

2.3.2 Knowledge required for operating in problem solving.

As was the case with the normative-evaluative component of CT, the knowledge required for operating in the problem-solving component comprises both generic and context-specific knowledge. Cognitive scientists argue for both categories of knowledge based on evidence of differences in problem-solving reasoning exhibited by expert and novice problem solvers (Kurfiss, 1988). They argue firstly that some of the declarative knowledge (content knowledge related to the field of enquiry as well as other types of background knowledge such as knowledge of concepts, values, beliefs and practices relevant to reasoning in the context of use) required for problem-solving, is embedded in the context of a discipline. This is based on data that shows that the depth and understanding of content knowledge (knowledge associated with how knowledge in a discipline is structured) possessed by experts differentiates how they represent and solve problems from novices who possess less domain knowledge (Willingham, 2007).

Secondly, they argue that the procedural knowledge or operational knowledge (knowledge about when and how to use the relevant background knowledge) required to solve context-specific problems is tacit, based on data that shows expert problem solvers use a different "code" in different contexts and this code differs from that used by novices. It follows therefore that they also argue the knowledge required for problem-solving reasoning (declarative and procedural) must be acquired in the context of a discipline. The generic and context-specific nature of the knowledge required for the problem-solving component of CT concurs with the nature of knowledge required for the normative-evaluative component of CT (discussed in Section 2.2.2), and makes it a social-cognitive construct.

Domain knowledge contributes to effective problem solving. Data from problem solving in physics shows that a lack of understanding of scientific principles associated with the knowledge of the discipline results in novices representing problems in terms of superficial

features rather than in terms of laws or principles needed to solve them (Chi, Feltovich, & Glaser, 1981; Larkin & Reif, 1979). In political science, content knowledge contributes to experts using more abstract categories to identify causes of problems than novices (Voss, Green, et al., 1983; Voss, Tyler, & Yengo, 1983). Willingham (2007) has found that in scientific reasoning in general, domain knowledge contributes to the expert's ability to hypothesise the kind of factors to investigate in problem solving. In composition studies, Hayes (1981) also found that knowledge of problem types and knowledge of concepts in a specialist field is required for task representation. Knowledge of audience, expectations of writer purpose, persona and role contribute to the representation of the problem to be solved. Flower and Hayes (1980b) have observed that expert writers factor considerations such as their audience, presentation of self, their aims and their texts into their problem representation, while novice writers focus primarily on their topic, not paying much attention solving the problem of communicating to their audience. Knowledge of the constructivist nature of arguments in the social sciences also contributes to how problems encountered during text construction are solved. In this respect, Flower and Hayes's (1980) findings show that experts make extensive changes during the revision or review stage of problem solving, since they view the text as a hypothesis rather than a finalised solution. Novices, on the other hand, view texts as a solution, making only superficial or surface changes (e.g., grammar, spelling) during this stage.

Apart from differences in declarative knowledge, expert problem solvers also possess tacit operational knowledge that allows them to solve problems more effectively than novices. As mentioned in Section 2.2.2, declarative knowledge remains knowledge unless problem solvers also have the necessary procedural knowledge to use it. Because the range of problem tasks can extend from tasks involving anything from interpreting texts, constructing texts, designing or evaluating experiments, weighing the merits of a proposal in a discipline to decomposing software problems to write computer programs, problem solvers need to possess a different operational code to know when and how to use background knowledge (Loacker et al., 1984, cited in Kurfiss, 1988). The various operational codes are tacit and unique to their context of use, since the operation of problem solving in CT is used to achieve different outcomes.

In history and art history, for example, the code involves supplementing historical knowledge with procedural knowledge necessary to decode texts or images and integrate visual and historical evidence (Moore, 2011). In literary studies, for example, the code involves drawing on certain conceptual categories (e.g., validity, persuasiveness) to fashion an original interpretation (Moore, 2011). The presentation of solutions to research problems in written

form requires yet another set of codes to solve the writing problem (Flower, 1993). When writers construct texts to represent their solutions to research problems, this code would involve, among other things, knowledge of how to transform source texts to fit the construction of the developing argument of a text (Flower et al., 1990; Scardamalia & Bereiter, 1991; Spivey, 1990), how to take the appropriate stance to persuade readers (Hyland, 2005b, 2008), and how to configure a text using moves to achieve its rhetorical purpose (Swales, 1990). CT required for problem solving in academic writing is the focus of this study.

Table 2.2 presents the categories of knowledge required for operating in problem solving. The categories displayed in this table are similar to those represented in Table 2.1 for normative evaluation. Knowledge required for operating in CT as problem solving includes declarative and procedural knowledge, which are either context specific or generic in nature. Though some aspects of knowledge are explicit such as the heuristics (steps) for problem solving, much of the other knowledge is "implicit, tacit, taken-for-granted thought processes that an expert uses without conscious attention" (Kurfiss, 1988, p. 40).

Table 2.2

Some Categories of Knowledge Required for Operating in Problem Solving

Declarative knowledge (background knowledge)	Examples	Procedural knowledge (what a person can do)	Examples
Content and context-specific knowledge: knowledge of concepts, values, beliefs and practices relevant to reasoning in the context of use	Standards of problem solving such as: identifying the types of information to consider from the problem space in a discipline to solve a problem (e.g., genre features, expectations of audience, relevant knowledge about the research topic)	Knowledge about when and how to use content and context-specific knowledge	Ability to: create an appropriate task representation generate relevant goals from the representation to solve the problem Identify constraints within which the problem needs to be solved Generate actions that can enable the solver to achieve a solution
Generic concepts: knowledge of the steps required for solving a problem and what the steps involve	awareness of the steps of problem solving such as representing a task adequately, executing an effective solution, evaluating the solution and consolidating the learning from the process	Knowledge of when and how to use problem-solving steps	Ability to: construct task representation generate relevant goals to solve a problem

2.3.3 Designing activities for the acquisition of problem-solving knowledge.

The three conditions suggested for the acquisition of knowledge and skills required for operating in normative evaluation apply for the acquisition of problem solving, since knowledge required for their operation is embedded and tacit in nature.

Activities for cultivating generic problem-solving steps (Hayes, 1981; Voss, Greene, et al., 1983) need to be embedded in the context in which the problem is situated to facilitate context-specific problem solving. In addition to embedding activities, problem-solving reasoning should be made visible though modelling. Cognitive scientists suggest providing novices with multiple examples and practice of the types of problems they are likely to encounter, with the provision of explicit feedback that explains the rationale for comments made. They label the approach that fulfils these pedagogical conditions as "cognitive apprenticeship" (Collins et al., 1986). The components of the approach include modelling (demonstrating a cognitive task so novices can observe it), coaching (assisting the novice during learning or performance of a task), scaffolding (providing expert guidance initially and gradually removing it), articulating (reasoning processes and knowledge in use), reflecting (comparing novices' problem-solving process with those of an expert), and exploring (encouraging students to establish goals or subgoals within a given task; Kurfiss, 1988).

The list of problem-solving actions or behaviours to include in the design of learning tasks for cultivating problem solving can be obtained from various taxonomies such as Hayes's (1981); adapted from Newell and Simon (1972) and Voss, Greene, et al. (1983) for problem-solving steps (e.g., construct task environment, problem space, problem representation etc.); Halpern (1998) for problem-solving skills (e.g., understanding how cause is determined, recognising and criticising assumptions, analysing means-goals relations etc.); and Bailin et al. (1999b) for mental processes (e.g., classifying, inferring, observing, evaluating, synthesising and hypothesising), among others.

In line with what was mentioned in Section 2.2.3 about the skills for normative evaluation, the processes for problem solving reflected in various taxonomies are also likely to differ from one another. As such, the selection of relevant processes from various taxonomies to include in the design of activities can be decided according to how CT is defined and how these processes may be profitably used to help learners acquire the reasoning required for problem solving in the target context of use.

2.4 The Interrelationship Between Normative Evaluation and Problem Solving

I have argued in this chapter that CT comprises two core elements: normative evaluation and problem solving. I have also posited how each element operates to produce CT with the types of knowledge that can facilitate their operation. In this final section, I argue the position that the components of normative evaluation and problem solving are interrelated operations in the CT construct developed in this chapter. This is essentially because both components of CT are required for solving complex problems which are ill-defined and messy.

The outcome or solution that results from the operation of problem-solving reasoning is synonymous with the conclusion or claim argued for in a constructed argument. On the one hand, problem-solving reasoning provides solutions to problems (Newell & Simon, 1972; Voss, Tyler, & Yengo, 1983). On the other hand, the solutions to these problems need to be evaluated since the problems are ill-defined and messy resulting in multiple solutions (more than one outcome) that are probable rather than absolute (Kurfiss, 1988; Voss, Greene, et al., 1983).

The outcomes of problems are evaluated through normative evaluation, which assesses the quality of reasoning that resulted in these outcomes. This aspect of normative evaluation, which evaluates the problem-solving reasoning that led to outcomes and enables a thinker to make judgements about what to do (e.g., what stance choice to make during text construction, what car to buy, what taxes to impose to recover the cost of building new roads), is non-epistemic evaluation. It is synonymous with the last step of problem solving, which evaluates the efficacy of solutions. Normative evaluation is also required to evaluate arguments that defend the claims constructed about solutions to problems (e.g., stance choice q is the best solution to the problem of what stance to make at point k during text construction; the car model g is the best choice for the conditions presented in the situation in question; imposing taxes on p is the best method to recover the cost of building roads for the conditions present in the problem situation). This aspect of normative evaluation, which evaluates the logical reasoning in a constructed argument, enables the thinker to make judgements about what to believe (e.g., the assertion that an outcome is the best solution) and is epistemic in nature. Both non-epistemic-normative evaluation (assessment of problem-solving reasoning) and epistemic-normative evaluation (assessment of logical reasoning) are required for evaluating the outcomes of problem solving.

In solving a complex ill-defined problem such as the problem of constructing a text for instance, several small judgements or decision-making tasks are solved (Bailin et al., 1999a) by the

problem solver who reviews and interprets the multitude of variables (Kurfiss, 1988[2]) that comprise the data to be worked on within the problem-solving steps they take. These judgements include what information to consider and select from the problem-solving context (e.g., the appropriate and relevant genre features, aspects of audience sociocultural values and practices, etc.). The smaller decisions in turn contribute to the larger decisions in sentences (e.g., what move to make, what stance to take, who to cite, what to use the citation for, etc.) that construct paragraphs, subsections, sections and chapters. The appropriate outcomes of decisions in a sentence could be multiple with some outcomes appropriate while others are not. Without normative evaluation, a writer would not be able to distinguish the effectiveness of the two categories of outcomes.

Given the variability of possible solutions that could solve problems, it is necessary for problem solvers to evaluate their effectiveness, i.e., to assess how well the outcomes are supported by the interpretation and review of data they are drawn from (Kurfiss, 1988, p. 2). This makes normative-evaluative reasoning critical and essential for effective problem solving. It is only when problems are effectively solved that arguments can be made to defend them. A diagrammatic representation of the interrelationship between the operations of problem solving and normative evaluation in CT is presented in Figure 2.2.

Normative evaluation is hence necessarily interrelated to problem solving as it provides the means to differentiate "superficial, careless, rash and naïve" (Bailin et al., 1999a, p. 287) reasoning from disciplined and well-thought-through reasoning that is reached about what to believe or what to do, on the basis of criteria such as "relevant rather than irrelevant data, credible rather non-credible sources" and "on the basis of appropriate evidence" (p. 290). It also allows critical thinkers to increase the probability of a desirable outcome (Halpern, 1998) because CT involves "evaluating the reasoning that went into the conclusion arrived at or the kinds of factors considered in decision making" (p. 451).

I have, in this section, supported my position that problem solving and normative evaluation are interrelated components of CT. I have also argued that normative evaluation is both non-epistemic (evaluating problem-solving reasoning to decide what to do) and epistemic (evaluating logical reasoning that constructs claims to decide what to believe). It is what Ennis (1987) describes as "reasonable, reflective thinking that is focused on deciding not only what to believe but also what to do" (p. 10); what Facione (1984) describes as "the development and

evaluation of arguments"; and what Halpern (1998) describes as goal-directed thinking which enables thinkers to make judgements about what to believe as well as what to do.

The operation of the interrelated reasoning of the two components of CT is social-cognitive in nature comprising thinking (cognition) that considers relevant information or standards embedded in the social context. The operation of social-cognitive problem solving and logical reasoning requires generic as well as context-specific knowledge which is largely tacit.

Figure 2.2 presents the interrelationship between problem solving and normative evaluation in CT.

The interrelated components of problem solving and normative evaluation which make up the social-cognitive theoretical construct of CT will be further unpacked for the context of academic writing in the next chapter to explicate their occurrence and operation in academic writing.
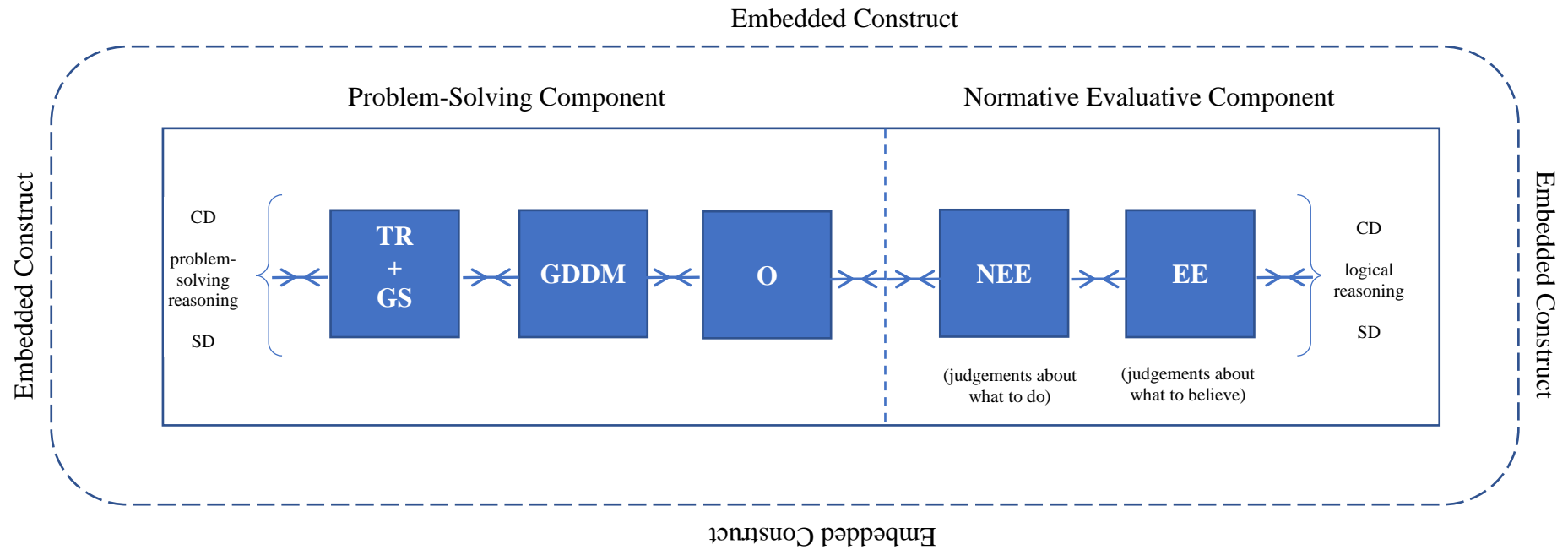
Embedded Construct

Embedded Construct

Embedded Construct

Embedded Construct

Problem-Solving Component

Normative Evaluative Component

CD

problem-
solving
reasoning

SD

TR
+
GS

GDDM

O

NEE

EE

CD

logical
reasoning

SD

(judgements about
what to do)

(judgements about
what to believe)

Legend

CD	cognitive dimension	NEE	non-epistemic evaluation
EE	epistemic evaluation	O	outcomes
GDDM	goal-directed decision making	SD	social dimension
GS	goal setting	TR	task representation

Figure 2.2 Interrelationship between problem solving and normative evaluation in CT.

2.5 Labels Describing CT in Subsequent Chapters

As was mentioned in Sections 2.2.1 and 2.3.1, there is a plethora of taxonomies in the literature for CT skills and processes and scholars use differing labels (e.g., skills, processes, steps) to refer to items in the taxonomies (discussed in Section 1.4). Further, a close examination of the items within these taxonomies (Appendix 2) shows that theorists also do not agree on the items to include in these taxonomies.

I have argued in Section 2.2.1 that the lack of agreement about the items to include in a taxonomy can be attributed to how CT is conceptualised by theorists. As such, it is necessary in this study to decide on a labelling system that would be relevant to how I have conceptualised CT. This labelling system will also need to be applicable for describing the operation of CT in the texts that will be analysed in the study.

My selection of an appropriate labelling convention is guided by its potential to describe the operation of problem solving and normative evaluation in academic writing. To describe the operation of problem solving, I have selected labels typically used in social science and research writing. Specifically, I have adopted Hayes's (1981) "steps" described in Section 2.3.1 (e.g., to create a task representation, to set goals, to identify constraints) to describe the "actions" in the stages of problem solving in text construction. In addition, I use cognitive labels such as mental processes (e.g., differentiate, interpret, classify in Section 2.3.1) to, where applicable, describe the underlying mental processes that can be extrapolated within steps. I hence use one set of labels (steps) to describe the stages or actions in problem solving and a different set (mental processes) to describe the underlying cognitive processes that are likely to operate within the steps. In so doing, I distinguish those labels that are more definitive and performative (action-like behaviours) from those that are extrapolated and refer to underlying and unseen mental processes (thinking behaviours). The labels for both performative and thinking behaviours will be obtained for existing taxonomies (Appendix 2) that have identified these behaviours. This system of labelling provides safeguards against labels that claim the visibility of mental processes which Bailin et al. (1999a) have critiqued. As I have pointed out in Section 1.4, they convincingly argue that skills, actions and steps are performative labels that are assumed to be visible in terms of their outcomes while process labels are interpreted to remain unseen and without an exact connection to specified external outcomes (Bailin et al., 1999a). This means it is quite impossible to make claims about a definitive link between underlying processes and specific performative outcomes (e.g., unlike physical processes such

as "run" and "bake," which are visible, processes such as "interpret" and "hypothesise" are not).

To describe the operation of normative evaluation, I have selected the common performative label "skill" (Bean, Ramage & Johnson, 2010; Browne & Keeley,1986; Cottrell, 2011; Gage, 1987; Toulmin et al.,1984) to refer to actions (e.g., to identify components of arguments, to determine the credibility of evidence, to expose the warrants that link evidence and claim, to provide backing that support warrants, to examine counterarguments, to determine the force of claims) related to argument analysis. These labels, like steps for problem solving, are used to refer to "actions" rather than mental "processes" performed by thinkers, where the occurrence of the unseen and underlying mental processes can be extrapolated from actions. Skills are hence complemented with cognitive labels such as mental process (e.g., assessing, questioning, evaluating, selecting, examining, anticipating, justifying, judging) where appropriate, to extrapolate processes that are likely to operate during the actions performed in the analysis and construction of arguments (as described in Section 2.2.1). I use infinitives (e.g., to identify, to construct) to indicate action labels and to distinguish them from process labels.

To name extrapolated mental processes, I draw on the lists of processes from the sampling of taxonomies presented in Appendix 2 for helpful terminology. Some examples of mental processes include drawing inferences, classifying, evaluating, synthesising, hypothesising, interpreting, drawing inferences, observing, looking for assumptions, predicting, analysing, querying, differentiating, conjecturing, drawing conclusions, self-correction (Bailin et al., 1999a; Ennis, 1981; Facione, 1990; Halpern, 1998; Raths, Wassermann, Jonas, & Rothstein, 1986).

2.6 Summary

This chapter has argued that CT is a social-cognitive construct that comprises the core components of normative evaluation and problem solving. It has further argued that the two forms of reasoning are interrelated and are required to enable thinkers to make judgements about what to believe or to do by distinguishing critical from uncritical thinking.

The construct is posited to be embedded in the social context because cognition (thinking) requires considerations from the social context for its operation. The several forms of knowledge required for CT are mostly embedded in the social context and are tacit. Pedagogies that can help learners make this knowledge explicit are required for the acquisition of CT.

Chapter 3

The critical-thinking construct in academic writing

This chapter continues the construction of the theoretical construct of CT for academic writing that commenced in Chapter 2. The core components and features associated with the CT construct presented there are further fleshed out in the present chapter using social-cognitive and genre theories of writing. The goal of this chapter is to argue for the occurrence and operation of the core components of the CT construct that were presented in Chapter 2, in academic writing.

The chapter is structured into three main parts. The first argues for the occurrence of problem solving in academic writing and the second for the occurrence of normative evaluation. Each section highlights how the two components operate in academic writing and argues for the interrelatedness of the components. The final section synthesises the discussion in the earlier two sections to present the theoretical construct of CT that will be applied in this study to a small sample of authentic texts to find answers to how CT contributes to successful academic writing.

3.1 Introduction

The two core components of the CT construct argued for in Chapter 2 exist in academic writing literature (Section 1.3) as two separate and unrelated conceptualisations of CT.

The occurrence of normative evaluation, the first core component, is evident in academic writing explicitly or by implication in descriptions of CT that describe mental processes and skills such as "responding in an evaluative, analytical way to texts" (Belcher, 1995, p.135), "analysing multiple, and sometimes competing, knowledge claims in a discipline to create one's own perspective" (Dobson & Feak, 2001, pp. 186–187); making inferences, drawing connections, identifying differences (Woodward-Kron, 2002, p. 126); "weighing of evidence and analysis of alternative theoretical perspectives" (Smith et al., 1999, p. 331); "critiquing the published literature," "assess[ing] and weigh[ing] up the value and importance of claims," "identifying arguments for and against theories, ideas, claims that were published" in postgraduate-level work (Bitchener & Banda, 2007, p. 66) and "[being] argumentative as opposed to merely exposit[ory]" and "possesses[ing] a critical dimension" (Andrews, 2007, p. 10). In fact, as mentioned in Chapter 1, this core component, described as the ability of writers to be "critical of previous work," makes "critical assessment of their own work, displaying a

high level of thinking and analysis in the process" (Mullins & Kiley, 2002, p. 380) particularly prized, not only by thesis examiners but also by assessors of successful academic writing (e.g., Andrews, 2007; Bitchener & Banda, 2007; Smith et al., 1999). This aspect of CT is epistemic in nature: thinkers use normative-evaluative reasoning (logical reasoning) to assess the assertions of truth in claims to decide what CT theorists describe as "what to believe."

The occurrence of problem solving, the second core component of CT, is less commonly referred to in academic writing literature and is evident in descriptions of problems encountered during text construction such as how "to transform information for the writer's own purposes in reading" (Carson, 1993, p. 100) by identifying relevant links between information in the source text and the writer's developing point; how "to synthesise their prior knowledge with another text in writing" (p. 100) by selecting relevant information from the source text to restructure in order to achieve the writer's own purpose; and how to integrate ideas with prior knowledge and to suitably incorporate them into "whatever is presently being read or written" (Crandall, 1995, p. 90). Reading and writing in these problems are considered interrelated in the construction of meaning, rather than as one (reading) being receptive and the other (writing) generative (Nelson, 2008). Nelson's (2008) research has found that interconnections between source text and new text during problem solving result in transformations that are "organizational, selective and connective" (p. 444) in nature. This aspect of CT is part of problem-solving reasoning and is used by thinkers to decide what CT theorists describe as "what to do" in order to achieve an outcome or solution for a problem encountered.

Though the above descriptions of CT in academic writing literature initiate an understanding of what CT means in academic writing, the interpretations of the two core elements remain separate, with one (CT as normative evaluation) given more prominence than the other (CT as problem solving) in discussions on the expectations of CT in academic writing. In fact, Richards (2000) argues that the relationship between CT and writing remains implicit and "taken for granted" (p. 94) while Gajdusek and vanDommelen (1993) argue the relationship is "insufficiently acknowledged" (p. 199), resulting in writing problems that tend to foster regurgitation of information (consumption of knowledge), rather than reasoning skills required to use information for knowledge-creating literacy (Applebee, 1984; Flower et al., 1990). There is, as far as I know, no attempt, in the existing body of academic writing literature that addresses CT, to consider if and how the two core elements relate to one another in academic writing. I will in the following sections argue how the interrelatedness of normative evaluation and

problem solving established in Chapter 2, using CT literature, is outworked in academic writing.

To do this, I will first use cognitive writing theory (Flower & Hayes, 1981) to show how the presence of the implicit relationship between CT, as problem solving, and writing operates in the composing process. I will then argue using social-constructivist theories of writing to show that CT as problem solving in text construction is not only a cognitive construct but a social one as well, arguing for the need to consider the sociocultural context in the reasoning that occurs during problem-solving composing. This social-cognitive nature of CT in the academic-writing context aligns with the conceptualisation of the CT construct argued in Chapter 2. Finally, I will show how Flower's (1989, 1994) social-cognitive theory of writing, which extends the cognitive dimension of problem solving to include the social context, provides the necessary theoretical framework to interpret the operation of CT as both a social and a cognitive process in composing. This framework, together with genre theory, which provides details of the sociocultural context indexed in textual decisions, will form the basis for interpreting how CT operates in the authentic texts that will be analysed in the present study.

After arguing the presence of social-cognitive problem solving in academic writing, I introduce the occurrence of the operation of social-cognitive normative evaluation and show how it interrelates with problem solving in the construction of texts. The order of the discussion of the core components of CT presented in this chapter: problem solving followed by normative evaluation, is in keeping with the order in which it operates recursively in academic writing.

3.2 The Cognitive Dimension of CT During Problem Solving in Academic Writing

This section aims to argue for and make explicit the implicit relationship that exists between the problem-solving component of CT and composing in academic writing. The occurrence of problem solving in the academic-writing process involves the writer engaging at several levels of problem solving that require good reasoning to arrive at good decisions about what to do (finding solutions for writing problems) during the composing process. Galbraith (1998) describes decision making in problem solving during the writing process as hidden and lying behind what appears to be a spontaneous process on the surface.

At least two models that posit writing as a problem-solving process exist in the literature. The first model, the knowledge transformation model by Bereiter and Scardamalia (1987), describes good writers as active problem solvers who engage in knowledge transformation during writing. In a nutshell, they posit that problem solving during knowledge transformation

involves solving problems that transform information for the writer's own purposes by making novel associations among different sources, and links between sources and the text being created, resulting in transformations that are organisational, selective and connective (Carson 1993; Crandall, 1995; Nelson, 2008; Petric, 2007) The second model is Flower and Hayes's (1981) seminal cognitive writing-process model, which describes the operation of problem solving in the composing process.

The latter model provides a window into the "context of discovery" (Kurfiss, 1988. p. 2) that cognitive scientists describe and that will be used in the present study. As mentioned in Chapter 2, problem solving in CT in this tradition is theorised as comprising "the processes involved when thinkers make sense of experience or data to impose structure and construct meaning for drawing plausible conclusions in contexts of inquiry such as problem solving and decision making" (Kurfiss, 1988, p. 25).

Writing, in Flower and Hayes's (1981) cognitive model, is posited as a thinking activity involving problem solving and decision making that are enacted in a series of steps known as heuristics. Writing, which in this view is considered an independent and individualistic act, is theorised as a complex cognitive task requiring problem solving to solve a communication problem (Flower & Hayes, 1977). The plausible outcomes of the operation of problem solving in CT during text construction, which result from deliberations that consider various criteria at various levels of decision making, are decisions finally realised as choices at the sentence level of texts (Flower & Hayes, 1981). An example of the levels at which problem solving occurs during text construction would be chapter, section, subsection, paragraph and sentence level.

The problem-solving process in Flower and Hayes's (1981) model draws on an information processing framework of problem solving (Newell & Simon, 1972). I have described this framework, which is adopted in the social sciences (Voss, Greene, et al., 1983) and in writing research (Hayes, 1981), as problem-solving steps in Section 2.3.1. The steps include a representation of the task comprising information about task environment and problem space, execution of the solution comprising the actions taken toward the achieving the solution goal, and evaluation comprising the assessment of the solution achieved. This framework is used in the next two Sections 3.2.1 and 3.2.2 to show how problems specific to academic writing are solved.

These subsections will discuss the operation of problem-solving steps in two key intellectual tasks that Flower and Hayes (1981) identify in the act of writing. The tasks comprise: defining

the rhetorical problem and goal-directed composing to solve the problem (Flower & Hayes, 1977).

The intellectual tasks which provide insight into how CT as problem solving operates in academic writing will be used in this study as the basis to infer what writers do during the decision-making process in text construction.

3.2.1 Task representation and problem-solving.

Task representation (Table 3.1) refers to the representation of the rhetorical problem to be solved. This representation comprises a representation of the rhetorical situation (task exigency and audience) and the goals writers set to fulfil the rhetorical demands of the situation through solving the writing problem (Flower & Hayes, 1977). An adequate construction of the problem task is clearly critical for the construction of successful texts. Flower and Hayes (1981) and Flower et al. (1990) have shown that an inaccurate or inadequate representation of the writing problem has profound consequences on the quality of texts produced because writers solve the problem they represent to themselves. They have found that students can respond to quite a different problem when presented with the same task, resulting in different quality of written outcomes.

Hayes's (1981) and Voss, Greene, et al.'s (1983) problem-solving steps (introduced in Section 2.3.1) provide insight into how the operation of problem solving in CT can help writers arrive at an adequate or accurate task representation that can drive successful writing. For a start, writers would need to carefully analyse the rhetorical situation presented to them. This would involve interpreting the problem statement of the writing task that needs to be solved by identifying tacit and explicit requirements of the task as well as constructing a picture of the potential reader(s) of the text to be constructed (as shown in Table 3.1). The requirements include information that will be used to create goals and subgoals to help the solver execute the appropriate actions to solve the problem and to identify the constraints within which the solution is to be executed (Flower & Hayes, 1980b). According to Hayes (1981), relevant background knowledge pertaining to the problem situation, such as knowledge of concepts and problem types in the field of knowledge, contributes to the accurate interpretation and representation of the problem in question

Citing the example given in Chapter 2, a problem statement could require the construction of the introduction subgenre of a PhD thesis where the problem is situated within the discipline of applied linguistics in the Faculty of Education. Information pertaining to the task exigency

(need or demand of the task) can be drawn using critical problem-solving questions such as those presented in column 3 of Table 3.1. The requirements or the demands of the task can include information such as the rhetorical purpose or outcome of the genre to be constructed, its schematic structure, the language of academic discourse to be used, conventions associated with the genre, and knowledge required to construct the propositional content of the genre (Nelson, 2008). Information pertaining to the audience could include interpreting who they are and anticipating what their biases might be, what background knowledge they are likely to possess, their reasons for reading the writer's text and any roadblocks they may have (Flower & Hayes, 1977).

The information constructed from the rhetorical context of the problem provides the writer with the information required for goal construction. Flower and Hayes (1980) have identified four categories of goals: reader, personal, meaning, text. Using the information from the rhetorical situation, writers deliberate on the goals they need to achieve to construct a successful genre. The goals and subgoals derived from information in the rhetorical situation to meet its exigencies or demands are presented in row 2 of column 3 in Table 3.1. The table shows that information such as the rhetorical outcome of the genre informs the goal related to the effect intended on the reader (e.g., to persuade the reader to accept a proposed claim), while information on who the reader is, in relation to the writer for instance, will inform the goal of how the writer wants to present themselves to the reader (e.g., the writer's voice or persona such as scholarly, respectful or critical). An inadequate representation of the problem task inevitably results in a lack of scope in goals constructed, leading to writing that could, for example, be centred primarily on the topic or content written about with little concern or awareness for the larger problem representation (Flower, 1981).

Writers also deliberate on goals pertaining to the levels and depth of complexity of knowledge, which requires transformation in developing the network of ideas within a text. Goals related to this could be to include contradictions, probes and the restructuring of old knowledge rather than to merely express the network of ideas available in memory (presenting information as stored in memory versus reconstructing by probing information). Flower et al. (1990) have found that poor task representation has consequences on goals constructed and contributes to a lack of knowledge transformation in written outcomes, resulting in texts that retell existing information rather than using information to create new knowledge. The research clearly shows that if problem solving does not result in adequate task representation, writers will construct goals which fail to "solve" or attend to important aspects of the problem. This in turn leads to

flat, undeveloped, conventional and information-heavy written outcomes as opposed to the breadth, depth and innovation observed in good writers' texts (Flower & Hayes, 1981).

Writers also deliberate on the goals for constructing the text such as its structure and conventional features. This could include goals that determine the "for" or the schematic structure of the text to be constructed. (e.g., constructing the structure of the introduction subgenre in a thesis versus a chapter in a book). Row 2 and column 3 of Table 3.1 show how macro goals are realised as more concrete local or micro goals as Flower and Hayes (1981) have theorised.

Table 3.1

Worked Example of Rhetorical Problem Solving: Task Representation and Goal Setting

Elements of the problem	Problem solving/critical-thinking acts	Examples of questions that guide the construction of the rhetorical problem representation [4]
Rhetorical situation		
Exigency (need or demand) or assignment (paint accurate picture of task or problem)	Analyse rhetorical situation Interpret problem statement to work out exigency Identify tacit and explicit requirements.	What outcomes does this writing task require me to achieve? What information or knowledge is required to solve the writing task? (information about the form of the discourse such as genre knowledge, the language of academic discourse, the conventions of the discourse, knowledge required to construct the content) (Nelson, 2008)
Audience (must paint accurate picture of my reader as well)	Interpret profile of reader in problem context Anticipate their reason for reading, their biases and knowledge backgrounds	Who is my primary reader? What might their biases be? What background knowledge would they possess? What might some of their reader-based prose roadblocks be? What might their reasons for reading be? (Flower & Hayes, 1977)

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[4] To avoid repetition in Section 3.3 and 3.4, the questions in these examples extend to the sociocultural context as well so that this worked example can also be used in those sections. The goals in a purely cognitive theory do not consider the sociocultural context in task representation and goal construction.

Elements of the problem	Problem solving/critical-thinking acts	Examples of questions that guide the construction of the rhetorical problem representation [4]
The writer's own goals (goals stipulate what writer needs to do to meet demands of situation and to solve the problem effectively. They guide decisions about choices to be made in text construction)		
	Using information drawn from rhetorical situation:	
Reader	Deliberate on goals related to the outcome or rhetorical /communicative goal (RG)of the genre to be constructed	What effect do I want to have on the reader? Macro goal (RG) e.g., • persuade/convince them (RG) to change their mind. Micro (local) goal e.g., • provide evidence to support claim that will make argument sound plausible
Persona or self	Deliberate on goals related to how to present oneself to the reader	What image do I want to present to the reader? What relationship do I want to establish with the reader? Macro goal e.g., • display critical, respectful, scholarly persona Micro goal e.g., • select appropriate vocabulary to show critique. tone, stance
Meaning	Deliberate on goals related to the level of complexity of ideas to be presented	What level of depth or transformation of information do I want to achieve: knowledge telling versus knowledge transformation). Do I want to merely express the network of ideas available in memory or probe contradictions, form new concepts, restructure old knowledge? What level of complexity do I want to display in relationships between ideas in the idea network in meaning construction? Macro goal e.g., • provide contradictions to existing knowledge • provide answers to probes on existing knowledge.

Elements of the problem	Problem solving/critical-thinking acts	Examples of questions that guide the construction of the rhetorical problem representation [4]
		Micro Goal e.g., • position ideas to show contradiction • combine ideas to construct new concepts
Text	Deliberate on goals related to developing the schematic structure of the genre to achieve its rhetorical goal	How do I want to represent formal and conventional features of the written text? What genre or form do I want to use to achieve my RG? Macro goal e.g., • construct a form of argument to show a gap in the literature subgenre Micro goal e.g., • select order and type of moves to create a niche (Swales, 1990)

Note: (Adapted from Flower & Hayes, 1980, pp. 27–28)

In using Flower and Hayes's (1981) model of problem solving to describe the operation of CT in text construction, I have assumed that writers possess sufficient knowledge to identify the relevant information in the problem space to construct the representation of the task they need to solve as well as to solve it. Following the representation of the problem and the goals set to solve it (described in Table 3.1), writers take the necessary actions to solve the problem and to evaluate the effectiveness of their solutions (Hayes, 1981; Voss, Greene, et al., 1983). This happens during the composing process through actions or operators such as decision making that are directed by goals to produce outcomes which are textual choices. These choices are then evaluated to facilitate the necessary revisions to improve them where necessary. These last two steps of problem solving are shown in Table 3.2.

Table 3.2

Worked Example of Rhetorical Problem Solving: Execution of Solution and Evaluation

Elements of the problem	Problem solving/critical thinking	Examples of questions that guide actions to achieve solutions/to evaluate outcomes of solutions
Solution (execute decision making during text construction)	Determine the macro-rhetorical goal of the genre in question. Identify the possible move functions that can construct the schematic structure to achieve this goal. Select the move function which will fit into the flow of the developing text to contribute to the target schematic structure.	What information does a writer need to consider in order to make a decision on the move to select, which will, for example, achieve the macro-rhetorical goal of convincing the reader of the need for their study?
Evaluation (evaluate solution [review/revise])	Judge the appropriacy of the move solution by considering its function, its fit into the flow of the developing text and its contribution to the overall rhetorical argument of the need for the proposed study. Repeat the problem-solving process until a solution (move) is achieved that will contribute to the target schematic structure and its rhetorical goal.	Does the move solution achieve the intended rhetorical outcome?

The operation and significance of goal-directed reasoning in solving the problems encountered during composing is elaborated in the next section.

3.2.2 Goal-directed decision making during composing.

CT during the decision-making composing process involves goal-directed reasoning. Goals mediate the various demands of the rhetorical situation and stipulate (as shown in Table 3.1) the outcomes a writer needs to achieve (e.g., effect on reader, image of writer, type of genre, transformation of knowledge required) in the solution to the writing problem encountered. Goal-directed reasoning occurs throughout the writing process as writers identify problems and subproblems to resolve. According to Flower and Hayes (1981), goals are the keystone of the writing process and provide the "logic" that moves the writing process forward, giving the underlying "coherence, direction and purpose driving the writing process" that appears to be a seemingly "chaotic and serendipitous act of discovery" (p. 379).

The goal-directed decision making that occurs in the execution of the solution step of problem solving in text construction is preceded by goal setting in the task-representation step (as outlined in the previous section). These goals occur at the macro (whole text) level, micro (word/sentence) level, and at the level in between where the goals are called "middle-range" goals and direct decisions in solving problems that comprise the act of text generation (Flower & Hayes, 1981). Studies from protocol analysis suggest that goals direct decisions through a hierarchy of goals with the higher level goals influencing and shaping the goals at the level below (Flower & Hayes, 1981).

Several episodes of goal-directed decision making or reasoning can occur in the text-construction process. In the selection of content information, a macro-level rhetorical goal such as "to persuade the reader that CT is a legitimate problem to investigate in academic writing" can be realised as a middle-level goal such as "present evidence of the problem of CT from existing literature," which in turn can be realised as a micro goal of providing concrete examples of studies at the sentence level. Goals direct the writer to critically select appropriate information to fulfil the requirement for appropriate content information in the text being constructed. Such goal-directed thinking potentially shifts the focus of the writer away from reproducing everything they know about the topic (knowledge telling) to critically deciding on information to select based on how the information can be used (knowledge transformation) to fulfil the goal of writing

In decisions relating to text structuring, a macro-level goal such as "convince reader of the need for the proposed study" can be realised as a middle-level goal such as "create sequence of headings, subheadings and paragraphs to support an argument structure to persuade." These goals can then be finally realised as micro-level move decisions that are appropriately sequenced at the sentence level to achieve the higher level macro goal.

Flower and Hayes's (1981) studies on protocol analysis have shown that CT reasoning executed as goal-directed reasoning during problem solving contributes to successful writing. Their findings show that good writers can seamlessly "pop" back up to higher level goals to fulfil the lower level goals, where higher level goals gave direction and coherence to their next move. Less successful writers, on the other hand, tended to be stuck at either macro-range goals, without being able to translate them into local decisions, or were locked in to micro-range goals such as finishing a sentence or correct spelling or word choice, losing sight of the rhetorical context (Flower & Hayes, 1981). The goals impacting the quality of decisions

realised as the textual outcomes of the completed text in the two groups (successful and less successful writers) also contrast in terms of being exploratory or narrow (covering many facets of a topic such as including counterarguments versus keeping the coverage restricted to a few aspects such as a single perspective); sensitive to audience or chained to topic (covering extensive content without awareness of the profile and needs of the audience); based on rhetorical savvy or focused on producing correct prose (focus on correctness of language without addressing the demands of the rhetorical problem; Flower & Hayes, 1981), depending on how adequately the rhetorical problem is represented.

Because the process of decision making is active and deliberate, text construction that engages in CT is a creative process aimed at solving an ill-defined problem. It is a process that cannot be solved by using a pre-existing template, i.e., by rote (Flower & Hayes, 1977). Though it would be impossible to identify the complete network of goals (not the purpose of this study) the writer has to negotiate at any given point of problem solving (a writer may be constrained by several factors such as the writer's repertoire of knowledge, language and the developing text), the theory provides a very powerful means of explaining how CT can be operationalised as goal-directed problem solving in the writing process. In the cognitive-process theory, problems which crop up throughout the writing process are primarily solved through negotiation of goals which are rhetorical, relational, and meaning and text related as discussed in Table 3.1 (Flower & Hayes, 1977).

The next section will turn to the social aspect of CT as problem solving.

3.3 The Social Dimension of CT as Problem-Solving in Academic Writing

This section argues that the social dimension of CT in problem solving, identified in Chapter 2, needs to be considered in academic writing. It marshals evidence from the literature to argue that thinking, including CT, whether enacting task representation or goal-directed decision making, is shaped by the culture of the community in which the thinking required for problem solving is situated.

Support for the social dimension of problem solving in academic writing can be drawn from the social-constructivist view of writing that posits texts to be socially (Bizzell, 1992; Bruffee, 1986) rather than individually constructed. This means that theories that are solely cognitive in orientation paint an incomplete picture of what happens during writing. The cognitive-process theory (Flower & Hayes, 1981) discussed in the previous section, for instance, accounts for the "what" (cognitive processes and their operation) involved during the construction of a text but

not adequately the "why" (the reasons) for the outcomes (decisions) of cognitive processes as it does not account for the other texts and members of the social context that contribute to text construction during CT reasoning in the problem-solving process of text construction.

In accounting for the social dynamic of writing, social constructivists (Bruffee, 1986) argue that writers construct texts through interaction with members of a discourse community, which, in the present study, is the disciplinary community and its texts. The construction of the text is hence considered a social act where CT that enables problem solving in writing must necessarily be rooted in the beliefs and practices considered normative in the discourse community. This means that for writers to be able to construct an accurate representation, which spells out the demands of a writing task, and to create goals that draw from the task representation to direct thinking (to solve the writing problem; Table 3.1), they would need an understanding of the normative practices of a discourse community. Practices achieve the status of convention in a discourse community through prolonged interactions among individuals who modify their reasoning, speaking and writing and bind the group as a discourse community who share common ways of reasoning and language use (Bizzell, 1992). Because the symbolic system (language) is inseparable from the knowledge it constructs, and is unique to the community constituted by it, the CT associated with solving writing problems during text construction must be exercised within the social framework of the disciplinary community in which knowledge is constructed (Bazerman, 1987; Bizzell, 1992; Hyland, 2004a; Parry, 1997)

The conventions needed for writing deemed to be successful and "acceptable" within a discourse community include the range of topics of research of interest to and shared by the members of the community, common models of knowing (research methodology), common discourse or textual practices and values intrinsic to the way disciplinary knowledge is constructed and expanded, standards of evidence and validity and borrowing of appropriate "traces"[5](including what can be presupposed[6]) to create texts that contribute to the maintenance of the community (Berkenkotter et al., 1991). These conventions or expectations shape goals and direct thinking during text construction by influencing decisions about choices such as what and how to say as well as how to organise information during text construction.

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[5] Traces is the term used by Porter (1986) to mean "the bits and pieces of Text which writers or speakers borrow and sew together to create new discourse" (p. 34).
[6] Presupposed is used by Porter (1986) to mean "assumptions a text makes about its referent, its readers and its context – to portions of the text which are read, but which are not explicitly "there" (p. 35).

The understanding of the embedded nature of discourse within the social framework of its disciplinary community (Porter, 1986), is critical to understanding the operation of CT in solving the writing problem. Specifically, new comers to a discipline such as novice writers need to be aware that the discourse of the texts they construct is governed and regulated by the framework of the social world provided by the discourse community in which these texts are constructed. Section 3.3.1 introduces the notion of genre to show how the conventions and practices of the sociocultural context are necessarily indexed in textual choices. Section 3.4 will then show how the social dimension of CT interacts with the cognitive dimension operating in problem solving.

3.3.1 The notion of genre and the social dimension of CT.

The social-constructivist notion of genre provides an understanding of the "complex responses" (Johns, 2002, p. 3) writers make to the demands of the social context. I introduce the notion here specifically to provide evidence of the relationship between text and context where conventions and practices of the social (disciplinary) context determine the adequacy of problem representation and the types of goals constructed to direct decisions resulting in textual choices. It is for this reason that the conventions and approved practices or expectations of the social world (discourse community) are said to be "indexed or codified in a text which reflects or conjures it up" (Hyland, 2004a, p. 1) in the textual patterns observed in it.

The term genre is used by Hyland (2004a) for grouping texts together representing how writers typically use language to accomplish social actions (e.g., apologise, instruct, argue, eulogise, etc.) in response to recurring situations. This definition, which is derived from Miller (1984), construes genre as rhetorical action in response to the exigencies of a situation. The view emphasises the interactional nature of genre's performance in context where genres draw their rhetorical purpose for action from the exigency ("objectified social need" [p. 153]) arising from the context with the aim of creating a particular effect that responds to this situational need. The successful performance of a genre is contingent on adequate task representation where social knowledge is needed to identify the discourse community's valued rhetorical practices and conventions for the normative "ways of acting together" (p. 163).

The relationship between text and context implied in the interpretation of genre in the previous paragraph accounts, in genre research, for the high degree of regularity evidenced in genres of the same grouping that use language in conventional ways to respond in recurring situations of interactions (Bazerman, 1988; Berkenkotter et al., 1991; Hyland, 2004a, Miller, 1984). The

following examples will show how task representation is informed by the demands of the social context that gives rise to the regularity of textual patterns observed in genres that "codify" the social world in their choices.

In selecting moves to sequence or stage the structure of a text, the relevant conventional practices or patterns of organisation associated with the genre in question influence the information selected for task representation and determine the kind of goals that drive the decision making of moves. The introduction subgenre, for instance, is typically associated with arguing the justification or need for a writer's proposed study as opposed to other subgenres such as the methodology chapter which argues for the justification of a study's research methodology. It is also conventional that the above rhetorical purpose of the introduction is achieved through a sequencing of moves well validated in genre research (Bhatia, 1993; Bunton 2002; Kwan, 2006; Swales, 1990). This sequence, depicted by Swales's (1990) CARS (create a research space) model, has shown that writers first create a research territory for their study before showing how they would occupy or undertake research in that territory. Further, the proposed research to be undertaken would only be considered valid if it is original and meets an existing gap in knowledge within the research territory identified. For a writer then to construct the introduction subgenre, they would need to identify the relevant information associated with the conventions of this genre in a representation of the problem task (the genre) to be solved. Such an adequate task representation would provide the information for the construction of the types of goals (e.g., create a research territory before occupying it, create a knowledge gap before stating the research question) needed to decide on the moves to select that would achieve a schematic structure that communicates the expected purpose of the genre. If goals are not shaped by conventions and if decisions during text construction do not reference them, it would be impossible to create a schematic structure with patterns that readers recognise as a particular genre.

In making stance-taking decisions (e.g., in decisions about hedging and boosting) to persuade the members of a discourse community to accept new claims, the values and practices relating to how interaction between members of a discourse community is conducted will influence task representation and the goals that direct the decision making of these devices. Writers in discourse communities within the social sciences, for instance, are expected to position themselves as researchers who are objective and open to alternative views. Unhedged claims would hence not be less common in these disciplines. Convention would require writers to not only assess the strength of their claims but also to anticipate the positions, beliefs, biases and

rebuttals of their proposed readers (Hyland, 1999, 2 (05, 2008). Writers are expected to balance the expectation for them to display originality and deference to a sceptical audience by seeking to advance new claims in a manner that aims to maintain collegiality (i.e., accommodating the reader's biases, beliefs, rebuttals and such) with them (Hyland, 2001). An adequate task representation, which considers the relevant contextual information such as the conventions around participating in the research community required for stance-taking decisions, would result in goals such as to hedge claims that are likely to be challenged and to boost claims that have strong evidence to back them and which are likely to be accepted by the readers with minimal opposition. An unawareness of the conventions around participation to advance claims could result in stance-taking decisions during text construction that are instantiated as choices producing texts that are overassertive (overuse of boosting) or underassertive (overuse of hedging).

Conventional practice around the use of citations also determines the adequacy of task representation and the goals that direct decisions related to the use of citations. For instance, in advancing new claims, writers are expected to display their credibility as scholars by showing their familiarity with the conversations related to the field of research in which their study is situated. They are also expected to signal how their work relates to and extends the work of prominent members of their disciplinary community (Hyland, 2004a). Adequate task representation of the conventions of citation use would result in goals such as selecting the relevant work of established scholars to display the credibility of writers (i.e., to show their familiarity with the field of their research). In addition, goals would include not only selecting the relevant work of scholars but also transforming the work to make the relevant connections between the existing work and the writer's own work (i.e., how the writer's work relates to and extends existing work). Goals that are not shaped by an adequate task representation that is determined by the social conventions of citation use during text construction are likely to result in decisions of citation that merely retell information without clearly showing how they serve or are relevant to the writer's own research and arguments (Kamler & Thomson, 2006; Petric, 2007).

Section 4.1.2 provides more details on how the operation of CT can be inferred in genre features.

3.4 The Interaction between the Cognitive and Social Dimension of CT in Problem Solving

Having argued for the cognitive as well as the social dimension of CT in problem solving, in the previous two sections, this section argues for the interaction between the two dimensions in problem solving. Flower's (1989, 1993, 1994) social-cognitive theory of writing, which is an extension of the cognitive-process theory of writing (Flower & Hayes, 1981), discussed in Section 3.2, provides the theoretical basis for this.

Flower's theory of writing acknowledges the limitations of the cognitive-process model (discussed in Section 3.2) she had earlier developed with Hayes. The model portrays the construction of texts inadequately as an individual and solitary act rather than one constructed in relation to others (Bruffee, 1986). Cognition in this theory does not include the consideration of discourse practices and conventions held by the disciplinary community in the representation of the task, since texts are posited to be constructed in the individual mind and communicated through language "to other minds in the context" (Bruffee, 1986, p. 784)

While Flower acknowledges the social-constructionist view (discussed in Section 3.3) that writing is a response to a rhetorical problem and that texts are constructed in relation to other readers, writers and texts within a discourse community, she critiques a purely social theory of writing for its failure to account for the individual writer's agency and original contribution (i.e., the role of the individual's cognition in the production of text; Flower, 1998, p. 283). Flower argues instead, in her social-cognitive theory, for the recognition of the interactive role of cognition and context in the writing process. The crux of her argument concerning cognition and context in the writing process is that while the context exerts its influence and constrains the writer as argued by social constructivists, it is the writer's cognition, primarily through task representation and goal setting that mediates the context in the construction of a text (p. 289). This intentionality of the writer, which is exercised in the mediation and interpretation of the sociocultural context, is critical for the exercise of choice and control in the construction of text (p. 292), and, I argue, is the essence of social-cognitive problem-solving reasoning during the operation of CT in academic writing.

The cognitive dimension of CT (cognition), on the one hand, is shaped by the social dimension of CT (sociocultural context) and requires social knowledge (Miller, 1984) to interpret the exigencies of the rhetorical context within which the rhetorical task to be solved is situated and where the discourse practices and conventions held by the disciplinary community provide the

expectations for how the members "act together." These expectations include awareness (social knowledge) of issues that are important to the community, the roles members play, models of knowing and conventions such as ways of arguing and the common language members share for communication. On the other hand, it is the cognitive dimension that provides the means for writers to contend with the expectations of their sociocultural context in their problem solving because it enables them to make judgements about what expectations to accommodate, revisit or reject (Flower, 1989). Flower refers to the interaction between cognition and context as a situated cognition.[7] According to her, cognition through the negotiation of goals helps writers navigate a pathway through various cultural, social and linguistic contextual cues to achieve a successful rhetorical impact on their readers (Flower 1993). The term "strategic competence" is used for the writer's ability to mediate criteria provided by a rhetorical context through appropriate goals and strategies (Flower, 1989).

Examples of general decisions requiring the interaction between cognition and social context in problem solving, cited by Flower (1993), include decisions related to how to respond to issues and questions the community cares about, working out how new ideas or comments fit into the existing picture, what language to use, how to organise propositional content, what evidence to select that people in the discourse community expect and value, among others. My examples of the interaction between cognition and social context can be drawn from the previous section (Section 3.3.1), which discussed how decisions about moves sequences, stance-taking devices and citations are made in relation to the demands of relevant conventional practices around their use in a disciplinary community during text construction. The selection of relevant information, pertaining to the conventions associated with each of these genre features, to include in a task representation of the genre and the construction of goals drawn from the representation for goal-directed decision making in text construction, require the cognitive dimension of CT, which I have described at length in Section 3.2. This thinking, which is inevitably shaped by the various conventions of the sociocultural context of the disciplinary community, also asserts control or agency over the demands of this context by determining how these demands will be managed for the construction of a successful text. Some mental processes mentioned during the operation of CT in Section 3.2.1 include analysing, interpreting, identifying and differentiating. CT guides writers to make effective as

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[7] Flower cites Brown, Collins, and Duguid's (1989) definition of situated cognition as "a conditioned sort of action, operating in responses to specific situations including context within the writer's own mind which changes as that writer constructs new meaning."

opposed to ineffective decisions about outcomes or solutions to problems encountered during text construction because it enables them to select the relevant considerations from the sociocultural context.

The arguments in Sections 3.2 and 3.3 culminate in Section 3.4 with Flower's (1989, 1993, 1994) social-cognitive framework to show that cognition and context during the operation of problem solving in CT inevitably interact to construct a text that is recognisable to its discourse community as a genre that demonstrates the familiar ways of participation of its members.

3.5 The Normative-Evaluative Dimension of CT in Academic Writing

While the occurrence of CT as problem solving in academic writing is considered implicit, its occurrence as normative evaluation can be considered overt. This probably explains why normative evaluation features almost exclusively in CT definitions (covered in Section 1.3) in academic writing, at the expense of problem solving. This section adds the normative-evaluative dimension of CT to the problem-solving dimension of the construct developed so far and argues for the interrelationship of the two dimensions in academic writing.

Normative evaluation (as described in Section 2.2) involves logical reasoning that functions to evaluate propositional claims, enabling thinkers to make judgements leading to decisions about what to believe (Beyer, 1995; Ennis, 1987; Paul, 1992; Siegel, 1988, 2010). This form of reasoning is expected in academic writing by members of Western academically trained communities who construct arguments to garner the consensus of their members. As such, writers in these communities are expected to use language to couch the solutions to research problems in a rhetorical form or argument that can visibly display the logical relationships of their informal reasoning according to the Western (Anglophone) tradition of inquiry (Andrews, 2007; Chandra, 2001; Gajdusek & vanDommelen, 1993; Miller & Charney, 2008).

To engage in normative evaluation, the members of a disciplinary community typically use elements such as claim, grounds, warrants, backing, qualifiers and rebuttal of a common argument schema (Toulmin, 1958/2003) to assess the validity of claims advanced by their peers. As mentioned in Section 2.2.1, Toulmin's model of argument provides an intellectual structure of logical reasoning for validating a constructed reality against criteria of evaluation and general standards of validity established by the disciplinary community in the social sciences, where "all scientific claims and findings remain open to scrutiny and challenge from the community" (Popper, p. 591, cited in Miller & Charney, 2008). This form of reasoning

neither accepts the defects of absolutism purported by natural scientists nor embraces the unpredictability of "anything goes" relativism (Miller & Charney, 2008).

Writers also engage in normative evaluation when they assess propositional claims to decide on the level of commitment to accord them. These assessments are signalled through various linguistic devices such as those identified in Hyland's (2005b, 2008) stance-taking model (e.g., possibly, generally, definitely, clearly). Normative evaluation is also crucial for the creation of disciplinary knowledge where new knowledge claims necessarily extend from the existing body of literature or knowledge through the conventional practice of critique and evaluation (Kaufer & Geisler, 1989; Woodward-Kron, 2002). In academic writing, knowledge claims are constructed and advanced through the writer's negotiation of prior texts (interpretation and evaluation of existing knowledge claims), the use of argumentation (logical reasoning) and persuasion (use of rhetorical devices such as stance and engagement) to convince sceptical readers to accommodate new claims of knowledge (Flower 1993, Hyland, 2004a; Kurfiss, 1988; Miller, 2008).

Although, normative evaluation is required in academic writing to assess the truth value of propositional claims (assessing what to believe), it is also required for assessing the problem-solving reasoning that leads to solutions resulting from problem solving (assessing what to do). As mentioned in Section 2.4, this evaluation is described by Halpern (1998) as evaluating the thought process, i.e., "how good a decision is or how well a problem is solved" (p. 451) and is also the final step of the problem-solving process. In this step, the problem solver evaluates the reasoning that went into the conclusion they arrived at in a textual choice by examining the appropriacy of the kinds of factors considered in goal-directed decision making, ideally with the goal of improving the reasoning process. For example, a writer can reason that a structural choice such as move x in a text was arrived at by considering the social-cultural rhetorical expectation or convention of the genre y they were constructing and the goal (e.g., to convince the reader of the significance of their study) constructed to achieve this expectation. The evaluation that assesses the thinker's quality of reasoning rather than the assertion of truth in a propositional claim is non-epistemic-normative evaluation. It is evaluation that enables judgements about what best to do when faced with a problem and is based on standards of good problem-solving reasoning.

The solution or outcome of the problem also necessarily leads to normative-evaluative logical reasoning that is epistemic in nature because problem solvers defend the efficacy of their

solutions through constructed arguments. The argument could, for instance, be that move *x* is an effective solution. The assessment of this claim would involve evaluating the data, warrant, backing, qualifier, and counterargument used by the writer to defend it. For example, to defend that move *x* was the best choice to make in the text in question for the construction of genre *y*, the writer would have to show the possible considerations (grounds) such as the need to fulfil the expectation of the research community for the writer to display a gap in knowledge to fulfil the rhetorical goal of genre *y*; the warrant or belief that showed the relationship between the expectation and the choice of move *x* and the backing or theory (genre theory) that supported this relationship. The writer could also qualify the claim by providing other options that could be suitable solutions and address threats (if any) to the warrant, such as genre theory is template reasoning rather than CT, by providing counterarguments of examples. This describes the "context of justification" (Kurfiss, 1998, p. 2), "reasonable, reflective thinking that is focused on deciding not only what to believe but also what to do" (Ennis, 1987, p. 10) and "the development and evaluation of arguments" (Facione, 1984, p. 259).

It is inevitable then that the problem-solving and normative-evaluative dimensions of CT in text construction are interrelated. Good writers engage in thinking that is evaluative and normative when they evaluate the reasoning in problem solving to ensure their solutions achieve the intended rhetorical outcomes of their choices (Halpern, 1998) and when they defend the outcomes of their decisions (choices) in text construction though logical argument (Kurfiss, 1988).

3.6 The Construct of CT in Academic Writing and the Knowledge Required for its Operation

This section synthesises the argument made in this chapter for the core components of CT and how they interact in the writing process with the help of the model of the CT construct shown in Figure 3.1. The interaction of the core components during the writing process generates texts that enact genres which achieve a social purpose, according to the conventions of participation within a disciplinary community. Some of the knowledge and skills required for the operation of each element of the CT construct are listed in Table 3.3.

Embedded Construct

Embedded Construct

Embedded Construct

Embedded Construct

Problem-Solving Component

Normative Evaluative Component

CD

mental processes
e.g.,
differentiate
interpret
infer
identify

problem -solving reasoning

SD

TR + GS

goals directing decisions
e.g.,

reader goal

interpersonal goal

textual goal

intertextual goal

outcomes/ decisions
e.g.,

text's purpose
writer stance
move structure
citation function

NEE

(judgements about what to do)

EE

(judgements about what to believe)

mental processes
e.g.,
examine
justify
anticipate
estimate

CD

logical reasoning

SD

standards
(beliefs, values, practices)
e.g., genre norms
interaction norms
knowledge creation norms

standards
(beliefs, values, practices)
e.g., relevance of data
validity of evidence
appropriacy of backing

Legend

CD	cognitive dimension	NEE	non-epistemic evaluation
EE	epistemic evaluation	O	outcomes
GDDM	goal-directed decision making	SD	social dimension
GS	goal setting	TR	task representation

Figure 3.1 The interaction between problem solving and normative evaluation in academic writing.

Figure 3.1 shows that the CT construct argued for in this chapter comprises a problem-solving and a normative-evaluative component, which interact with each other during the process of text construction within the social-cultural framework of a disciplinary community.

Social-cognitive reasoning exercised in task representation and goal-directed decision making during problem solving is required to achieve outcomes that meet the demands of the social-cultural context within which the text is constructed, to successfully enact a genre's communicative purpose. The social dimension of CT (the social context), which influences what needs to be represented in a task, differentiates genres and discourses while the cognitive dimension of CT (cognition), which is shaped by the social dimension, exerts influence on it by managing what is selected for task representation and goal direction, determining the outcomes of decisions instantiated in texts (e.g., move decisions, stance-taking decisions, citation decisions). The cognitive aspect gives writers agency to solve the ill-defined writing problems they encounter and to work out the choices they want to make in the construction of texts so that they are not merely following a predetermined template that produces texts according to a formula.

I have extrapolated mental processes such as analysing and interpreting the rhetorical context, and differentiating and identifying relevant information from it, to be in operation during problem solving to construct an adequate representation of the task in question (discussed in Section 3.2.1). The mental processes found in existing taxonomies were used to label the mental processes extrapolated. The task representation then provides the necessary information for setting goals to fulfil the requirements of the genre to be constructed through goal-directed decision making. These goals include goals to meet the reader's expectations (e.g., resulting in decisions related to the text's rhetorical purpose such as to persuade the reader to accept the need for the writer's proposed study); interpersonal goals to meet the interactional expectations between writer and reader (resulting in decisions related to stance-taking choices); textual goals to meet expectations related to the text's schematic structure (resulting in decisions related to move choices); and intertextual goals to meet the expectations of level and depth of meaning to be constructed (resulting in decisions related to how citations will be used).

The social-cognitive problem-solving reasoning, which results in decisions about outcomes during text construction, is then evaluated (non-epistemic-normative evaluation) according to the norms of problem-solving reasoning (e.g., the relevance of the information selected for task representation, and the appropriacy of goals that direct the outcomes of text construction) to

assess the reasoning process that led to the decisions (outcomes of problem solving). If a lapse is detected in the reasoning, the earlier problem-solving steps are repeated until an effective outcome is achieved, making problem solving and normative evaluation iterative and interrelated component-reasoning processes. Sound problem-solving reasoning would enable the problem solver to then construct an argument to defend the effectiveness of their decisions (the outcomes of problem solving) by applying the norms of social-cognitive logical reasoning (epistemic-normative evaluation). They would be able to construct arguments to defend their decisions that can be evaluated for the grounds that support their decision, the warrant that links the grounds to the decision, the backing that justifies the warrant, the list of other possible options' suitable outcomes (since more than one outcome is possible) and the presence of counterarguments against possible threats to the warrant (discussed in Section 3.5). I have extrapolated that argument construction and evaluation involve mental processes such as assessing, questioning, evaluating, selecting, examining, anticipating, justifying and judging.

The epistemic as well as the non-epistemic normative-evaluative dimensions of the CT construct are critical for distinguishing "superficial, careless, rash and naïve" (Bailin et al., 1999a, p. 287) thinking from the disciplined and well-thought reasoning required for making judgements about what to believe as well as what to do.

CT in text construction is undoubtedly a highly complex and dynamic process, which likely involves the need to simultaneously negotiate multiple goals during decision making to solve problems at several levels of a text (e.g., chapter, section, subsection, paragraph) that culminate at the level of a single sentence in the process of constructing a text. Although it is impossible to pin down all the goals at any given point of the text-construction process, the above construct provides a theoretical model based on well-established theories on how the various components of CT are involved in this process. Specifically, the model of the construct provides a theoretically anchored basis for the evaluation of the effectiveness of choices instantiated in completed texts because the considerations for decision making can be confidently extrapolated from the theories on which the construct has been developed. This CT framework, which can be used for the construction and evaluation of texts, differs from existing frameworks such as Davies (2011) and Meyers (1986) that describe how CT is engaged in content rather than text creation with a discipline.

The construct of CT developed in this chapter extends beyond the typically philosophically oriented interpretations found in existing academic writing literature. It is presented as a more

complex construct that comprises an implicit problem-solving component that interacts with the more explicit normative-evaluative component to construct texts that achieve specific social actions.

Table 3.3 presents some of the knowledge (drawn from various sources in the literature) required for the operation of CT in academic writing. The three categories of knowledge (context, content and generic) were introduced in Sections 2.2.2. and 2.3.2.

Table 3.3

Some of the Knowledge Required for the Operation of CT in Academic Writing

CT Construct	Declarative Knowledge (background knowledge)	Example	Procedural Knowledge (what a person can do) (knowing when and how to put particular strategies to use [Nelson 2008, p. 437])	Example
Problem solving (generic)	Problem-solving heuristic	Steps of problem solving such as representing a task adequately, executing an effective solution, evaluating the solution and consolidating the learning from the process (Hayes, 1981)	When and how to use problem-solving steps	Ability to: execute problem-solving steps
Task representation (non-generic)	Genre knowledge	Conventional organisational patterns and textual forms, approaches to staging particular content, devices for connecting one idea to another, authorial devices for guiding the reader, or metadiscourse, awareness of the perspectives of others' disciplinary terminology and citation practices (Beaufort, 1999; Nelson, 2008)	When and how to apply genre knowledge to the construction of a task representation	Ability to: identify relevant information from the problem-solving context to construct a representation of the task and the goals to solve a problem
Goal-directed decision making (non-generic)	Discourse knowledge	Basic linguistic knowledge (sound-symbol correspondence and syntactic patterns, knowledge of texts (Nelson, 2008)	When and how to apply discourse knowledge to text construction	Ability to: construct goals from the information represented in the task representation use goals to decide on choices to make during text construction

Normative evaluation (non-epistemic)	Problem-solving heuristics/methods of inquiry in the discipline	Steps such as representing a task adequately, executing an effective solution, evaluating the solution and consolidating the learning from the process/relevant methods of inquiry used in problem solving to reach a claim (Flower, 1989; Hayes, 1981)	When and how to apply problem solving steps or relevant method of inquiry to solve a problem	Ability to: determine the validity of the solution reached by using problem solving steps or relevant inquiry method
Normative evaluation (epistemic)	Elements of an argument schema and the logical relationship between them (generic)	The nature of logical relationship among claim, ground, warrant, backing, modifier and counterargument in an argument schema (Toulmin, 1958; Toulmin et al., 1984)	When and how to apply the relevant consideration to the construction and evaluation of arguments	Ability to: identify elements in an argument and evaluate the logical relationship between elements
	Beliefs, values and practices relevant to logical reasoning in a discipline such as standards of deliberation and argumentation, for making judgements	Recognising the types of evidence considered suitable for supporting claims in the discipline. Identifying warrants and locating the backing for arguments in the discipline (Bailin et al., 1999b)		Ability to: determine adequacy of supporting evidence identify warrants or assumptions that link supporting evidence to a claim establish backing for warrants identify opposing views and presenting counterarguments
	Content knowledge	Ideologies, problems, arguments associated with research topic (Bailin et al., 1999b; Berkenkotter et al., 1991; Macken-Horarik, 1996)	What and how to apply content knowledge: in problem solving	Ability to: use relevant content knowledge in decision making of genre choices (e.g., in the development of move structure)
			in normative evaluation	use content knowledge in the evaluation of propositional claims

Because CT is an embedded construct, the knowledge required for its operation is unique to its context and hence context specific in nature (apart from generic concepts such as the elements of the argument schema and how they are held in logical relationship and the steps involved in problem solving). This means, as discussed in Sections 2.2.2 and 2.3.2, the operational knowledge required for the application of declarative knowledge to engage in CT is tacit and

understood implicitly by members of the discipline, requiring new comers to be apprenticed into the ways of knowing, thinking and writing of the discipline to acquire knowledge of how its discourse can be constructed.

Apart from context-specific knowledge and generic concepts, writers also need an adequate level of content knowledge to solve research problems and to construct and evaluate propositional claims. This is because writers first solve research problems before solving the problem of how to present the research solution in writing (Flower, 1989). Macken-Horarik (1996) also argues that the effectiveness with which students can problematise and critique a field depends on "how thoroughly they have engaged with it as a specialised area of knowledge" (pp. 244–245).

The pedagogical principles for the acquisition of the knowledge required for problem solving and normative evaluation introduced in Sections 2.2.3 and 2.3.2 apply to CT in academic writing and will be used in Chapter 8 to discuss the implications of the findings of the present study.

3.7 Summary

This chapter has developed a construct for CT in academic writing. Cognitive and social-constructivist theories of writing have been used to flesh out the generic components, problem solving and normative evaluation, of the construct, which was first developed using CT literature in Chapter 2. It has argued that the problem-solving component of CT, which involves social-cognitive reasoning, and the normative-evaluative component of CT, which involves social-cognitive logical reasoning, interact iteratively in the operation of CT in text construction. Normative evaluation, which includes non-epistemic problem-solving reasoning and epistemic logical reasoning, is argued to be a critical part of problem solving, enabling thinkers to distinguish critical from less critical thinking. The core attributes of CT and its role in academic writing are summarised below.

Nature/Attribute	Source	Role	Operationalization
Normative evaluative	Philosophical tradition (CT theory) Writing theory	Evaluate arguments. E.g. are arguments sound	Argument analysis
Problem-solving	Psychological tradition (CT theory) Writing theory	Facilitate decision - making. E.g. what to consider when making appropriate move, stance, citation choices/decisions at the point of writing	Problem-solving steps
Interrelated attributes	CT theory Writing theory	Evaluate the basis for conclusions reached through problem solving	Problem-solving and argument analysis
Embedded in context of operation (knowledge required for operation is mostly tacit)	CT theory Writing theory	-	Knowledge required for its operation is mostly tacit. Information required for problem -solving are drawn from context. Standards for evaluation are drawn from context.
Social-cognitive in operation	CT theory Writing theory	-	Context shapes cognition and cognition manages contextual information to direct decision-making

Chapter 4

Methodology for text analysis to investigate critical thinking

Chapters 2 and 3 argued for the core elements of CT and their occurrence and operation in academic writing. This chapter will argue for a suitable methodology to use with the theoretical construct developed in the earlier chapters to investigate how the nature and role of CT derived theoretically contributes to successful writing in actual texts.

The chapter is divided into four main sections. Section 4.1 provides the justification for a genre-based discourse analysis to investigate the social-cognitive CT construct in texts and describes the conventions associated with the genre selected for the present study. Section 4.2 describes the sampling procedure used to collect texts. Section 4.3 gives an overview of the measures used to assess the presence and quality of CT in the genre features selected for study and describes how CT is operationalised in each of the features. Section 4.4 describes the procedure for the treatment, coding and analysis of data. Section 4.5 describes how information elicited from discourse-based interviews is used in the study.

4.1 Genre-Based Discourse Analysis

Discourse analysis (referred to as DA henceforth) is a methodology that promises to help us "understand why we make particular language choices and what we mean by these choices" (Paltridge & Wang, 2011, p. 256). It offers tools that look at the textual or conversational organisational patterns that are typical of particular uses of language (Swales, 1990). Specifically, DA offers insight into the influence of social and cultural settings on how people come to make particular choices in their use of language. Paltridge and Wang (2011) identify six approaches to DA in applied linguistics. They are speech act theory, cross-culture pragmatics, conversational implicature, politeness and face, conversational analysis and genre analysis.

Genre analysis (GA) is the analytic method selected for application in the present study. It is a qualitative and interpretive method of DA in which texts are analysed beyond the level of sentence to understand "how sentences were combined to produce meaning" (Hutchinson & Waters, 1987, p. 1). The method studies texts as discourse or language in use in social interaction. Bhatia, Flowerdew, and Jones (2008) describe it as the study of "situated linguistic behaviour in institutionalised academic and professional settings" (p. 10).

A key concept in GA is "genre" which was introduced in Section 3.3. To recap, according to genre theorists, a genre is a response to a particular need or exigence in a communicative setting that becomes regularised through repeated use to conform to prior uses "until the shape of these responses becomes expected by users" (Tardy, 2011, p. 54). Texts, as Hyland (2011) describes them, are hence not isolated examples of competence but concrete expressions of social purposes intended for particular audiences" (p. 194). These views draw on Miller's (1984) influential work, which defines genre as typified forms of discourse used to accomplish social actions such as to "apologise," "instruct," "argue," and "eulogise" among others. The goal of undertaking GA is to describe features of these socially recognised forms and actions by examining the relationship between textual choices and context. In this study, as will be described in Section 4.1.1, GA is taken further to infer how textual choices are reasoned during the writing process through the operation of CT in the features analysed.

Another key concept in GA is "discourse community." As discussed in Section 3.3, writing in the social-constructivist view propagated in genre theory is mediated by the social and cultural context in which it occurs and every text is embedded in the wider social practices of the discourse community, which carry assumptions about writer-reader relationships and about how they should be conducted. As such genres index the social context, this means a new genre user needs to get acquainted and to apply social knowledge such as rhetorical practices and conventions ("ways of acting together") required to meet the demands of the rhetorical situation from which they draw their rhetorical purpose from and to which are responding to. The implications of this for GA used to infer the operation of CT in the genre features of successful and less successful texts of novice writers is that the social context provides critical information for inferring the operation of CT in decision making during text construction.

GA methods span three orientations of genre theory in applied linguistics (Hyon, 1996; Tardy, 2011). New rhetoric adopts ethnographic rather than linguistic methods to study genres. The Australian tradition adopts a systemic functional linguistics (SFL) approach using a specialised theory of language to analyse the language-context relationship. English for specific purposes (ESP) adopts both linguistic and other non-linguistic methods such as interviews. This study adopts ESP methods of GA such as move, lexico-grammatical and intertextual analyses (Tardy, 2011).

4.1.1 Genre analysis: An appropriate approach for investigating critical thinking.

GA has been selected as a suitable methodology for investigating CT because, as demonstrated in Chapter 3 (Sections 3.3.1 and 3.5), cognitive and social models of writing (Flower, 1989, 1993) strongly suggest that genre features instantiated as textual choices during text construction are the outcomes of such thinking. I have argued that constructed texts are the outcomes or products of social-cognitive CT. The complementary relationship between social context and cognition in the writing process is acknowledge by both genre theorists (e.g., Flowerdew,2002; Hyland, 2003, 2004b) and social-cognitive writing theorists (e.g., Bizzell, 1992; Flower, 1989, 1993). These theorists describe the writing process as involving skills in planning and drafting as well as knowledge of language, context and audience (Tribble, 1996,)

Genre analysts (Hyland, 2004b; Tardy, 2011) also argue that though the social context constrains writers who are expected to consider and fulfil the conventions and practices of their discourse communities in the construction of a genre, this construction is not a mindless reproduction of templates which fulfil the community's expectations. Rather, genre construction requires the writer's agency (cognition) to make effective choices that can be evaluated (Hyland, 2004a, p. 19, refers to this as "critical evaluation") for their rhetorical consequences during text construction. Hence, though the social context constrains the writer's choices, the writer still has to navigate its demands to create a pathway during decision making to arrive at the best solution to their writing problem (Flower, 1989, 1993)

GA, as mentioned in Section 4.1, can reveal why writers make certain linguistic and rhetorical choices from the genre features revealed by using information from the social context. I will show GA can also be used to infer CT revealed in the genre features analysed by harnessing the interrelationship between social context and cognition implicit in the decision-making process (Flower, 1989, 1993) leading to the instantiation of genre choices (explained in Sections 3.3.1 and 3.4).

To illustrate, I will use the genre features selected for this study to show how social-cognitive CT can be inferred from them. The thinking behind genre decisions is firstly goal directed. This is supported by Flower's model of writing discussed in Chapter 3 (Section 3.4) and by advocates of social-cognitive writing theory. Bracewell and White (2003) describe writing tasks as a "set of goals and actions that implement these goals which are developed in order to achieve a solution to a complex problem within a specific work context" (p. 527, cited in Tardy,

2009). Further, the kind of goals writers set depends on the conventions and practices that govern the genre being constructed. Goal-directed thinking is hence socially shaped.

Goals set for the construction or revision of the schematic structure of the introduction subgenre would, for example, be shaped by the social expectation to create a structure that meets the communicative purpose of convincing the reader of the need for the writer's research (Bhatia, 1993; Swales, 1990). Writers, in their moves-decision making, would hence judiciously judge when the available move options (M1, M2, M3)[8] are called for, weigh the options' suitability and consider how they fit into the flow of propositional content and existing sequence of moves. Uncritical move decisions could result in a genre that is unlikely to resemble the introduction and would signal to the discourse community that the writer is a non-member. Bunton's (2002) study found that introduction genres that did not achieve their communicative purpose were found to lack the critical moves required for it.

In the selection of hedges and boosters, social-cognitive theory informs that goals are directed by social expectations including the need to allow for the alternative views and beliefs of the reader (Hyland, 1999, 2005b, 2008). To decide if a claim calls for hedging or boosting and the kind of hedge or booster to select, the writer has to assess the degree of certainty they would accord their claim and, as well, anticipate the reader's possible objections and beliefs concerning it. This would then lead to a selection of a stance (hedge or booster) that projects the writer to the reader as being open to negotiation or as being confident of the strength of their claim. Deciding on whether to hedge can also be interpreted as the writer's strategy to forestall the reader's potential challenge to their claim. Uncritical hedging and boosting decisions could result in texts that are either underassertive (overuse of hedging) or overassertive (overuse of boosting) (Hyland & Milton, 1997).

In deciding how to use citations, social-cognitive theory informs that the writer's goals are directed by social expectations that require citations to be used to locate their study in the existing body of literature and to show how their proposed research differs from existing work (Hyland, 2004a; Petric, 2007). In deciding to use citations evaluatively, for example, the writer's goal would be directed by anticipating the reader's expectations for them to show that their topic has not been researched before, to display they can select appropriate citations to expose deficits in existing knowledge and to show they are able to interpret and transform

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[8] Genre knowledge about moves in the introduction subgenre is provided in Section 4.1.3.

information from source texts to fit the argument in the text being constructed. Uncritical citation use could result in listing citations from source texts with little consideration for how they are relevant to the developing argument of the text the writer is constructing. This is a common problem among novice writers (C. Bruce, 1994; Kamler & Thompson, 2006; Petric, 2007; Smith et al., 1999).

4.1.2 Choice of genre for analysis.

The texts selected for analysis in this study belong to a research subgenre, the introduction chapter of a thesis. Several reasons account for my selection of this genre for the study on the nature and role of CT in academic writing.

The first and most important reason relates to how members of the academic-writing discourse community (reviewed in Section 1.1) conventionally associate CT with this subgenre. The introduction subgenre, which is often used interchangeably with the literature review to refer to the beginning chapters of the thesis (Kwan, 2006), is where the disciplinary community including examiners expect the writer "to exercise critical and analytical judgement" of the literature. This expectation, extracted from Section 1.1 and cited below, can for example be found in assessment guidelines (cited below) for PhD students in university websites such as

> Demonstrates knowledge of the literature relevant to the subject and the field or fields to which the subject belongs, and the ability to exercise **critical and analytical judgement** of it. (University of Auckland, 2018, 1e iii)

This requirement for postgraduate students also appears as "critiquing the published literature" (Bitchener & Banda, 2007, p. 66), the ability to "assess and weigh up the value and importance of claims" and "[identify] arguments for and against theories, ideas, claims that were published" (p. 66).

CT in the introduction subgenre is conventionally employed to fulfil the disciplinary community's expectation for the writer to argue for the claim of significance of their proposed study, which is a claim that the writer is undertaking to create new knowledge to fill a knowledge gap in the existing literature (Bhatia, 1993; Swales, 1990). To convince the reader of the existence of a knowledge gap, it is conventional for writers to critique existing literature. The term critique or critical evaluation as it is also commonly referred to is used for CT (Cone & Foster, 1993; Paltridge & Starfield, 2007; Woodward-Kron, 2002). It involves exposing the "mistakes," "irregularities," "holes" or "curiosities" of the existing "stock of consensual knowledge" (Kaufer & Geisler, 1989, p. 290).

Another reason for selecting the introduction is that it has been extensively researched and has been validated to exhibit a consistent, clear and logical move structure that has become conventional for achieving the expected genre goal of arguing for the significance of a writer's proposed study (Kwan, 2006), as mentioned in the previous paragraph. This conventional structure provides a readily available and reliable benchmark structure for coding and interpreting the move structures of my texts. The characteristic conventional schematic structure of the introduction comprises three tactical moves (M): establishing the disciplinary territory for the writer's work (M1), establishing a niche for it (M2) and occupying the niche (M3; Bunton, 2002; Swales, 1990). This structure is relevant to both research article and thesis introductions (Bunton, 2002; Kwan 2006), though the introductions in theses are much longer and the thesis[9] is considered a different genre to the research article. My study analyses thesis introductions.

Thirdly, the introduction has well-established conventions associated with it that offer an ideal site for investigating CT. For example, the absence of a move to stake new research territory by defining how the writer's study will fill their research gap(s) can be related to thinking that does not consider the relevant convention in the decision-making process leading to this move (Section 4.1.1). The absence of the move can also suggest a lack of discourse knowledge of genre conventions (declarative knowledge, Chapter 3, Table 3.3) and its application (procedural knowledge, Chapter 3, Table 3.3) that is required to guide CT (decision making) in the execution of the move in question (social-cognitive framework of writing). This absence, in turn, has a consequence on the writer who is expected to specify in the introduction how they will fill the knowledge gap, as the introduction chapter typically frames how the reader-examiner assesses whether the remaining chapters of the thesis have achieved the contribution to new knowledge proposed in it (Bunton, 2002). The display of discourse knowledge in a constructed genre is also required to signal the writer's membership to a discourse community (the indicators that signal membership are covered in Section 3.3).

The introduction is also the site where convention calls for the writer to situate their study since all new works are extensions of earlier research (Hyland, 2004a). Situating a study involves not only using citations to draw links between the writer's work and existing work but also

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[9] The thesis is written by novices trying to gain the right of passage into academia and has a limited readership of thesis examiners. The research article is written by members of the discourse community to other members to advance their knowledge claims.

differentiating the writer's work from that work (Hyland, 2004a; Petric, 2007; Thompson, 2001, 2005). The introduction is hence an ideal site to study how these conventions guide CT decision making in the selection and application of citations to construct this genre.

As an argument genre, the introduction also provides instances of genre features for the investigation of CT that is guided by predictable norms of persuasive strategies (Hyland, 1999, 2005, 2008) such as in the use of stance-taking devices. For writers to execute successful persuasive strategies, they must possess genre knowledge of the conventions of persuasion shared by their discourse community who expect to be persuaded in a manner the community would find convincing (Hyland, 1999, 2005b, 2008).

To conclude, the introduction subgenre, which expects writers to convince the reader of the significance or need for their study by situating it in the existing body of knowledge, identifying knowledge gaps in it and staking their knowledge contribution to a disciplinary community, is a good starting place to investigate the nature and role of CT in successful academic writing. It offers well-established conventions to guide the thinking required for genre construction, where writers are expected to not only display their knowledge of the field but also critically evaluate it (Cone & Foster, 1993; Kwan, 2006, Kwan et al.,2012; Paltridge & Starfield, 2007). The genre not only provides instances of generic features to analyse the overt examples (as mentioned in this section) of CT as social-cognitive logical reasoning (normative evaluation) in gap creation, it also provides instances of features to analyse implicit examples of CT as social-cognitive problem solving that are chosen to situate research and stake new territory that the genre argues for.

My study analyses the nature and role of CT in move, stance-taking and citation decisions in the introduction subgenre.

4.2 The Sample of Texts Analysed

The small corpus used in this study consists of eight introduction chapters extracted from eight theses. Seven of the theses were all organised according to the traditional "IlrMRD" (introduction, literature review, methodology, results and discussion). One thesis was a compilation of research articles, where the introduction was the first section of the research article organised according to the "IMRD" structure. Of the eight texts, six were from PhD theses and two were from master's theses. Though PhD theses require a higher level of academic attainment and originality to the contribution of knowledge than master's theses (could replicate earlier studies; Bunton, 2002), this difference does not compromise the study

because introductory chapters of both groups of theses have comparable move structures aimed at achieving the same communicative goal – to establish a research gap by justifying the need for or significance of the writer's proposed study

For the article-compilation thesis, introduction sections from two chapters (related research articles with similar structures) were combined to make up a single text with a word count comparable with the other texts and to have sufficient words (1000) to perform normalised frequency counts. Since rhetorical and linguistic features of a genre are subject to disciplinary variation (Hyland,1999, 2000, 2004a, 2005b, 2008), all texts selected for the present study came from a single discipline, applied linguistics, to minimise differences.

The corpus comprising two sets of four texts was nominated EX and NE in their display of CT by two experienced examiners from applied linguistics departments where students received supervision for undertaking research in the discipline. The two departments in their respective universities were situated in postcolonial countries where English was the medium of academic instruction. All student writers were non-native speakers in terms of their ethnicity though several of them possessed close to native-speaker proficiency in English. Students in these contexts are all expected to acquire knowledge and practices of research writing that fulfils an Anglophone system of discourse practices. There were three Chinese and one Indian student in each set that was nominated from the two universities. Supervisors in these contexts comprised both Anglophone and non-Anglophone academics with native-speaker proficiency. The researcher herself is born in one of these countries and has taught in both countries.

The corpus, which comprised 40414 words, is shown in Table 4.1.

Table 4.1

Introduction Texts in the Corpus: Type and Number of Words

Set	Reference code	No. of words
1	EX1A (Master's)	5313
	EX2A (Master's)	1949
	EX1B (PhD)	2961
	EX2B (PhD, article compilation)	2453
2	NE1C (PhD)	8957
	NE2C (PhD)	10451
	NE1D (PhD)	2937
	NE2D (PhD)	5393
Total		**40414**

The corpus can be described as a convenience sample (Fraenkel & Wallen, 2006). The texts in the corpus were extracted from examined theses that two examiners generously allowed me to access for the purpose of this research. This method of data collection does not jeopardise my results because it serves my research aim to use the CT construct I have developed on a small sample of texts to investigate the nature of CT and its role in differentiating texts nominated EX and NE in their display of CT. I expect to find discernible differences in the operation of CT in the two groups of texts. It is not my study's aim to make generalisations about the use of the features analysed in the two sets of texts.

Each nominated text was given a reference code (e.g., EX1A, NE1C etc.) that indicated if it was nominated EX or NE and grouped into two sets of four texts. The texts within each group were considered comparable as care was taken to select them from the same discipline and from universities with comparable demographics of supervisors and students. The sample size permitted me to perform in-depth analysis of the genre features I was investigating on the nature and role of CT. It is necessary to highlight at this juncture that the label descriptors EX and NE attached to each text originated with the thesis nominators who were asked to identify theses which demonstrated CT, either more successfully or less successfully. The nominators' judgement was informed by years of experience in publishing and reading research papers and supervision of postgraduate students, experience that built up a tacit understanding of what CT looks like in a piece of academic writing.

The ethics approval for the collection of data used in this study was granted by the University of Auckland Human Participants Ethics Committee (UAHPEC) on 22nd February 2013. Both the coder who assisted with the use of MAXQDA 11 (VERBI Software, 2011) software for coding the texts, and the third party who assisted with the transcription of interview data, were asked to sign a confidentiality agreement.

4.3 Operationalisation of CT

The text belonging to the introduction subgenre was the unit of analysis used in the present study. Each text was analysed to detect the presence and working of CT by closely examining instances of rhetorical and linguistic choices relevant to the genre features selected. These choices, as discussed in the study's theoretical framework, were the products or outcomes of reasoned decisions and expected to reveal something of the presence and quality of CT in texts. The three categories of genre features selected for analysis were moves, stance-taking devices and citation use.

A combination of quantitative and qualitative measures was undertaken to assess the presence and quality of CT in texts. Quantification is a measure used in this qualitative study to make comparisons, where required, between the frequency counts of tokens identified as linguistic and rhetorical choices of interest (Tesch, 1990). Where tallies were taken, they were converted into density counts by recalculating the tokens as if the texts were 1000 words in length. This normalising process was required for comparing texts of different lengths. To compute the figure for the occurrences of a feature, density counts were derived by dividing 1000 by the word lengths of texts to obtain a "1000-words factor." This factor was then used to recalculate the number of occurrences of a token by multiplying it by the factor (number of tokens x factor; Runbald, 2015).

The measure used to determine the presence and quality of CT in moves, stance and citation choices was the measure of rhetorical effectiveness of the various tokens studied in the texts. Rhetorical effectiveness was the operationalisation of CT inferred from move, stance and citation decisions in a text using the framework of CT discussed in Sections 3.3.1, 3.4 and 3.5. As rhetorical effectiveness impacts the quality of texts produced, it makes CT critical for successful writing. A move token was taken to be rhetorically effective if it achieved the genre's communicative purpose as determined by other studies on the introduction subgenre such as Swales (1990) and Bunton (2002). A stance-taking token was taken to be rhetorically effective if it achieved its intended persuasive outcome as determined by studies on stance use

such as Hyland (2005b, 2008). A citation token was taken to be rhetorically effective if the function it performed contributed to situating the writer's study and or to showing how the writer's study differed from existing work as presented in typologies of citation functions identified in studies such as Petric (2007) and Thompson (2001, 2005).

Although the genre decisions of each of the three features were analysed individually (as is conventional in GA) to infer the nature and role of CT in academic writing, CT in the decision making of each of the individual features is expected to interact with the decision making of the other features in real-time text construction.

The following three subsections explain how CT is operationalised in move choices and sequences, stance-taking devices and citation use. Appendix 6 contains the complete set of excerpts used in each of the three Findings chapters to illustrate how decisions on move, stance and citation features were made in the texts analysed.

4.3.1 Move and schematic structure.

The first generic feature selected for analysis is the move. The move is a rhetorical unit that has a communicative purpose which is both local and global/macro (Bhatia, 1993; Paltridge, 1994). Moves are critical to fulfilling the communicative purpose of a genre because they contribute to the construction of a schematic structure that achieves this purpose.

The following is an example of a move, M2, selected to construct the introduction subgenre.

> These studies in general have shed light on academic criticism but they are
> <u>insufficient</u> for language educators who have an interest in intervening in their
> students' specific academic criticism practices to help them to improve (M2).
> Extracted Excerpt 5.3A [EX1A]

The problem representation of a task that resulted in the selection of the above move, M2, would have included information such as the local purpose of M2, which is conventionally enacted by exposing defects (*insufficient*) in the knowledge claims of previous research existing in current literature (Swales, 1990). It would also have included information about the macro purpose of the move, M2, which is to contribute to the introduction subgenre's rhetorical purpose of arguing for the significance of the writer's proposed study (Bunton, 2002; Swales, 1990). The information in the task representation would also have included knowledge that genre theorists posit the construction of the rhetorical purpose of the introduction to be enacted through various permutations of three main tactical moves (M1, M2, M3).

Decision making to solve the problem of selecting the appropriate move (in this case move M2 from the three possible move options) during text construction would have been directed by the goal of fulfilling the reader's expectation of the introduction subgenre for the writer to locate an existing gap(s) in the literature to convince the reader of the need for their study (Bhatia, 1993; Bunton, 2002; Swales, 1990). Further, the rhetorical effectiveness of the enacted move M2, which can be assessed through normative evaluation of the reasoning process behind its selection and defended through logical reasoning, suggests clearly that the writer not only solved the problem of move selection but also evaluated it for its rhetorical effectiveness.

If a writer chose a move without adequate engagement in CT, it will result in the construction of a less successful text. Move M2 in Excerpt 5.1B below was not an effective choice because it did not fulfil its macro-rhetorical goal of contributing to the argument for the significance or need for the writer's study expected in an introduction subgenre.

> Among the four language skills, writing is a very important skill, yet it is also the most <u>neglected</u> one. (M2). Extracted from Excerpt 5.1B [NE2C]

Though the move M2 in Excerpt 5.1B enacts a research gap (*neglected*), the gap does not relate specifically to exposing a gap in studies relating to the research question on the writing process (e.g., of the research question: are the effects of planning conditions and subplanning conditions on text quality, fluency 1 and 11…) which the writer proposes to study. A successful enactment of move M2 would have included the goal to expose existing gaps in knowledge specific to the research topic being investigated.

4.3.2 Stance-taking devices.

The next feature selected for analysis is the stance-taking device. Hyland (1999) defines stance as the creation of the "authorial persona" of a writer intervening within a text by "deploying community-sensitive linguistic resources to represent themselves, their positions and their readers" (p. 120). Being able to communicate an appropriate stance is critical to getting claims accepted in a disciplinary community where readers are knowledgeable and sceptical audience who "have their own conviction and confusions" (Hyland, 2002, p. 531) and who expect to be persuaded by means they find convincing.

A representation of the stance-taking problem would include an understanding that claims are not advanced in a "social vacuum" (Hyland, 1999, p. 121) and that their acceptance is achieved through the interaction with the audience according to the social norms and conventions of participation within the disciplinary context in which the genre is constructed. The information

about the conventions of stance devices represented in a task would include the expectation for the writer to display collegiality and respect for the readers by showing an awareness and openness to objections and alternative views while advancing original and significant claims that communicate an objective, knowledgeable and scholarly persona. Problem representation would also include knowledge of what seminal studies such as Hyland (2005b, 2008) have shown about the available options of stance devices and how they function (see Table 4.2 in Section 4.4.2).

Excerpt 5.3A provides an example of a stance device (*general*) to hedge a claim about the benefits (*shed light*) and limitations (*insufficient*) of existing literature on academic criticism.

> These studies <u>in general</u> have shed light on academic criticism… but they are insufficient for language educators who… have an interest in intervening in their students' specific academic criticism practices to help them to improve. (M2).
> Extracted from Excerpt 5.3A [EX1A]

Decision making to solve the problem of selecting an appropriate stance for the claim being advanced in Excerpt 5.3A would have been directed by the goal to provide a balanced interpretation of the contribution of existing studies on academic criticism to the writer's research aim (*to help them improve*) as well as by the goal of anticipating and showing an openness to the alternative positions of the reader. The decision to hedge the claim about benefits of the existing studies shows the writer's awareness that opinions on this could vary among scholars. Hence the hedging in the social interaction displays an awareness of the potential objections, viewpoints and beliefs about existing knowledge (Hyland, 2005b, 2008) of the readers in question. On the other hand, the writer's decision to exhibit certainty in the claim about the limitations (*insufficient*) of existing studies, displays their confidence that they can support this claim with evidence, which the reader in this interaction anticipates. The rhetorical effectiveness of the stance choice suggests that normative evaluation was also exercised in the evaluation of the problem solving and logical-reasoning process that resulted in and justified the stance choice made by the writer.

If writers do not engage sufficiently in CT, they are likely to produce unhedged texts which suggest a more one-sided view that is either unaware of, closed to or does not consider the reader's possible objections, positions and beliefs.

> Although it upholds a non-English speaking culture [unhedged claim], it places a heavy demand upon graduate education which is expected to approximate the standards that are found in Britain. Extracted from Excerpt 5.9b [NE1D]

The unhedged claim in Excerpt 5.9b, about the country or society in question upholding a non-English speaking culture, shows a view that has not considered the possibility of readers disputing it as it is quite impossible for this claim to hold true for all sectors of the society unless it is highly homogenous (which in today's global world is quite impossible).

4.3.3 Citation selection and use.

The final feature selected to show how CT is operationalised in text construction is the selection and use of citations. According to Hyland (2004a), citations refer to the use and referencing of source texts and their authors for the purpose of constructing persuasive arguments. They are a requirement for the acceptance of knowledge claims in a discipline because new knowledge is necessarily advanced through the extension of existing knowledge (Hyland, 2004a)

The representation of the problem of how to use a selected citation in a text would include information about the rhetorical purpose of the genre in question. This information in turn will be related to information about the various possible functions of citations that can be used to achieve it. In the introduction subgenre, which argues for the significance or need for a writer's study, various functions of citations can be selected to construct the genre which conventionally comprises creating a research territory and exposing gap(s) in it for the purpose of justifying the writer's proposed research. Information on the various functions that citations can play in achieving the rhetorical purpose of the introduction subgenre would include knowledge from studies such as Petric (2007) and Thompson (2001, 2005), which are listed in Table 4.3.

Excerpt 5.3A, below, will be used to show how CT operates in the selection and use of the citation (*these studies*) evaluatively.

> These studies in general have shed light on academic criticism but they are
> insufficient for language educators who have an interest in intervening in their
> students' specific academic criticism practices to help them to improve. (M2)
> Extracted from Excerpt 5.3A [EX1A]

The decision to use citations (*these studies*) evaluatively (*shed light* and *insufficient*) in the above example is directed by the local goal of move, M2, to expose a gap in the literature relevant to justifying the need for the writer's proposed study. This function is successfully executed because it is also directed by the goal of exposing a gap in the literature that is relevant to the writer's research aim (to conduct research in academic criticism that can help improve students' practices). The execution of the citation function would also have involved normative evaluation where the writer would have interpreted a number of texts (*these studies*) and

weighed their positive aspects (*shed light*) against the limitations (*insufficient*). Apart from goal-directed thinking and evaluation, the effective selection and use of citations would have involved normative evaluation which assessed the problem solving and logical reasoning that led to the decision and defence of the rhetorically effective evaluative use of citation.

If a citation function is chosen without adequate engagement in CT, as in Excerpt 5.17 below, it would result in a less than successful text.

> *Language of Advertising*
>
> Thus, there are <u>studies of advertising</u> which have <u>little or nothing</u> to say about its pictures or music or the people who create it, but there are <u>also studies</u>, which describe the pictures of advertising <u>without paying any attention</u> to language. Extracted from Excerpt 5.17 [NE2D]

A writer can engage in CT at the level of the section without engaging in CT at the level of the chapter. In the above example, the writer did consider the local goal of move M2 to expose a gap(s) (*little or nothing, without paying attention*) in the literature, at the level of the section (*language of advertising*). At the level of the chapter, however, the moves in this section do not cohere with the moves in the other sections (found in the extended text not shown here) that make up the chapter, where the introduction was divided into unnumbered thematic headings lacking general cohesion of moves within and between headings.

4.4 Data Treatment and Coding

The preparation of the texts for coding involved assigning EX and NE texts with an alpha-numeric reference code to ensure the anonymity of writers in accordance with the ethics requirements of the university. EX texts were labelled 1A, 1B, 2A, 2B where 1 and 2 referred to the university from which the texts were nominated and A and B was used to differentiate the pair of exemplary texts within the same university.NE texts were labelled 1C, 1D, 2C, 2D where C and D differentiated the non-exemplary texts within the same university.

In the next step, the second coder and I hand coded the first text independently, using Swales's (1990) CARS model for move and step analysis. On checking for inter-rater agreement, we found many inconsistencies in how we applied the model to coding our data. To achieve a higher level of consistency, I developed a set of guidelines using functional semantic descriptors adapted from Kwan (2006). These guidelines are found in Appendix 3. With the guidelines, the second coder and I were able to recode the text together by teasing out ambiguity in the guidelines until we reached agreement. We then went off to code the remaining texts

independently before returning to compare our coding. Where we found disagreement in our coding of moves, we teased out differences until we reached agreement.

The second coder used MAXQDA, a coding and descriptive statistical analysis software for the GA, while I coded the texts manually. He prepared the texts for coding by converting the eight thesis introduction texts from.pdf to.rtf files with their "noises" removed. As he was an applied linguistics graduate student well trained in the use of the software, he was able to use the software to provide an inter-rater comparison for my manual coding as well as make it easy for me to extract the statistical information I needed for my study.

The process was repeated for identifying stance and engagement tokens using Hyland (2005b, 2008) and for citation functions using Petric (2007) and Thompson (2001, 2005). For stance taking and citation use, I had no opportunity to tease out differences with the second coder, to reach agreement after we had independently completed the final coding of the texts, because the coder was away on long leave and I had to return to my home university. I hence computed the inter-rater reliability for the codes and reported them accordingly for stance taking and citation use.

For the stance tokens, I found that differences in coding were mainly attributed to how the stance use in the text could be interpreted (usually more than one interpretation was possible). I counted the disagreements in the codes and converted them into percentages. The inter-rater reliability score was 91.4%. For the differences in the coding of citation tokens, I found that difference was not attributed to the possibility of a different interpretation of the coded feature but rather the second coder's inaccurate interpretation of the coding scheme. The inter-rater reliability score was 87.4%.

Apart from using MAXQDA programme (2011) to generate the tallies of the coded move, stance and citation tokens, the programme was also used to compute the lengths of texts, which I used to normalise tallies manually by converting them into density scores.

The second coder was deployed to code all the EX and NE texts while the supervisor who read my drafts checked the analyses of all excerpts found in this study.

The detailed procedure for the coding and analysis of move, stance and citation choices in texts are presented in the following subsections.

4.4.1 Procedure for coding and analysis of moves and move organisation.

Coding.

I first established the communicative purpose of the introduction subgenre by drawing on studies of the same genre such as Bunton (2002) and Swales (1990) to derive the schematic structure of the texts in my sample. The purpose of the introduction subgenre is to convince the reader of the need for or significance of the writer's proposed research. According to Swales (1990), the global or macro-communicative purpose of a genre regulates decisions about the propositional content, schematic structure and choice of register of the text.

Next, I applied Swales's (1990) CARS model, which provides a well validated framework to identify the configuration of moves that create the introduction's schematic structure. In this model, it is posited that the macro-communicative purpose of the introduction is achieved through three main tactical moves that individually function to: establish the disciplinary territory for the writer's work (M1), establish a niche for it (M2) and show how the writer's proposed study will occupy the niche (M3) which constructs the schematic structure. According to Bhatia (1993), moves in the introduction are enacted to justify a writer's proposed study through the creation of a research space that shows the link between what has gone before in the relevant field of research and the present work that is being reported.

To guide my identification of moves (M1, M2, M3), I applied Kwan's (2005) move-step scheme (Table 4.2), which she enlisted from various other genre studies on introductions. Each move function (M1, M2, M3) was taken to be realised by one or more steps that contributed to achieving the communicative purpose (local goal) of the move they form as proposed by Lewin, Fine & Young (2001) and Sinclair & Coulthard (1975) cited in Kwan (2006). The local purpose of move M1 (establish a territory) taken from Table 4.2 could, for instance be achieved through any one or all three of the steps 1.1, 1.2, 1.3 (centrality claiming, making topic generalisation, reviewing items of previous research). Steps are considered non-obligatory constituents and moves can be enacted recursively (e.g., M1M2M1M2…, M1M2M3M1M2M3…) to achieve the communicative purpose of the genre (Bunton, 2002; Kwan 2006).

Table 4.2 shows the move-step scheme used in the present study.

Table 4.2

Scheme Used for Move /Step Analysis

Move 1	Establishing a territory
Step 1.1	Centrality claiming
Step 1.2	Making topic generalisations
Step 1.3	Reviewing items of previous research
Move 2	**Establishing a niche**
Step 2.A	Counterclaiming
Step 2.B	Gap indicating
Step 2.C	Question raising
Step 2.D	Continuing a tradition
Move 3	**Occupying the niche**
Step 3.A	Announcing the purposes
Step 3.B	Announcing the work carried out
Step 3.C	Announcing research method
Step 3.D	Materials or subjects
Step 3.E	Findings or results
Step 3.F	Significance and justification
Step 3.G	Thesis structure

Source: (Kwan, 2005, Chapter 3 & Appendix 4).

Before the boundaries of steps were identified, the whole chapter was read to understand its content and to determine its communicative purpose (e.g., to convince the reader of the need to study academic criticism in college writing). The contents page was also scanned to ensure the introduction texts used in this study were extracted from an IlrMRD- (introduction, literature review, methodology, results and discussion) structured thesis. The literature review in this structure is divided into separate introduction and literature review chapters.

The step boundaries were then identified using a functional semantic approach (Bhatia, 1993; Kwan, 2006; Paltridge, 1994). Each segment of text (the sentence which is the step) was analysed functionally (purpose of step) to identify the move (M1, M2, M3) and the purpose (local goal) it contributed to. The moves were then collated to obtain the schematic structure of the genre and to determine how effectively they contributed to the global purpose of the text. The functional approach to deciding on boundaries and staging during coding involves the analyst asking how a segment (move or step) helps achieve the local purpose and the macro/global purpose of the text (Bhatia, 1993; Paltridge, 1994).

The accuracy of the move labels was enhanced using semantic criteria developed by Kwan (2006). The semantic criteria for move/step coding is included in Appendix 4. The accuracy and consistency of labelling was also maintained by considering the context within which the step was located. This meant reading the propositional content of steps before and after the one in question. The following Excerpt 4.1 is a worked example of move-step analysis.

Text	Code	Move Structure Sequence
Because "vicious criticism can seriously undermine an author's credibility" (Hyland & Diani, 2009, p. 9), effective <u>academic criticism</u>, such as that presented above, moves along a cline from more covert to overt manifestations (i.e., from entertaining the opposing view, to providing concessive details, to negation), and is thus carefully staged and managed to minimise interpersonal damage while advancing the writer's decisive position on the issue.	Function of step M1.2 = making topic generalisations. Semantic group = phenomenon under study. Semantic feature = practices. Step contributes to the local goal of M1 = to create the research territory for the writer's proposed study.	M1 comprises one step which constructs the study's research territory and contributes to the text's global goal to convince the reader of the need for or significance of the writer's proposed study.
The problem that motivated this study is my observation as an experienced teacher of General Paper that students who fare <u>less successfully</u> in their argumentative compositions tend to be those whose "ways of doing disagreement" (Holmes, 2009, p. 89) vary from the textual conventions and expectations governing appropriate enactments of academic criticism in academic writing in English. Although students generally do attempt to consider and respond to points of view that are alternative to their position in the essay, the manner in which academic criticism is played out in the arguments of less able students <u>does not reflect</u> the sophistication and subtlety of rhetorical moves and language structures that are observed in the academic criticism of more accomplished writers. Excerpt 4.1 [EX1A]	Function of step M2.A = counterclaiming. Semantic group = defects in established knowledge claims of previous research Semantic feature = flaws, limitations. Step contributes to the local goal of M2 = to create a research gap for the writer's proposed study. Function of step M2.A = counterclaiming. Semantic group = defects in established knowledge claims of previous research. Semantic feature = flaws, limitations. Step contributes to the local goal of M2 = to create a research gap for the writer's proposed study.	M2 comprises two steps which construct the study's research gap and contribute to the global goal to convince the reader of the need for or significance of the writer's proposed study.

In Excerpt 4.1, M1's contribution to the construction of the research territory of the schematic-move structure of the introduction was identified with the help of the claim made about how effective the phenomenon "academic criticism" can be staged and with semantic groups (e.g., phenomenon under study) and semantic features (e.g., practices) found in the semantic scheme for move/step coding developed by Kwan (2006).

M2's contribution to the construction of the research gap of the schematic structure was identified with the help of terms like "less successfully" and "does not reflect" and with semantic groups (defects in established knowledge claims or previous research) and semantic features (e.g., flaws, limitations) found in the move/step coding scheme.

Once the steps were labelled and the moves identified, the schematic-move pattern of texts was constructed with the help of Kwan's (2006) examples of three-move schematic structure

patterning (regular (1-2) n-3: 1-2-1-2-1-2….-3; regular (1-2-3) n: 1-2-3-1-2-3-…; irregular 3-move: 1-2-1-3-1-2-3) of literature reviews, as a reference.

Although the three fundamental moves (M1, M2, M3) of a conventional schematic structure can be enacted cyclically in various permutations of move combinations (e.g., M1-M2-M3-M1-M2-M1-M2-M1-M2-M3…;   M1-M2-M1-M2-M3-M1-M2-M3-M1-M2-M3-M2-M3…), the progression of the overall schematic structure is clearly identifiable as the progressive logical movement of the text to achieve the genre's rhetorical goal: to create the claim of significance for their proposed study through the establishment of the study's research territory, the identification of gap(s) within the territory and the proposal of research to occupy the gap(s). Bunton's (2002) and Kwan's (2006) study of introductions and literature reviews respectively have shown that successful genre writers use various permutations of the three basic moves to create their study's research territory (M1), the research gap/s (M2) and research occupation (M3) to justify the significance of or need for their research.

The coding of moves in the introduction chapter was intended to trace the progression of moves until the announcement of the occupation of the research gap (M3) because the purpose of my analysis was to determine if the writer was successful in constructing the claim of significance for their proposed study. This meant that other step functions such as announcing work carried out (M3.B), announcing research method (M3.C) and others were not required to achieve my research purpose. In spite of this, the whole text was coded as it was sometimes difficult to locate move M3, which announces the occupation of the research gap, especially in less successfully constructed texts. Also, although the introduction subgenre could have other subgoals such as problematising and declaring the study's significance, these goals in successful texts are expected to contribute to the achievement of the text's overall rhetorical goal (claim of significance). These goals are hence not singled out for attention in the present study whose aim was to trace the progression of the three tactical moves used to achieve the introduction subgenre's communicative purpose.

Analysis.
After the texts were coded, moves were analysed for their rhetorical effectiveness and interpreted for how CT could account for the rhetorical quality of the moves. The rhetorical effectiveness of moves in the texts was analysed at the move-pair (M1-M2; M1-M3; M2-M3) level in terms of how effectively these move pairs fulfilled their local purpose (exposing a gap in the literature; showing a relationship between the literature and the writer's study; occupying

the research gap/s, which contributed to the global communicative purpose of the introduction subgenre.

At the move-organisational level of the text, rhetorical effectiveness was analysed in terms of how effectively move sequences contributed to the organisation of the schematic structure of the text by clearly demarcating the research territory of the study, identifying the research gap(s) within the territory and announcing which research gap(s) the writer's study was undertaking. As mentioned earlier, a clear structure in the introduction chapter is significant for the purpose of framing the reader-examiner's expectation of the writer's contribution to knowledge in the remaining chapters of the thesis (Bunton, 1998).

As a matter of interest, I also chose to do a comparison of move M2 (counterclaiming) in EX and NE texts. This is because I wanted to know how the occurrence of this move, which requires critical analysis for its enactment, contributes to successful writing in the two groups of texts. As mentioned in Section 1.3, critical analysis, which is an aspect of CT commonly associated with the definition of CT, is conventionally associated with successful writing. I first compared the normalised density of the occurrence of this move in the EX and NE texts before I analysed the rhetorical effectiveness of the move.

A summary of the differences in the rhetorical effectiveness of move selection and sequencing decisions and their consequences in successful (EX) and less successful (NE) texts was then tabulated before the move decisions were analysed for how CT could have accounted for the differences in their rhetorical effectiveness.

To detect the active or reduced operation of CT, which drives move choices, execution and sequencing in academic writing in the next stage of analysis, I used the CT (problem solving and normative evaluation) framework, which I have argued to be cognitive and socially constructive, in Chapter 3, as the grounds for analysing the operation of CT in moves.

On the basis of socially culturally influenced problem solving, a genre-based task representation of the move problem was constructed which included information such as the communicative purpose of the introduction genre and the move options and functions available to achieve it. Goal-directed thinking was then applied to analyse how the expected and discernible goals (introduced in Table 3.1) led to the move choice in question. This involved analysing how the rhetorical/social goal of arguing for the need or significance for the writer's study by demarcating of research territory, the gaps within the territory and the proposed study to occupy the gap(s) identified) directed the move decision. It also involved simultaneously

analysing how the textual goal of displaying functional and propositional cohesion between moves across the chapter directed the move decision. The analysis of the move choice through the evaluation of problem-solving reasoning and the defence of the choice through logical reasoning, applying socially constructed norms, enables the analyst to decide on the rhetorical effectiveness of moves at the move-pair level as well as at the textual-organisational level.

Familiarity with the genre knowledge shared by the discourse community of users and knowledge of the writing process from a social-cognitive perspective is required to help the analyst create the task representation of genre to be constructed, its reader(s) and the types of rhetorical goal(s) writers aim to achieve when analysing how a move choice at the point of text construction is decided.

4.4.2 Procedure for coding and analysis of stance-taking features.

Coding

To compare how successful and less successful writers in the texts engaged with readers using stance-taking devices to achieve agreement, I undertook a lexico-grammatical analysis using Hyland's (2005b, 2008) model of grammatical devices for stance taking (referred to as ST henceforth) shown in Table 4.3.

Table 4.3

Stance-Taking Grammatical Devices, Functions and Examples

Grammatical Devices	Rhetorical Functions	Examples
Stance (rhetorical positioning of writer: authorial voice or persona)		
Hedges	Devices that indicate the writer's decision to withhold complete commitment to a proposition, allowing information to be presented as an opinion rather than accredited fact.	Possible, might, perhaps Bruce's (2014) study on criticality <u>might</u> improve learning outcomes.
Boosters	Devices that allow writers to express their certainty in what they say to mark involvement with the topic and solidarity with their audience.	Clearly, obviously, demonstrate The outcomes of the Bruce's (2014) study <u>clearly</u> shows the impact of the model on learning.
Attitude Markers	Devices used to indicate a writer's affective rather than epistemic attitude to propositions, conveying surprise, agreement, importance, frustration and the like.	Attitude verbs: agree, prefer Sentence adverbs: unfortunately, hopefully Adjectives: appropriate, logical, remarkable

		The outcome of the Bruce's (2014) study <u>was remarkable.</u>
Self-Mention	Devices used to present discoursal self to project how the writer stands in relation to their arguments, discipline and readers.	1st-person pronoun, possessive adjectives <u>I</u> think the design of Bruce's (2014) study can be adapted into other contexts because it is clearly described in his paper.

The grammatical categories listed in Table 4.3 were used to guide the identification and labelling of each ST device in the text. With an awareness of the content of the chapter analysed, its communicative purpose and the propositional content of moves that preceded and followed the move in question, the function of each ST device in a move was interpreted in relation to how it was used to advance the propositional claim of the move it was used in.

The following Excerpt 5.3A, taken from Section 4.3.2, is an example of how ST devices were coded.

Text	Code	Occurrence
These studies <u>in general</u> have shed light on academic criticism…but they are insufficient for language educators…who have an interest in intervening in their students' specific academic criticism practices to help them to improve. (M2) Extracted from Excerpt 5.3A [EX1A]	*in general* is coded a hedge ST device. It indicates the writer's decision to withhold complete commitment to the claim used to construct the counterclaiming move, M2.	1

In general in Excerpt 5.3A is coded a hedge based on Hyland's (2005b, 2008) typology because in the counterclaiming move, M2, the writer has decided to withhold commitment to the claim made about the extent to which existing studies "shed light" on their research interest about academic criticism practices useful to helping students. The ST choice was tallied as a single occurrence.

After all ST choices were coded, the tallies of the frequency of occurrences of the various devices in EX and NE texts were ranked as normalised densities of occurrences.

Analysis
To analyse the rhetorical effectiveness of persuasive strategies enacted by ST choices found in student texts, I first compared the distribution of ST choices in student texts with the distribution of ST choices in expert texts. This was done to obtain information on how student

texts compared with conventional practices (community norms of persuasion the students were trying to acquire) of ST use in applied linguistics, as reported in Hyland's (1999) study.

With an awareness of how student writers' ST choices compared with the conventional practice of experts in the discipline, I analysed the rhetorical quality of ST choices in EX and NE texts. I did this by assessing how effectively student writers managed the writer-reader interaction in a genre-appropriate manner with reference to conventions such as projecting a scholarly, collegial and unbiased persona that considered the strength of their claims as well as the views of the readers in the moves the ST devices were used in. Apart from evaluating how effectively the ST device was used in the move in question, I also considered how this move cohered with the moves that preceded as well as followed it. This was necessary as ST devices are persuasive strategies used to advance claims in moves that construct a larger argument in the introduction subgenre.

A summary of the differences in the rhetorical effectiveness of ST choices and their consequences was then tabulated before the ST choices were analysed in the next stage for how CT could have accounted for the differences in the rhetorical effectiveness of choices observed.

To detect the role of CT that drives ST choices, the CT framework was applied as described in the previous section to the ST choices. The task representation for managing the problem of genre-appropriate ST interaction with the reader was first constructed. It included information such as the need to cast the writer as a careful scholar not given to asserting claims without acceptable evidence; the need to assess the positions, biases, beliefs of readers and to convey the writer's consideration of the reader's views; and the need to balance these considerations with an assessment of the strength of claims being advanced. Goal-directed thinking was then applied to analyse how the expected and discernible goals drawn from the task representation such as considering the reader's views, assessing the strength of the claim being advanced and balancing this information in enacting the writer's stance, led to the decision on the ST choice in question. Goal-directed thinking was also applied to determine if the ST decision considered the functional and propositional cohesion of the move in which it was used.

As with the move analysis, genre knowledge of the conventions of stance use shared by the discourse community of stance users, and knowledge of the writing process from a social-cognitive perspective, is required for the analysis of CT in ST choices.

4.4.3 Procedure for coding and analysis of citation use.

Coding

To compare how successful and less successful writers in the texts used citations to construct the argument for the significance of their proposed study in the introduction, I used Petric's (2007) typology of citation functions to guide the identification and labelling of each of the citations in the texts.

Table 4.4 provides the typology of citations functions used for the coding, with examples for each function.

Table 4.4

Typology of Rhetorical Functions of Citations and Examples

Citation Type	Function	Example
Attribution	Used to attribute information or activity to an author	According to Hyland (2007)…
Exemplification	Used to provide information on the source(s) illustrating the writer's statement. The citation is usually preceded by "for example"	Swales (1990), for example, argues…
Further reference	Used to refer to works providing further information. Citation is preceded by "see"	See Kwan (2006) for…
Statement of use	Used to state what works are used in a thesis and for what purpose	Petric's (2007) typology of citation functions, which she developed from Thompson's (2001, 2005) typology, is used to…
Application	Used to make connections between the cited and author's work in order to use the arguments, concepts, terminology or procedures from the cited work for the writer's own purpose	The Australian approach focuses on an analysis of texts using linguistic analytical methods to deconstruct how contexts shape the linguistic choices used to construct the genre while the American approach focuses on the analysis of contexts using non-linguistic ethnographic methods for the purpose of showing the influence of context on genre construction. The more eclectic ESP approach uses both linguistic and ethnographic methods (Hyland, 2004a; Paltridge, 2012; Thompson, 2002) and is chosen for this study which is situated in the field of ESP
Evaluation	Used to evaluate work of a cited author for a purpose relevant to advancing the writer's claim/argument by using evaluative language	The definition of CT presented by scholars such as I. Bruce (2014), Cheng (2006), Pemberton and Nix (2012), Flower et al. (1990) and Woodward-Kron (2002) in the existing literature remains ambiguous and inconsistent (having various interpretations and labels), and it is aim of the present study to derive an interpretation that teases out contradictions and limitations of the various views already in existence in the literature
Establishing links between sources	Used to point to links, usually comparison and contrast, between or among different sources used.	The definition of CT presented by scholars such as I. Bruce (2014), Cheng (2006), Pemberton and Nix (2012), Flower et al. (1990) and

	This category is also attributed to a group of studies or authors, followed by a list of citations	Woodward-Kron (2002) in the existing literature remains ambiguous and inconsistent….
Comparison	Used to indicate similarities or differences between one's own work and the works of other authors, typically when discussing the findings	Table 5.1 below shows that writers have preferences for either a regular (1-2) n-3 or an irregular 3-move pattern similar to two of the many move permutations/configurations identified in Kwan (2006)
Others	Used to indicate cases where the relationship between the citing sentence and the citation is obscure	The purpose of this study is to examine the differences in rhetorical effectiveness between two sets of texts (Hyland, 2005b)

The coding of citations was undertaken with a good familiarity of the content of the chapter analysed, its communicative purpose and the propositional content of moves that preceded and followed the move in question. With this backdrop, I interpreted the function of each citation in terms of how it was used to construct the propositional content of the move, which was enacted to achieve a purpose that contributed to the text's schematic structure and macro/global purpose.

The following Excerpt 5.3A, taken from Section 4.3.3, is an example of how citations were coded.

Text	Code	Occurrence
These studies in general have shed light on academic criticism…but they are insufficient for language educators…who have an interest in intervening in their students' specific academic criticism practices to help them to improve…(M2) Extracted from Excerpt 5.3A [EX1A]	The citations referenced in *these studies*, which are mentioned in earlier moves, are used evaluatively (*insufficient*) in the counterclaiming move, M2 to create the research gap for writer's proposed study.	1

These studies in Excerpt 5.3A are evaluated as *insufficient* and so coded as performing an evaluative function in the construction of the counterclaiming move M2, which achieves the rhetorical goal of creating a research gap (that existing studies on academic criticism are inadequate for helping students acquire its practices) for the writer's proposed study, which is required to fulfil the macro/global rhetorical goal of arguing for the significance or need for the writer's study. The evaluative function of the citation was tallied as a single occurrence.

After all the citation functions in EX and NE texts were tallied, they were ranked in terms of their normalised densities of occurrence.

Analysis

To determine the rhetorical effectiveness of citation choices used to construct the argument of the introduction chapter, which was to justify the need for the writer's study, I analysed the rhetorical quality of these choices in EX and NE texts. I did this by assessing how effectively writers managed the problem of using citations to construct a research territory and expose relevant gaps in it to locate their proposed study in the existing body of knowledge, with reference to conventions such as using citations to draw links between existing work and the writer's proposed study and differentiating the study from existing work (Hyland, 2004a). As was the case for the analysis of ST devices, I also considered how the move in which the citation was used cohered with the moves that preceded as well as followed it. This was necessary as citations are used to construct the propositional content of moves that contribute to the macro/global argument of the introduction chapter.

A summary of the differences in the rhetorical effectiveness of the citation functions used in the coded choices, and their consequences, was then tabulated before the citation functions of these choices were analysed in the next stage for how CT could have accounted for the differences in their rhetorical effectiveness.

The framework for CT (problem solving and normative evaluation) was applied to detect the operation of CT that drives the functions of citations used in the texts. The task representation for managing the problem of selecting genre-appropriate citation functions was first constructed. This included information such as the need for citations from sources to be used transformatively to situate the writer's study within the existing body of relevant literature by drawing links to them to differentiate the writer's study from existing work and to show how the writer's study contributes to the landscape of existing literature. Goal-directed thinking was then applied to analyse how the expected and discernible goals drawn from the task representation, such as using citations transformatively to draw links and to differentiate the writer's study, led to the decision on the function used in the citation in question. Goal-directed thinking was also applied to consider if the citation decision considered the functional and propositional cohesion of the move in which it was used.

Knowledge of the conventions of citation use shared by the discourse community of users, and knowledge of the writing process from a social-cognitive perspective, is required for the analysis of CT in citation choices.

4.5 Discourse-Based Interviews

The use of a combination of methods in writing research has the potential of helping the researcher gain a more complete picture of complex reality and bringing greater plausibility to the interpretation of results (Hyland, 2011). The discourse-based interview (DBI henceforth) is one such method used to complement text analysis to achieve this goal. It is an interview method that uses a sample of writers to elicit information from them "to make explicit the tacit knowledge or strategies that writers and readers bring to acts of composing" (Hyland, 2005a, p. 182).

In my study, I used DBIs for two purposes. The first was to complement data from text analysis for the purpose of identifying the CT processes that contributed to the rhetorical effectiveness of genre choices made during text construction. The second was to extrapolate the complex embedded and tacit knowledge (Collins et al., 1986; Greeno, 1980; Kurfiss, 1988) required for understanding the nature and role of CT that can be retrieved from the contexts and activities that facilitated the acquisition of CT reasoning in text construction.

The interview sample comprised two of the four successful (EX) writers whose texts I analysed in the earlier stage of the study. The writers, one from each of the two institutions from which my sample texts were nominated, were located with the help of the academics who nominated the texts. The two EX writers not included in the interview could not be located.

After obtaining each participant's consent, I developed the interview guide for the semi-structured DBI. The guide comprised two sections of questions. The first part sought to obtain information about how students made discourse decisions during text construction. The second part sought information on how students acquired the knowledge and skills required to make these decisions effectively. The use of a semi-structured interview format had two main benefits (Dornyei, 2011). It allowed me to ask questions that gave the focus and consistency required to direct my interviewees. At the same time, it gave me the flexibility to probe and prompt interesting developments by allowing the interviewees to elaborate on or clarify issues as they arose.

Participants were given a month to read through the interview questions and to seek clarification if it was required. They were also given the option before the interview to write out their answers if they chose to. Allowing the participants to review the questions, and write out answers before the interview, gave them more thinking and preparation time. During the interview, the participants and I referred to the relevant aspects (content development, stance

use and text structure) of their introduction text to discuss the questions in the interview guide. The interview questions are found in Appendix 5.

Interviews were first transcribed verbatim including fillers and other conversation features such as false starts, repairs and repetitions by a third party. After the data was read carefully to gain familiarity with the content, I labelled the CT processes associated with the episodes of decision making within the three categories of questions asked (propositional content development, stance use, argument structure and organisation), using a template of codes that I compiled (Crabtree & Miller, 1999, cited in Dornyei, 2011) from my genre analysis (see chapter summaries of findings) and existing taxonomies (see Appendix 2). The findings of the analysis were incorporated into the discussion of CT within the chapters reporting the rhetorical differences of genre features analysed through GA.

The data was also coded for how the two successful writers acquired the tacit knowledge and reasoning skills for successful writing by identifying the various contexts and activities that facilitated the acquisition of CT. To do this, I used the procedure for content analysis (Dornyei, 2011) to code the types of activities and the learning environments that supported the writer's acquisition of CT in the episodes of decision making coded earlier in the three categories of questions asked (CT in text structure construction, CT in source text transformation, CT in stance use and CT in other areas). I then coded where available the knowledge that participants describe they acquired. The findings were incorporated into the discussion of CT within the chapters reporting the findings on rhetorical differences of genre features analysed though GA and in the discussion of the pedagogical implications of this study.

4.6 Summary

This chapter has argued that genre analysis, a form of discourse analysis, is a suitable method to use with my CT framework to study the nature and role of CT in academic writing. It has provided the justification for the selection of the genre and the genre features analysed in the study. The chapter has also provided detailed accounts of the procedure employed for the compilation of the corpus of texts used in the analysis and for the coding of genre features selected. This account includes an explanation of how genre features were analysed for rhetorical effectiveness and how CT was inferred to account for this effectiveness. The final section of the chapter has described the purpose of using discourse-based interviews to complement GA and included a detailed description of how interviews were coded and analysed for use in this study.

Chapter 5

Findings and discussion on moves

This is the first of three chapters that reports[10] on the findings of GA. The chapter has two main goals. The first goal is to report on how EX and NE texts differed in the rhetorical effectiveness of moves choices, where rhetorical effectiveness was determined in terms of the considerations made in arriving at the move choice decisions that achieve the communicative purpose of the move in question during text construction (as described in section 4.3.1). The second goal which involves the implicit link between CT and writing is to examine how the construct on the nature and role of CT developed in Chapter 2 and 3 can account for the surface differences in the rhetorical quality of moves observed in the two groups of texts. It involves extrapolating the underlying thinking processes/behaviours (discussed in section 2.5) related to how decisions on moves are made during problem solving and evaluation of move choices in the construction of texts.

The chapter is divided into two main parts. Section 5.1 reports on the findings of move analysis and Section 5.2 discusses the findings. The findings in Section 5.1 are further subdivided into subthemes. 5.1.1 presents findings on how move pairs in EX and NE texts execute their rhetorical functions within the subsections they are enacted in. Section 5.1.2 presents findings on how move sequences across larger segments of texts construct a schematic structure which fulfils the macro/global rhetorical goal of the text. Section 5.1.3 presents findings on the effectiveness of the counterclaiming step that enacts M2 to expose a gap(s) in the literature through the use of evaluative language.

Section 5.2 is divided into three subsections that discuss CT in move decisions. Section 5.2.1 discusses the CT processes in task representation. Section 5.2.2 discusses the CT processes in the enactment of moves in move pairs and move sequences in larger stretches of texts. Section 5.2.3 discusses the CT processes in evaluation required to expose defects in the literature to enact the counterclaiming move M2. Interview data is used to complement the discussion of CT processes inferred in the enactment of moves where the data was available.

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[10] Segments of excerpts reported in the findings and discussion sections are italicised.

5.1 Findings: Move Choices in EX and NE Texts

The analysis of move sequences in both EX and NE texts displayed a cyclical three-move generic structure (Bunton, 2002). Table 5.1 shows that writers displayed either a regular (1-2) n-3 or an irregular three-move pattern in both sets of texts, similar to two of the many move permutations/configurations identified in Kwan's (2006) analysis of literature-review texts.

Table 5.1

Move-Sequence Configurations Found in Exemplary and Non-Exemplary Texts

EX Text	Configuration	NE Text	Configuration
EX1A [MA]	Irregular 3-move 1-2-3-2-3	NE1C [PhD]	Irregular 3-move 2-3-1-3-1-3-1-2-1-2-3
EX2A [MA]	Regular (1-2) n-3 1-2-1-2-1-2-3	NE2C [PhD]	Regular (1-2) n-3 1-2-1-2-1-3
EX1B [PhD]	Irregular 3-move 1-3-1-2-1-2-3-1-2-1-3-1-2-1-2- 1-2-3-2-1-2-3-1-2-3	NE1D [PhD]	Irregular 3-move 3-2-3-2-1-2-1-3-1
EX2B [PhD]	Irregular 3-move 1-2-1-2-1-1-2-3-1-3-1-3	NE2D [PhD]	Irregular 3-move 1-2-3-1-3-1-3-1-2-1-2-1-3-2-3-1-3- 1-2-1-3-1-2-1-3-1-2-1-3

The analysis, however, showed that there was a clear difference in the rhetorical effectiveness of move choices in EX and NE texts in terms of how they contributed to the macro/global communicative or social-rhetorical-argument goal of the subgenre: to convince the reader of the need for the writer's proposed research. The introduction subgenre is where the writer is expected by the research community to argue for the significance of their study (Bhatia, 1993; Swales, 1990).

The global communicative goal of arguing the significance of the writer's proposed study in the introduction subgenre is achieved through the enactment of three fundamental moves (M1, M2 and M3), which contribute to the demarcation of the study's research territory (M1), the knowledge gap(s) in that territory(M2) and the contribution of the writer's proposed study to the knowledge gap(s) identified.

The findings that follow will first report at the move-pair level (M1-M2, M1-M3, M2-M3) within a subsection of the introduction text. The enactment of move pairs in EX and NE texts

will be compared to show how they differ in achieving their specific local rhetorical functions such as exposing gap(s) in the literature (M1-M2); showing a relationship between the literature and the writer's study (M1-M3) and justifying how the writer's study will be occupied or carried out (M2-M3). The aim of reporting these findings will be to show how EX and NE writers differed in the enactment of move pairs required to achieve specific local rhetorical functions that contributed to the macro-rhetorical argument goal of the introduction subgenre.

The next subsection of my findings chapter will report on a configuration of move sequences across subsections to compare the enactment of longer stretches of moves in EX and NE texts. The progression of sequences will be compared to show how the two groups of texts differ in their contribution to the construction of the global schematic structure that clearly demarcates the boundaries of the study's research territory (M1), the gap(s) in the territory required to justify the need for the writer's proposed study (M2) and the aspect of the gap(s) that will be occupied and if applicable how they will be occupied in the writer's proposed study (M3). The aim of reporting these findings will be to show how EX and NE writers differed in the enactment of longer stretches of move sequences required to progressively build a cohesive schematic structure to achieve the macro-rhetorical goal of justifying the need for the writer's proposed study.

An additional subsection is included on the findings of how the two groups differed in their execution of M2, the counterclaiming move typically associated with the demonstration of students' "ability to think critically" (Kwan, 2006, p. 46). The aim of reporting these findings will be to show how EX and NE writers differed in their frequency and use of the counterclaiming move that is often associated with CT.

5.1.1 Move pairs and their rhetorical functions.

EX and NE texts contrasted in how successfully move pairs (1-2, 1-3, 2-3) within the subsections in which they were enacted achieved their local rhetorical functions to contribute to the macro goal of justifying the writer's proposed research.

The findings in Excerpt 5.1A show that EX1B enacts an M1-M2 move pair successfully to achieve the goal of exposing limitations in the research territory.

Excerpt 5.1A: EX1B enacting move pairs M1-M2 successfully to expose a research gap

Excerpt 5.1A	Annotation
1.1.2 The study of <u>language shift</u>	language shift = topic of subsection heading
<u>Language shift</u> in both immigrant and non-immigrant communities has been the focus of much sociolinguistic research for a combination of related reasons… (M1)	language shift = topic of M1 propositional content
However, the great majority of <u>this research</u> has been <u>restricted</u> to the American, European and Australian <u>contexts</u>. (M2)	this research refers to topic of language shift research in M1 restricted = limitation of existing research
What are the factors most associated with Hakka (language) shift?	language shift = topic of research question

This is because the limitation (*restricted*) exposed in M2 refers to (*this* research) literature on the topic (*language shift*) covered in the research territory of the previous M1. This topic (*language shift*) is also the topic of the research question (w*hat are the factors most associated with Hakka [language] shift?*) of the writer's proposed study, making the gap exposed relevant to the macro goal of justifying the need for the writer's study on language shift.

Additionally, the move sequence is aptly located in a subsection entitled: *The study of language shift*, which signals the topic (*language shift*) and whose general implied purpose aligns with the rhetorical goal (the need for the study on language shift) enacted through the moves to come. The common topic (language shift) that relates the subsection heading, the moves in the move pair and the research question, and the coherence between the general purpose implied in the subsection heading and the rhetorical goal of the move-pair sequence to expose the research gap for the writer's study, contribute to the rhetorical effectiveness of the M1-M2 pair in this excerpt.

In contrast to the EX excerpt, the findings of the M1-M2 move pair in Excerpt 5.1B shows that NE2C is less successful in achieving the rhetorical goal to expose a research gap for their study.

Excerpt 5.1B: NE2C enacting move pair M1-M2 less successfully to expose a research gap

Excerpt 5.1B	Annotation
1.2.1 Importance of Writing Skills	writing = topic of subsection heading
Among the four language skills, writing is a very important skill (M1)	writing = topic of M1 propositional content
yet it is also the most neglected one (see reports by National Commission on writing, 2003). (M2)	it refers to writing research in M1 neglected = limitation of existing writing research
What are the effects of planning conditions […] and subplanning conditions […] on text quality, fluency, lexical complexity and Flesch reading ease…?	planning and subplanning conditions = topic of the research question

The gap (*neglected*) in M2 refers to a general research topic (writing[11]) in the research territory enacted through M1. This topic, however, does not refer to the topic (planning conditions and subplanning conditions) of the research question (*what are the effects of planning conditions […] and subplanning conditions [...] on text quality, fluency, lexical complexity and Flesch reading ease…?*), resulting in the exposure of a gap that does not relate to the writer's proposed study on planning and subplanning conditions in the writing process. The topic of the proposed research, which was apparently not considered in the enactment of the M1-M2 move sequence, renders the move sequence rhetorically ineffective to achieve the goal of exposing a gap to justify the proposed study on planning and subplanning conditions in the writing process. As the topic of the propositional content of moves in the excerpt do not cohere with the topic of the research question, the moves are not successful in achieving their rhetorical function.

The next pair of moves, M1-M3, function to show how relevant aspects of the literature relate to the writer's proposed study.

In the following Excerpt 5.2A, EX1B uses the move pair M1-M3 to show the relevance of the approach that researchers (*Gal, 1979; Li, 1994*) in the field mentioned in the research territory enacted through move M1, to the approach (*similar framework*) they plan to adopt in their own study, mentioned in move M3.

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[11] words and phrases underlined with a dotted line (xxxxx) refer to examples that support instances where cohesion is lacking.

Excerpt 5.2A: EX1B enacting move pair M1-M3 successfully to show how studies in the literature apply to their study

Excerpt 5.2A	Annotation
1.1.3 The study of <u>code-switching</u>	code-switching = topic of the subsection heading
Two European studies that have made use of such a complementary approach are Gal (1979) in her study of <u>language shift</u> in Oberwart, Austria, and perhaps more systematically, W. Li (1994) in his study of <u>language shift</u> among the Tyneside Chinese community in the UK. (M1)	language shift = topic of the M1 propositional content
It is one of the goals of the current study to utilise a <u>similar framework</u> to gain understanding of the sociolinguistic practices of a bilingual Asian community that is undergoing <u>language shift</u>. (M3)	similar framework refers to approaches in studies mentioned in M1 language shift = topic of the M3 propositional content
Research question What are the factors most associated with Hakka <u>maintenance and/or shift</u>?	language shift = topic of the research question

The congruence exhibited between the topic (*language shift*) of the move pair and the topic (*language shift*) of the research question (*what are the factors most associated with Hakka maintenance and/or shift?*) contributes to the rhetorical effectiveness of the M1-M3 move pair, as was the case in the earlier EX excerpt.

In addition, the relationship between the topic (*code switching*) of the subsection heading and the topic (*language shift*) in the moves and research question was established in an earlier section to provide the coherence required in this subsection for the moves pair to achieve their rhetorical goal. The excerpt also exhibits an alignment between the general purpose implied in the subsection heading (*the study of code-switching*) and the rhetorical goal of the move pair to show how studies in the literature on code switching relates to the proposed study on language shift. The move pair successfully achieves the goal of showing how an existing approach on code switching applies to the writer's study proposed on language shift.

In contrast to Excerpt 5.2A, the M1-M3 move pair in Excerpt 5.2B is rhetorically less effective. Though the excerpt exhibits topical (*classification*) congruence between moves M1 and M3 to show the relationship between the approach to advertising studied in the field signalled in M1 and the writer's own approach in M3, it is unclear how this rhetorical function serves the writer's study. This is because there is no research question to infer the specific area of

advertising the writer proposes to study. Further, it is unclear how the topic (*creative strategies*) signalled in the subsection heading (*creative strategies in advertising*) relates to the approach in advertising signalled by the topic (*classification*) in the M1-M3 move sequence enacted in the subsection.

The lack of coherence among the topic of the subsection heading, the moves in the move pair and the absent topic of the research question hinders the M1-M3 move sequence from achieving its intended rhetorical goal.

Excerpt 5.2B: NE2D enacting move pair M1-M3 less successfully to show how studies in the literature apply to their study

Excerpt 5.2B	Annotation
Creative strategies in advertising	creative strategies = the topic of the subsection heading.
Later, the Resnik and Stern's <u>classification</u> was applied to the study of magazine, newspaper, and radio advertising. (M1)	classification = topic of M1 propositional content
<u>Similar studies</u> were conducted in different parts of the world including United States (Laczniak, 1979; Stern et al., 1981; Healey and Kassarjian, 1983; Harmon et al., 1983; Chou et al., 1987), Australia (Dowling, 1980), Canada (Pollay et al., 1980), the United Kingdom (Tylor, 1983), Japan (Madden et al., 1986; Hong et al., 1987), China (Rice and Lu, 1988), India (Khan et al., 1991), South Korea (Keown et al., 1992) and Hong Kong (Chan, 1986). (M1)	similar studies refers to the use of classification system mentioned in the first M1 by others in the field
Resnik and Stern's <u>classification system</u> was adopted in <u>this study</u> due to its well-established baseline and tested reliability. (M3)	classification system = topic of M3 propositional content
No research question provided in the text	the reader has to work out that NE2D's study is about various aspects of advertising by reading the research aim and other parts of their introduction chapter

The final M2-M3 move pair functions to show what the writer's proposed study is about.

In Excerpt 5.3A, EX1A enacts move M3 to occupy the gap (*insufficient studies*) exposed in academic criticism literature enacted by M2. The proposed new study introduced in M3 is aimed at addressing this deficit (*gain an informed evidence-based understanding…of academic criticism*). The common topic (*academic criticism*) that relates the implied rhetorical goal of the subsection heading (*the gap in existing studies of academic criticism*), the rhetorical function of moves (to make explicit the gap the writer's study will occupy) and the writer's proposed research to obtain research-based input on how successful academic criticism is enacted, implied in the research question (*what moves manifest in successful enactments of academic criticism but are less frequently observed in less successful enactments?*), achieves the coherence required for move pair M2-M3 in this excerpt to make explicit the gap the

writer's study will occupy. As observed in previous successfully enacted move pairs, the topical coherence achieved among the subsection heading, moves and research question, and the coherence between the implied or explicit rhetorical goal of the subsection heading and the goal of the moves contribute to the rhetorical success of the M2-M3 move pair in this excerpt.

Excerpt 5.3A: EX1A enacting move pair M2-M3 to successfully to show the gap the writer's study will occupy

Excerpt 5.3A	Annotation
1.2.5 The gap in existing studies of <u>academic criticism</u>	academic criticism = topic of subsection heading
These studies have in general shed light on how academic criticism is an intricate verbal act that manifests along a cline from more covert to overt expressions depending on the social and rhetorical context in which it is enacted but they are <u>insufficient</u> for language educators such as General Paper teachers who have an interest in intervening in their students' specific <u>academic criticism</u> practices to help them improve…. (M2) The need to <u>gain an informed, evidence-based understanding</u> of the moves and evaluative meanings that characterize more expert enactments of <u>academic criticism</u> in General Paper essays is the impetus behind the <u>present study</u>. (M3)	insufficient = limitation of existing academic criticism research academic criticism = topic of M2 propositional content gaining informed evidence-based understanding = aim of proposed study academic criticism = topic of M3 propositional content
What moves manifest in successful enactments of <u>academic criticism</u> but are less frequently observed in less successful enactments?	academic criticism = topic research question topic

In contrast to Excerpt 5.3A, the rhetorical function of the move M2-M3 pair in Excerpt 5.3B from NE2C is less successfully enacted. Although M3 is enacted to make explicit the writer's proposed new study (*tentative models…can be established*) and occupies the gap (*weak…, inadequate… lack of "holistic understanding…"*) exposed in existing writing models in M2, the moves are positioned in a subsection that signals a conflicting rhetorical goal. The subsection heading (*significance of the study*) signals an implied M3 goal, which is generally expected to provide information about the writer's proposed study. This information should hence be logically placed after M1 and M2 subsection headings, which function to define the research territory and research gap(s) respectively. Move M2 hence does not belong in this subsection. As has been consistently shown in the previous excerpts, coherence between the

implicit or explicit rhetorical goal of a subsection heading and the rhetorical goal of a move sequence enacted within it is required to achieve the rhetorical effectiveness of move pair functions within the subsection in question.

Excerpt 5.3B: NE2C enacting move pair M2-M3 less successfully to show the gap the writer's study will occupy

Excerpt 5.3B	Annotation
1.4.2 Significance of the Study	significance = subsection heading signalling M3 propositional content
An examination of eight prominent <u>writing models</u> seems to reveal a <u>weak consideration</u> of cognitive processes in writing performance, <u>inadequate work</u> carried out on cognitive subprocesses in writing performance, and a <u>lack of "holistic understanding</u> of the effects of manipulating task variables on writing performance…." (M2)	writing models = topic of M2 propositional content weak consideration…, inadequate work…, lack of "holistic…" = limitation in existing research
Thus, I hope that through <u>this empirical study</u>, <u>tentative ESL writing models</u> that focus on the effects of manipulating planning conditions, pre-task, extended pre-task, free-writing, subplanning conditions, topic-given, topic-ideas given and topic-ideas-macrostructure given and revising conditions, revising with and without draft on text quality <u>can be established.</u> (M3)	writing models = topic of propositional content establishing tentative writing models = contribution of present study
What are the effects of planning conditions [...] and subplanning conditions [...] on text quality, fluency, lexical complexity and Flesch reading ease…?	planning conditions, subplanning conditions = topic of research question

To summarise, the findings in this section of comparable move patterns in two groups of texts reveal that following accepted move-sequence pairs (M1-M2, M1-M3, M2-M3), which is expected for the construction of a recognisable genre such as the thesis introduction, does not always achieve the target rhetorical goal of creating the research gap, showing a link between the literature and making explicit the writer's own work and contribution. The findings of each of the move pairs in EX and NE texts considered in this section, consistently show that the consideration of the propositional topic of the move sequence, of the topic of subsection/section headings, and of the topic of the research question, contributes to the logical coherence required for move pairs to achieve their rhetorical functions effectively. Further, the difference in the execution of move pairs in EX and NE texts showed that apart from the topical coherence mentioned in the preceding sentence, coherence between the goal of the subsection heading

(implied or explicit) and the rhetorical goal of move pairs was also necessary for these pairs to achieve their intended rhetorical purpose.

Table 5.2 presents a summary of the main rhetorical differences in the enactment of move-pair decisions in EX and NE texts.

Table 5.2

Differences in the Enactment of Move-Pair Decisions in EX and NE Texts

Areas of difference	EX texts	NE texts
Cohesion among topic of move pair, topic of subsection heading and research question required to achieve rhetorical goal of move pair	Adequate to achieve rhetorical goal of move sequence	Inadequate to achieve rhetorical goal e.g., topic of move sequence exposing gap in the literature was different from topic of research question
Cohesion between the implied or explicit rhetorical function of the subsection heading and the rhetorical function of the move pair required to achieve rhetorical goal of move pair	Adequate to achieve rhetorical goal of move sequence	Inadequate e.g., move enacting research gap inappropriately placed within subsection heading signalling moves related to the writer's proposed research
Sequencing of subsection headings within which move pair is enacted to achieve rhetorical goal of move pair	Adequate to achieve rhetorical goal of move sequence	Inadequate e.g., move pair enacted within subsection inappropriately sequenced within the text

The discussion in Section 5.2 will examine the question of what critical-thinking processes may account for the different outcomes in EX and NE texts with the same conventional move-pair patterns.

5.1.2 Move configurations and schematic structure.

When properly executed, the choice and sequencing of the right moves construct the schematic structure of the research thesis introduction, a structure that is readily recognisable as enacting a particular intention. In the case of the texts analysed in the current study, the intention is to argue the gap in knowledge found in existing literature in order to justify the need for the writer's proposed research. This section reports on findings that show how the extended sequence of move choices exhibited in EX and NE texts impacted the coherence of the schematic structure required to achieve the communicative purpose or argument of the introduction subgenre.

As mentioned in Section 5.1, though both EX and NE texts exhibited comparable move configurations on the "surface" (as was shown in Table 5.1), the schematic structure of EX

texts was tightly knit and cohesive while those of NE texts lacked cohesion and, in some cases, were highly fragmented. The findings showed that various permutations of move pairs (1-2, 1-3, 2-3) discussed in 5.1.1, in all EX texts, were largely logically linked across the whole text constructing an introduction subgenre that displayed the expected and clearly identifiable 3-move progression (Bhatia, 1993; Bunton, 2002; Kwan, 2006; Swales, 1990). The move progression clearly demarcated the study's research territory through move M1; the research gap(s) within that territory, through move M2; and the writer's proposed study, through the occupation of the relevant research gaps(s), through move M3; to justify how the writer's study was going to contribute to new knowledge. A clear and cohesive sequential progression of moves is essential for showing how the writer's proposed new study in M3 is linked to the relevant existing literature in M1 through the gaps(s) identified in M2, where M2 serves to justify the writer's proposed new study (Bhatia, 1993; Kaufer & Geisler, 1989; Swales, 1990).

In contrast to EX texts, all four NE texts displayed instances of incongruence in the execution of the various permutations of move pairs, resulting in a schematic structure that did not fulfil the rhetorical goal of arguing for the justification of the writer's proposed new research. The texts did not display a clearly demarcated research territory (M1), research gap(s) (M2) and the writer's proposed study (M3) achieved through move sequences that constructed the three parts of the macro argument reflected in a cohesive schematic structure. The excerpts that follow will be used to illustrate how EX and NE writers differed in their choice and execution of move sequences used to construct the schematic structure required to justify the need for the writer's proposed study.

Excerpts 5.4A, 5.4B and 5.4C from EX1B will be used as an exemplar of how move sequences were used to achieve the M1-M2-M3 progression across the excerpts to create a schematic structure that fulfilled the rhetorical goal of justifying the writer's proposed research.

The moves (M1-M2-M3) in each of the excerpts not only cohere within the excerpt but also across the excerpts.

In 5.4A the M1-M2-M3 sequence is executed successfully to justify the approach the writer will use to study language shift. The propositional content of each move refers to the same topic (*language shift*) and this topic refers to the topic of the subsection heading and to the topic of the research question. The moves achieve the rhetorical goal of justifying the approach suggested in M3 (*from this perspective…current study*) used to study language shift by exposing the limitations (*not necessarily found applicable to another*, *group behaviour… in*

effect an aggregate of choices) found in existing models and proposing a better approach (*take into consideration individual variation… more complete*) through M2 moves. The successful enactment of moves M1 and M2 in this excerpt contributes to M3, which is the territory of the writer's proposed study in the schematic structure of the introduction chapter.

Further, the instances of move repetitions contribute to building the demarcation of the move in question by contributing to its rhetorical goal. For example, the three M2 moves each contribute to building the research gap related to approaches used to study language shift. Each move M2 provides an evaluation (*not necessarily… applicable to another*, *group behaviour… an aggregate of choices made by individual members*, *individual variation… provide more complete picture*) that leads to the approach (*from such a perspective*) in M3 that the writer will use in their study. The general rhetorical purpose implied in the subsection heading (*the study of language shift*) also aligns with the rhetorical purpose of the move sequence (to justify the approach the writer will use to study language shift) located within it.

Excerpt 5.4A: EX1B enacting moves M1-M2-M3 within a subsection to justify the approach to study language shift

Excerpt 5.4A	Annotation
1.1.2 The study of <u>language shift</u>	language shift = topic of subsection heading
In order to understand the phenomenon of <u>shift</u>, most sociolinguistic studies of <u>language shift</u> have focused on identifying its probable causes and the factors most associated with promoting or hindering the process. (M1)	language shift = topic of M1 propositional content
Indeed, various models have been developed in an attempt to isolate a specific set of sociolinguistic and linguistic factors that can be used to predict the occurrence of <u>language shift</u>, incorporating such variables as age, gender, language attitudes, community size, the cultural distance between the majority and minority language and societal language policy (Romaine, 1989). (M1)	language shift = topic of second M1 propositional content
However, what has been found applicable to one particular community has <u>not necessarily</u> been found <u>applicable to another</u>. (M2)	not necessarily… applicable = limitation of existing models mentioned in M1
Although <u>language shift</u> is usually described as a community phenomenon, the <u>group behaviour</u> of abandoning one language in favour of another is <u>in</u>	language shift = topic of second M2 propositional content

effect an aggregate of the choices made by individual members of the community in question. (M2)	in effect an aggregate = flaw of existing approaches implied in M1
An account that takes into consideration individual variation and motivations is therefore likely to provide a more complete picture of language shift within a community. (M2)	language shift = topic of third M2 propositional content more complete picture… = evaluation of proposed approach to use for study of language shift
It is from such a perspective that the current study is carried out. (M3)	from such a perspective = approach to be taken in present study introduced in M3
What are the factors most associated with Hakka maintenance and/or shift?	language shift = topic of research question

The M1-M2-M3 sequence of moves in Excerpt 5.4B is about a different topic, code switching. The moves in the sequence are successfully enacted to justify the choice of code-switching framework the writer will use to study language shift. To maintain the coherence between this excerpt and the previous one, the relationship between the topic (*language shift*) of the previous subsection (*the study of language shift*) and the topic (*code switching*) of the present subsection heading (*the study of code-switching*) is established in the first M2 move of this excerpt. The writer establishes the logical relationship between the two topics in that move (*code-switching provides insight into the bilingual practices of a community undergoing language shift*). The other findings that contribute to the successful achievement of the excerpt's rhetorical goal are similar to those mentioned in the previous excerpt. They include the coherence achieved through the common topic (*code switching*) referred to in the subsection heading, the propositional content of moves and the research question of the study. Moves are also repeated purposefully to build the rhetorical goal of the move in question. For example, the second M2 move in the excerpt provides support of studies (*two European studies… use a complementary approach*) that have used the approach (*incorporate both a micro-level analysis… and a macro level analysis…*) mentioned in the first M2 move. The implied general purpose of the subsection heading (*the study of code-switching*) also aligns with the rhetorical purpose of the move sequence (to justify the choice of code-switching framework the writer will use to study language shift) located within it.

Excerpt 5.4B: EX1B enacting moves M1-M2-M3 to achieve coherence within and between two subsections

Excerpt 5.4B	Annotation
1.1.3 The study of <u>code-switching</u>	code-switching = topic of subsection heading
One of the most striking features of bilingualism is <u>code-switching</u>, the alternating use of two or more languages or language varieties in the same stretch of discourse (Auer, 1984a). (M1)	code-switching = topic of M1 propositional content
One strand of current <u>code-switching</u> research focuses on the interactional aspects of switching, which was first inspired by Gumperz' work on bilingual interactive strategies (e.g., Blom & Gumperz, 1972; Gumperz, 1982). (M1)	code-switching = topic of second M1 propositional content
Gumperz' interactional approach to <u>code-switching</u> was further developed by Auer (1984), but his model of bilingual conversation was based on a sequential analysis of conversational <u>code-switching</u> that focuses on the details of the ongoing interaction, in contrast to the classificatory approach taken by Gumperz, where the many functions of code-switching are merely presented as a list of categories. (M1)	code-switching = topic of third M1 propositional content
An account that incorporates both a micro-level analysis of the patterns and uses of <u>code-switching</u> among individual speakers and a macro-level analysis of language choice in different situations is likely to provide <u>more insight</u> into the bilingual practices of a community undergoing <u>language shift</u> than one that focuses only on the latter aspect, as most traditional research has done. (M2)	code-switching = topic of first M2 propositional content more insight = evaluation of strength of proposed code-switching approach code-switching and language shift = relationship between two topics established in this M2 move
Two European studies that have <u>made use of</u> <u>such a complementary approach</u> are Gal (1979) in her study of <u>language shift</u> in Oberwart, Austria, and perhaps more systematically, W. Li (1994) in his study of <u>language shift</u> among the Tyneside Chinese community in the UK. (M2)	language shift = topic of the second M2 propositional content such a complementary approach = refers to code switching which is the second topic of the M2 propositional content made use of = support for the code-switching approach mentioned in the previous M2 to contribute to the demarcation of this move M2

It is one of the goals of the current study to utilise a <u>similar framework</u> to gain understanding of the sociolinguistic practices of a bilingual Asian community that is undergoing <u>language shift</u>. (M3)	similar framework = refers to code-switching which is second topic of the M3 propositional content language shift = topic of the M3 propositional content similar framework = applies previous approach in M2 to present study in M3
What are the factors most associated with Hakka <u>maintenance and/or shift</u>?	language shift = topic of research question

The M1-M2-M3 sequence in the final Excerpt 5.4C in the EX text is successfully enacted to justify the need to study language shift associated with the Hakka language. This is achieved by exposing limitations (*little empirical research*) in the first M2 move and the need for the study (*further sociolinguistic inquiry would help*) in the fourth M2 move.

The link between this and the previous subsections is achieved in the fourth M2 move where the writer shows how the topics of each subsection logically relate to each other. In this move, the writer informs that their study examines language shift in the Hakka language (*the extent to which this threatened language variety is maintained or lost*). Additionally, the relationship between the study of language shift and code switching was established in the first M2 move of Excerpt 5.4B (*an account that incorporates… code-switching… provide more insight into… practices of a community undergoing language shift*). Taken together, the interrelationship of moves communicate that the writer's study uses code switching to study language shift in the Hakka language.

This excerpt also displays the topical coherence exhibited in the previous excerpts to achieve rhetorical success. Hakka, which is the topic of the subsection heading (*Research problem: The Hakka in Hong Kong*), is also the topic that gives coherence to the propositional content of the moves (M1-M2-M3) in this excerpt. Hakka is also the topic of the writer's research question (*what are the factors most associated with Hakka [language] maintenance and/or shift?*). Moves are repeated intentionally to build the rhetorical purpose of the move in question. For example, the third M2 move provides details (*homogenous, more or less identical*) of the study introduced in the second M2 move.

Additionally, though the subsection heading (*Research problem: The Hakka in Hong Kong*) suggests a general rhetorical purpose that aligns with the purpose of justifying the need for studying language shift through code-switching practices in the Hakka language, enacted by the move sequences within it, the writer opted to enact the occupation of the research gap through a move M3 in a new subsection (*Research aims and objectives*). This choice to enact

M3 in a new subsection maintains the coherence of moves established in the previous subsection and achieves the rhetorical goal of the move sequence (to justify the need to study language shift associated with the Hakka language) in this excerpt.

Excerpt 5.4C: EX1B enacting moves M1-M2-M3 to achieve coherence within and across three subsections

Excerpt 5.4C	Annotation
1.2 Research problem: The <u>Hakka</u> in Hong Kong	Hakka = topic of subsection heading
Recent years have seen an increase in scholarly research on various aspects of <u>Hakka language</u> and culture, especially in Asia. (M1)	Hakka = topic of M1 propositional content
However, <u>little empirical</u> research has been conducted on the use of <u>Hakka</u> in Hong Kong, in particular from a sociolinguistic perspective. (M2)	little empirical research from sociolinguistic perspective = limitation of current research on Hakka language. Hakka = topic of M2 propositional content
A language survey by Chow and Lau (2001) provided some useful indication of the status of <u>Hakka</u> in Hong Kong, while studies by Lau (2000, 2001b) have chiefly <u>focused on the historical or dialectological aspects</u> of <u>Hakka</u> in Hong Kong. (M2)	Hakka =topic of second M2 propositional content focused on historical… = evaluation of scope of existing research on Hakka
Lau showed that the <u>Hakka</u> variety that is spoken in Hong Kong is essentially <u>homogeneous</u> throughout the territory and is <u>more or less identical</u> with the <u>Hakka</u> that is spoken in neighbouring regions, including the border region of Shenzhen in mainland China. (M2)	Hakka = topic of third M2 propositional content homogenous, more or less identical = description of findings reported in previous M2
While census evidence points to a <u>rapid decline</u> in <u>Hakka</u> over the past century, <u>further sociolinguistic inquiry</u> would help explain how various factors at the societal and individual levels influence the extent to which this threatened language variety <u>is maintained or lost.</u> (M2)	rapid decline = continuation of a description of findings reported in the previous M2 moves Hakka = topic of fourth M2 propositional content further sociolinguistic inquiry = need in existing Hakka research Hakka and language shift (maintained or lost) = relationship between two topics established in this fourth M2 move
1.3 Research aims and objectives This study is informed by two complementary levels of sociolinguistic inquiry, the goal of which is to	Hakka = topic of M3 propositional content

provide an integrative account of the <u>bilingual language practices</u> of members of the <u>Hakka-speaking population</u> in Hong Kong. (M3)	bilingual language practices = implies the study of code-switching practices
What are the factors most associated with <u>Hakka (language) maintenance and/or shift</u>?	Hakka and language shift = relationship between two topics in research question

The move (M1-M2-M3) sequences of the three excerpts taken together contribute to a cohesive schematic structure that justifies the writer's research on the study of language shift in the Hakka community using a selected code-switching framework. The M1-M2-M3 sequence of moves cohere within and between subsections to identify various aspects of the gaps in existing literature associated with the writer's proposed research to justify the perspective used to study language shift, the framework of code switching selected to study it, and the need to study language shift in the Hakka language in the Hakka community, enacted in move M3.

The gaps identified in M2 associated with limitations in previous language shift studies, the code-switching framework and findings of empirical research on Hakka language, refer to the topics (language shift, code switching, Hakka language) of the literature introduced in the research territory, M1, and to the topics of writer's proposed research (what are the factors most associated with Hakka [language] maintenance and/or shift?). These topics were also signalled in the subsections within which moves are enacted. In addition, the interrelationship among topics was made explicit in various moves across the subsections. Further, the excerpts also exhibited cohesion between the implied goal of the subsection headings and the rhetorical goal of the move sequence enacted within them. The moves repeated within excerpts exhibit coherence in terms of contributing to a common local and global rhetorical goal and in terms of a shared topic in their propositional content.

In contrast to the EX excerpts above, which enact moves that contribute to a tightly knit cohesive schematic structure, the following NE excerpts display the enactment of moves that lack the cohesion required to construct the expected schematic structure to achieve the social/communicative goal of justifying the need for the writer's proposed study, as expected of the introduction subgenre. The three Excepts 5.5A, 5.5B and 5.5C, which follow, will be used to show why move sequences in NE texts do not achieve the schematic structure required to achieve the expected rhetorical goal of the subgenre.

The first of the three excerpts, 5.5A of NE1C, achieves its rhetorical goal of justifying how the writer will study task prompts. The excerpt exhibits characteristics of the findings discussed in EX texts. These include the display of topical cohesion (referring to *task prompts*) among the

moves in the M1-M2-M3 sequence and the research question required for achieving the rhetorical goal of the move sequence in the subsection; the exposure of a relevant gap (*did not examine*) in the first M2 move required to justify the writer's proposed approach of the study of task prompts, and the appropriate repetition of moves required to build the demarcation of the move in question. The purposeful repetition, for instance, of the second move M1, serves to provide support (*students' interpretation of… research paper… different from requirements of the task prompt*) to the claim made in the first M1 move that an understanding of task prompts has a possible effect on the writing of research papers.

Although the rhetorical purpose enacted by the M1-M2-M3 sequence, to justify how task prompts will be studied, generally aligns with the implied purpose of the subsection heading (*Rationale for the study*), this heading is located after a major subsection (*Context of the study*), which should logically be located after the rationale of the study. This is because the relevance of the information on the context of the study, which signals an M3 rhetorical purpose (to provide details for the writer's proposed study), can only be assessed by a reader after the rationale of the writer's study is established.

Excerpt 5.5A: NE1C enacting M1-M2-M3 within a subsection to justify the approach to study task prompts

Excerpt 5.5A	Annotation
1.3 Rationale for the study	
Task prompts – Writers' understanding of <u>task prompts</u> and task expectations are likely to affect the manner in which the research is carried out and how the research paper is written up. (M1)	task prompts = topic of M1 propositional content
For example, students' interpretation of the expected genre of the research paper might be different from the requirements of the <u>task prompts</u>… (M1)	task prompts = topic of second M1 propositional content
To understand the task requirements or the demands made of the students, researchers (Kroll, 1979; Swales, 1982; Bridgeman & Carlson, 1984; Horowitz, 1986a, b; Hale et al.; Carson, 2001; Moore & Morton, 2005) have examined the content, rhetorical structure, and linguistic features of <u>task prompts</u>. (This is described further in Chapter 3)… (M1)	task prompts = topic of third M1 propositional content

But while many of the above-mentioned studies took students perceptions of the <u>prompts</u> and the instructors' expectations into consideration, they <u>did not examine</u> student papers in order to analyse the possible relationship between the prompts and its impact on the discourse of the resulting papers. (M2)	task prompts = topic of M2 propositional content did not examine = limitation in existing task prompts research
…One study (Beck & Jeffrey, 2007) that <u>did examine</u> the relationship between <u>prompts</u> and the resulting papers looked at the mismatch of the benchmark papers with the requirements of the prompt. (M2)	task prompts = topic of second M2 propositional content
The researchers <u>studied the relationship</u> between the genre expectations implied in the <u>task prompts</u> and the genre of the papers written in response to these prompts… (M2)	studied the relationship = evaluative comment of existing task prompts research task prompts = topic of third M2 propositional content
The focus of the study was <u>different</u> from that of the present study and others reviewed in this thesis (and discussed further in Chapter 3) in that Beck and Jeffrey were examining what sorts of genres were specified in the writing prompts used in the high-stakes Scholastic Aptitude Test (SAT) in the United States as well as whether the benchmark papers reflected the requirements of the <u>prompt</u>… (M2)	different = evaluative comment of existing research task prompts = topic of fourth M2 propositional content
While this study differs in its focus, it informs my thesis as it shows that a structural analysis and analysis of the linguistic features of the <u>task prompts</u> can help to identify task expectations that can then be compared to the genre of the resulting research paper. (M3)	task prompts = topic of fifth M2 propositional content
What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?	task prompts = topic of research question

The M1-M2-M3 sequence in the second Excerpt 5.5B from NE1C does not achieve the goal of justifying why discourse structures should be examined or why the student's experience of writing should be considered in the study of task prompts. The topics introduced in the propositional content of moves do not always relate to one another. For instance, there is no

move showing how *discourse conventions*[12] in the first M1 relates to *structure, organise* and *framing* in the following three M1s. Subsequent to this, the relationship between topics that develop the problem that the research addresses is left unclear. It is unclear, for instance, how difficulties attributed to *moves, expressing evaluations...* in the second M2 relates to the claim of *understanding discourse conventions* in the third M2. As such, it is unclear how the writer came to the conclusion that the problems associated with *how to structure their papers* in the fourth M2 and *organise their ideas* in the fifth M2 are associated with the *lack* of knowledge of *how to use rhetorical moves* in the sixth M2. This excerpt lacks the topical cohesion evidenced in successful move sequencing discussed in earlier excerpts. The coherence across excerpts is, however, established between the topic (*discourse conventions*) signalled in the subsection heading (*Discourse conventions*) of this excerpt and the topic (*task prompts*) signalled in the subsection heading of the previous one, in the first move M1 (*to be able to interpret implied genre expectations, students need to understand the discourse conventions in their area of study*) of this excerpt. The relationship between task prompts and genre expectations (*analysis of... task prompts can help to identify task expectations that can then be compared to the genre of the resulting research paper*) was implied in the final move M3 of the previous excerpt.

Excerpt 5.5B: NE1C enacting moves M1-M2-M3 that lack coherence within and between two subsections

Excerpt 5.5B	Annotation
1.3 Rationale for the study	subsection positioned after subsection on context of study
<u>**Discourse Conventions**</u> – To be able to interpret implied <u>genre expectations</u>, students need to understand the <u>discourse conventions</u> in their area of study. (M1)	discourse conventions = topic of subsection heading genre expectations = relationship between discourse conventions and task prompts implied in genre expectations is found in the final M3 move of previous excerpt. discourse conventions = topic of M1 propositional content

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[12] Words and phrases underlined with a dotted line (xxxxx) refer to examples that support instances where cohesion is lacking

In a seminal paper, Bartholomae (1985) too points out that even students who write well need to learn how to write and <u>structure</u> their papers and to "learn to speak our language" (p. 273)… (M1)	structure = relationship between structure and discourse conventions is unclear
In a study that examined student essays written in response to task prompts, Spack (1988) called for writing instructors and university lecturers to provide more scaffolding for student writers to help them <u>organise</u> their ideas for their research papers. (M1)	organise = relationship between organise and discourse conventions is unclear
The difficulties students face, specifically in <u>framing</u> their papers, have been a recurrent theme in a number of studies of first-year student writing (Bartholomae, 1985; Perry-Woodley 1991; Harris, 1995; Yin, 2000; Leki & Carson's 1997; Schleppegrell, 2004). (M2)	framing = relationship between framing and discourse conventions is unclear
As these researchers show, novices face great difficulties in writing research papers. (M2)	
More specifically, developing writers have been noted to have difficulty in producing functional <u>Moves, expressing evaluations, stating assumptions, making comparisons, and stating causal relationships</u> (Schleppegrell, 2004). (M2)	
Among other reasons, this may be a case of writers not knowing or <u>understanding the conventions</u> of the genre. (M2)	conventions = relationship between understanding conventions in M2 and moves, expressing evaluations, etc. in previous M2 is unclear
In examining the role of writing centres and writing instructors as well as the needs of first-year university students, Harris (1995) found that the majority of students discussed approaching writing instructors for help as they did not know <u>how to structure their papers.</u> (M2)	
Likewise, Leki and Carson's (1997) study of students' experiences of learning to write research papers in order to make the transition from writing classes to other academic courses revealed the unexpected finding that several students stated finding it difficult to <u>organise their ideas</u> and structure their research papers. (M2)	

Given these recurrent findings, it is possible that students do not know how to use rhetorical moves to achieve the purpose of the task. (M2)	do not know how to use rhetorical moves = unclear how knowledge of rhetorical moves relates to structure paper and organise ideas
To achieve this, it will be necessary to examine the discourse structures used by experts…. (M3)	
However, the key factor in understanding student writing will be to take the students' experience of writing the papers and their motivations for using certain discourse features in to consideration in order to be able to address their needs and to help them overcome their perceived writing difficulties. (M3)	students' experience = unclear how students' experience relates to discourse convention which is the topic heading of this subsection
What do research project task prompts require of novice writers? What do novice writers understand of these requirements?	task prompts = topic heading of research question

The M1-M3 sequence of moves in the final Excerpt 5.5C from NE1C also does not achieve its rhetorical goal of showing how the study of students' experience in writing mentioned in the literature applies to the writer's own study of students' experience in writing.

The use of the term experience in *experience of students' learning to write research papers* in the first M1move, *shaped by the students' research experience* in the second M1 move, *use of experiential knowledge* in the third M1 move, and *narratives of personal experience* in the fourth M1 move do not share a common meaning, which is required to facilitate the coherence of the propositional content of these moves. This results in the disjointed M2-M3 sequence of moves that do not lead up to achieving their rhetorical goal of showing how the literature on students' experience in writing relates to their own study. Some measure of coherence across the three excerpts seems, however, to be established between the topics (*learning to write* and *research papers*) of the subheading of this excerpt and the topic (*experience of writing research papers*) in the final move M3 of Excerpt 5.5B, on the one hand, and the topic (*research paper*) in the second M1 move of 5.5A and fourth M2 move of 5.5B.

In view of the largely incoherent move sequences within Excerpts 5.5B and 5.5C, this measure of coherence across excerpts is insufficient to achieve the cohesive schematic structure required to fulfil the macro/global rhetorical goal of this text.

Excerpt 5.5C: NE1C enacting moves M1-M2-M3 that lack coherence within and across three subsections

Excerpt 5.5C	Annotation
1.3 Rationale for the study	
Learning to Write Research Papers –	learning to write = topic of heading of subsection
	learning to write = coheres with experience in final M3 of Excerpt 5.5B
	research papers = coheres with second M1 topic in 5.5A and fourth M2 topic in 5.5B
Researchers looking at the experience of students learning to write research papers have examined different approaches taken by students in writing different types of research assignments (Nelson, 1990; Macbeth, 2004; Fletcher, 2004; Berkenkotter et al., 1991; Rhodes, 1998; Nielsen & Rocco, 2002; Cho, 2005) (discussed further in Chapter 3). (M1)	experience of learning to write = topic of the M1 propositional content coheres with subsection on heading learning to write
All the studies reviewed above indicate that the student research paper is a separate genre and that the papers are shaped by the students' research experience. (M1)	research experience… = does not cohere with topic of experience of learning to write
But research in this tradition shows that student research papers have several unique features, including the use of experiential knowledge (Spigelman, 2001), and that the students struggle with the task of writing (Sommers & Saltz, 2004; Grobman, 2009). (M1)	experiential knowledge = does not cohere with topic of experience of learning to write
For instance, Spigelman (2001) argues that the 'telling of stories can actually serve the same purposes as academic writing, and the narratives of personal experience can accomplish serious scholarly work' (p. 64)… (M1)	narratives of personal experience = does not cohere with topic of experience of learning to write
To study the writing experience, the student's voice can be taken into consideration and the students' roles of being novice writers and researchers in the university will allow researchers 'inside students' learning' (Sommers & Saltz, 2004, p. 146) (M3) experience. (M3)	writing experience = topic of the M3 propositional content coheres with subsection on heading learning to write
This involves analysing both the writer's experience as well as the text produced by writers. (M3)	writer's experience = topic of the M3 propositional content coheres with subsection on heading learning to write

What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?	task prompts = topic of the research question
How do novice writers describe their <u>experiences</u> as research writers?	experiences = topic of the research question

The findings of the three NE excerpts which are representative of the texts in the NE sample show that the selection and sequencing of moves in these texts are distinctly different from the selection and sequencing of moves in EX texts. It was found that the move sequences in NE texts do not always contribute to building a cohesive schematic structure with clearly demarcated research territory, gaps and territory of the writer's proposed study. Move sequences were not always found to cohere with one another to achieve the schematic-move progression required to achieve the macro goal of justifying the writer's proposed research. This was because move sequences within and across excerpts did not always display topical coherence among the topic of moves, the topic signalled in the subsection heading and the topic of the research question. It was found that the relationship between new topics in the propositional content of moves was not clearly established in some instances (e.g., *discourse conventions, structure organise, framing, rhetorical moves* in Excerpt 5.5B) and in other instances, the topics in the propositional content which seemed to have the same form did not seem to have the same meaning (e.g., *experience of students learning to write research papers, students' research experience, experiential knowledge, narratives of personal experience*). Further, the sequencing of subheadings within the chapter was not always found to be logical.

Other texts in the sample, such as NE2C and NE2D, displayed disjointedness due to the inappropriate positioning of moves in subsections that signalled a rhetorical goal different to that intended in the move sequence and to unrelated propositional content in move sequences within and across subsections. An extreme case of disjointedness observed in part of a thesis introduction subgenre, resembled a glossary-like list that lacked cohesion between the items in the list and went on for three pages (shown below in Excerpt 5.6). The only text in the NE sample that seemed better structured, positioned a large segment of M1 at the end of the thesis chapter, contradicting the logical expectation of sequencing the progression of moves to construct a research territory before occupying it by exposing gaps in that territory.

Excerpt 5.6: NE2D's introduction subgenre segment resembling a glossary-like list of definitions

Excerpt 5.6	Annotation
Advertising as promotional discourse	
An advertisement is a 'public announcement' for a product, service, or idea through a medium to which the public has access…	definition associated with topic 1 on advertisement
An advertiser at a rate fixed or negotiated with the media usually pays for advertisements.	definition with topic 2 on advertiser
An advertisement is a form of persuasive communication with the public (Andersen, 1971; Barnes, 1975)…	definition associate with topic 1 on advertisement
The American Marketing Association defines advertising as, "any paid form of nonpersonal presentation of ideas, goods and services by an identified sponsor" (Bolen, 1984:16). An analysis of each element of this definition follows:	definition associated with topic 1 advertisement
Research question No research question provided in the text	the reader has to work out that NE2D's study is about various aspects of advertising by reading the research aim and other parts of the student's introduction.

Table 5.3 presents a summary of the main differences in the enactment of move-sequence decisions across subsection headings in EX and NE texts.

Table 5.3

Differences in the Enactment of Move-Sequence Decisions in EX and NE Texts

Areas of difference	EX texts	NE texts
Cohesion across subsection headings and moves enacted within to construct the expected schematic structure	Adequate to construct schematic structure required to fulfil the introduction's macro/global rhetorical goal	Inadequate e.g., topic of subsection heading and topics in moves enacted within it were not related
Cohesion across moves in subsection headings to construct clearly demarcated research territory, research gaps and the territory of the writer's proposed research	Adequate to clearly demarcate the research territory, research gaps and the territory of the writer's research through the progression of move sequence across the text	Inadequate e.g., topics of moves were not clearly related or signalled a different meaning to word forms that looked the same

5.1.3 Evaluation and M2 moves.

M2 in the 3-move sequence of the introduction serves a critical function in the establishment of the writer's research niche. One of the steps in this move is referred by genre analysts (Bunton, 2002; Kwan, 2005; Swales, 1990) as the counterclaiming step and is used in the schematic structure to expose defects (e.g., flaws, limitations, inconsistencies) in established knowledge claims or previous research. Counterclaiming is signalled through evaluative language (e.g., restricted, neglected, better, conflicting, did not explain, failed to), which is used by the writer to assess previous research (e.g., claims, methods, design) alluded to in M1, the research territory of the study. This move step of the M2 move is singled out for examination in this section because it overtly communicates a writer's epistemic evaluation of previous research claims and is typically taken to demonstrate the student's "ability to think critically" (Kwan, 2006, p. 46)

Table 5.4 shows that though EX texts on the whole display 1.1 times more use of counterclaiming M2 moves than NE texts, there are EX texts in the set such as 1B (2.1) and 2B (1.6) that exhibit a lower density of counterclaiming than NE texts such as 1C (2.6) and 2C (3.0) and 1D (6.5). This means that three of the NE texts display a higher density of epistemic evaluation than two of the EX texts.

Table 5.4

Density* of Counterclaiming Steps Occurring in EX and NE Texts

EX text	Occurrence of counterclaiming strategies in M2	NE text	Occurrence of counterclaiming strategies in M2
EX1A [MA]	6.0	NE1C	2.6
EX2A [MA]	4.5	NE2C	3.0
EX1B	2.1	NE1D	6.5
EX2B	1.6	NE2D	0.5
Mode	**3.3**		**2.8**

*Occurrence per 1000 words

Though the findings report a higher density of counterclaiming in some NE texts, the findings on counterclaiming analysed as the gap-indicating move in Sections 5.1.1 and 5.1.2 show that these moves are not necessarily effectively enacted to create the research niche for the writer's study. EX texts were more successful in enacting this move that exposes a gap(s) in existing research to justify the need for the writer's proposed study (i.e., create a research niche for the writer's study)

The findings, for instance, show that while EX1B in Excerpt 5.1A displayed a well-enacted move M2 to expose the research gap (*restricted*) needed to justify their study on language shift, NE2C in Excerpt 5.1B did not successfully enact a move M2 to expose a relevant gap for their study. The gap exposed in this excerpt related to general writing research rather to planning and subplanning conditions in writing-process research. Further, the gap associated with planning and subplanning conditions research was enacted in a section associated with an M3 goal, which conventionally enacts the significance of the writer's proposed study rather than the creation of the research gap for a study. This was reported in Excerpt 5.3B.

Other issues associated with the enactment of an effective M2 in NE texts such as NE1C, related to the inappropriate sequencing of the subsection heading within which M2 was enacted, as in Excerpt 5.5A, and the lack of clarity in how topics in M1 (*discourse conventions*) and M2 (e.g., *structure, organise, framing*) were related, as in 5.5B.

Table 5.5 presents a summary of the main differences in evaluation in M2-move decisions in EX and NE texts.

Table 5.5

Differences in Evaluation in M2-Move Decisions in EX and NE Texts

Areas of difference	EX texts	NE texts
Cohesion among topic evaluated in move M2, the topics of other moves in an excerpt and the topics of the subsection headings and moves across the text to successfully identify a gap in the research territory that is relevant to the writer's proposed research	Adequate to create an appropriate research gap	Inadequate to create an appropriate research gap e.g., M2 move topic does not cohere with topic or topics of M1 moves and the topic of the subsection heading
Cohesion between the rhetorical goal of the subsection heading and the rhetorical goal of the move M2 to successfully identify a gap in the research territory that is relevant to the writer's proposed research	Adequate to create an appropriate research gap	Inadequate to create an appropriate research gap e.g., M2 move located in subsection signalling M3 rhetorical purpose

5.2. Discussion: Critical Thinking in Move Decisions

This section applies the construct of CT developed in Chapters 2 and 3 to interpret how underlying critical thinking can contribute to the findings related to move choices that appear in the written texts presented in the preceding section.

It discusses how CT could account for the differences in the rhetorical effectiveness of move observed in EX and NE texts reported there. The labels for the CT processes are derived from the taxonomy of CT processes found in Appendix 2. The discussion is divided into how CT could account for differences in terms of the representation of the problem task, move-related decision making and move-related evaluation.

5.2.1 CT in task representation.

The analyses in Section 5.1 displayed a clear distinction between how EX and NE writers managed to solve the writing problem required to achieve the rhetorical purpose of the introduction subgenre. While EX writers' texts exhibited a distinct and clearly identifiable cyclical 3-move progression similar to that identified by other studies on the introduction subgenre (Bunton, 2002; Kwan, 2006), to achieve the goal of creating a research space for their study, NE writers' texts did not. This difference in the outcomes displayed by the two groups can be attributed for a start to how the writers in the groups represented the writing problem task (Flower & Hayes, 1981; Flower et al., 1990) of the genre they were expected to construct.

Solving the writing problem to achieve the successful construction of the introduction subgenre, as reported in EX texts in Section 5.1, would have involved the CT step of creating an accurate representation of the problem task writers were expected to solve (Flower & Hayes, 1981; discussed in Chapter 3, Section 3.2.1). One CT process likely to be involved in this step of constructing the demands of a writing task is the ability to screen or distinguish relevant from irrelevant information (Beyer, 1995; Sternberg, 1986) from the writing context. The process of differentiation would have involved the CT process of interpreting (Beyer, 1995; Facione et al., 1990; Raths et al., 1986) the demands of the sociocultural context using information from the writer's store of genre knowledge such as the expected schematic structure of the genre, the main three move functions that could be used to construct it and the macro/global rhetorical goal of the introduction subgenre (to convince the reader of the significance of their research; Bunton, 2002; Kwan, 2006; Swales, 1990). The CT process of differentiation (Beyer, 1995; Sternberg, 1986) would have required genre knowledge that would have helped the writer differentiate that the demands of the genre they were expected to write was an introduction subgenre rather than, among other genres, a business report, conclusion subgenre, glossary or a book review. It would also have helped writers differentiate that the move functions required to construct the target schematic structure were defining the territory of their research, exposing the gap(s) in this territory and showing the reader how the writer intended to occupy the gap(s) in their proposed study rather than, for instance,

introductory restatement, consolidation, practical implications and recommendations (Bunton, 2005) for the conclusion sub-genre or background information, reporting results, summarising results and commenting on results (Yang & Allison, 2003) for the discussion sub-genre.

Inadequate differentiation of genre information required to construct the problem representation of the target genre could account for contrasting outcomes of the introduction schematic structure found in EX and NE texts. Flower and Hayes (1981) and Flower et al. (1990) found that inadequate task representation has profound consequences on the outcome of the text constructed, as writers solve the problem they represent to themselves. The findings reported in Section 5.1 showed that NE2C (Excerpt 5.3B) located gap creation in a section signalling information related to gap occupation; NE1C (Excerpt 5.5A) located gap creation after presenting information about their own study rather than before it, as would be logically expected; and NE1D located the creation of the study's territory at the end of the chapter rather than at the start. In an extreme case, parts of NE2D (Excerpt 5.6) resembled a glossary rather than an introduction subgenre.

In addition to differentiating information to represent a problem task, task representation also involves representing the goals that will be used in text construction (Flower & Hayes, 1981, 1988; discussed in Section 3.2). This CT process requires the writer to state a desired goal or define a goal (Beyer,1985; Gubbins, 1985[13]) that translates relevant information in the task representation into the outcomes expected in the text constructing the target genre. A text goal (structural goal; Flower & Hayes, 1981) for constructing the argument structure of the introduction subgenre (discussed in Section 3.2.1), for instance, would direct the writer to fulfil the construction of a target schematic structure that would achieve its global rhetorical goal (to argue for the need of the writer's proposed study). This means, to develop the target schematic structure of an introduction, the text or macro-structural goal would direct the writer to enact moves (M1, M2, M3) that contribute to the macro structure or argument of the text. Interview data from the writers of texts EX1A and EX1B suggest the writers were aware of the CARS model and applied it to direct the construction of their introduction chapters.

> Interviewee (text EX1A): I try to apply Swales' CARS model: so I would establish the territory in 1.1.1.2, create a niche in 1.2.5, occupy the niche in 1.4.1.5, roughly… I need to take care of the discipline conventions.

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[13] The list of thinking skills compiled by Gubbins is presented in Sternberg (1986).

Interviewee of text EX1B: I guess I was probably following… I don't know if I was consciously following the CARS model. I actually taught a course like this. Introduce the CARS model to students

The texts constructed by both interviewees, as reported in Section 5.1, displayed a highly coherent and clearly demarcated research territory, research gap(s) and a contribution of their proposed study. The interview data also suggests though that students may not be aware that they are applying the model. While the writer of EX1A seemed to be consciously applying the model because they were aware of the conventions of the discourse community, the writer of EX1B did not share the same consciousness in the application of the model.

The repercussion of the absence or suppression of the operation of this text goal in favour, for instance, of a content goal such as to enact moves to develop the content of the research topic, rather than to fulfil its rhetorical goal, was observed in NE2C. In this text, where moves were enacted to develop the content of the genre rather than its rhetorical purpose, it was found that the structure of the introduction was divided into two unrelated halves that focused on developing different content knowledge. The first half of the introduction developed the content about writing research and the second informed the reader how the writer's proposed research on the planning conditions and subplanning conditions in the writing process would be carried out. As this text was not structured to achieve the expected goal of justifying the need to study planning conditions and subplanning conditions in the writing process in an introduction subgenre, it did not have a clearly demarcated research territory or research gap(s) required to justify the writer's proposed study. NE2C's problem of topic-centred rather than rhetorical-argument goal-oriented writing is not uncommon among novice writers. The writer of EX1A, who produced a very coherent and clearly structured text, reported in the interview that they had to be exposed to this form of thinking in composing and that it took them much practice and retraining to shift their approach from topic-directed to rhetorical-argument goal-centred writing, suggesting that writers need to acquire an awareness of rhetorical-argument goal-directed writing.

Interviewee (text EX1A): Rhetorical goal-directed composing and selection of linguistic resources was a long process of socialisation for me. I first encountered this concept in a 3rd year undergrad course on composition research taught by Dr C, my MA thesis supervisor, but 12 weeks was not enough to produce a substantial change in my composing process. I knew what was right to do, but would frequently fall back on entrenched habits of topic-centred composing rather than rhetorical-goal centred

The next section develops the discussion on how genre-oriented and goal-directed CT reasoning contributes to the differences in move-related decisions found in EX and NE texts.

5.2.2 CT as goal-directed and genre-oriented reasoning in decision making.

A close examination of EX and NE writers' move decisions suggests that the reasoning differed during decision making that resulted in the difference in rhetorical effectiveness of move choices aimed at achieving the communicative goal of the introduction subgenre. Applying the operation of the social-cognitive framework of CT (Flower, 1989, 1993, 1994) described in Sections 3.3.1 and 3.4 to the findings of move analyses, I present the differences in thinking inferred in the execution of moves in EX and NE texts to suggest how CT accounted for the differences observed.

The differences in thinking inferred in the findings of EX and NE move choices in Section 5.1.1 are first discussed at the move-pair level before the findings of Section 5.1.2 are discussed at the macro-structure level of the text. The rationale for this organisation is to show the complexity of CT reasoning during decision making, which considers information progressively from a move-pair level, to a subsection or section level (depending on how the writer structures their introduction) and eventually to the level of the schematic structure of the chapter.

The functions reported in Section 5.1.1 at the move-pair level include exposing a research gap for the writer's study (M1-M2), occupying the gap (M2-M3) and showing a link between information in move M1 and the writer's own study in move M3 (M1-M3). The enactment of each move in the pair requires genre awareness, which allows the writer to anticipate or predict the reader's expectation (social expectation of the research community) of the rhetorical goal of the genre being constructed and to select the appropriate move-pair sequence to achieve this macro- or global rhetorical goal. The CT processes likely to be involved in the enactment of move pairs during text construction are the CT process of anticipating or predicting the reader's expectations of the genre (Raths et al., 1986) and the CT process of selecting from alternative move choices (Gubbins, 1985), facilitated by the CT process of applying to the higher level macro/global goal (Flower & Hayes, 1981; Halpern, 1998), to argue for the significance of the writer's proposed study. According to Swales (1990), the higher or macro-rhetorical goal is used to vet the choice of move, language and propositional content, suggesting that the macro-rhetorical goal that directs the decision making of moves operates in collaboration with other CT processes. With reference to the three processes: anticipating, selecting and applying, it can

be interpreted that the CT process that anticipates the reader's genre expectation shapes the macro goal (Flower, 1989, 1993, 1994), which in turn is applied in directing the CT process that selects a move sequence with a local goal that aligns with the text's macro-rhetorical goal. Move-decision making in text construction is genre oriented and goal directed.

The findings in Section 5.1.1 show that both EX and NE writers use the three-move pair functions to execute the respective local rhetorical functions required to contribute to the macro-communicative purpose of the genre, exhibiting to some degree goal-directed and genre-oriented CT reasoning. The writers of NE texts, in comparison to the writers of EX texts, however, do not seem to execute the move-pair functions successfully to achieve rhetorical success suggesting the possible absence or suppression of other CT processes required to facilitate successful execution. The findings strongly suggest the lack of engagement in CT processes such as inferring logical relations or seeing links between categories (Sternberg, 1986) and interrelating categories or constructing new links (Beyer, 1995) guided by the rhetorical goal of the text, accounts for lack of rhetorical success in these move pairs.

In Excerpt 5.1B, for instance, the gap exposed by the writer about general writing research has no bearing on the topic of the research question, which is on the planning conditions and subplanning conditions in the writing process. The CT processes of inferring logical relations and interrelating categories guided by the macro/global rhetorical goal of the text would have enabled the writer to infer and construct the appropriate bearing between the topic of the research gap and research question. Similarly, the apparent lack of engagement of these CT processes can be observed in the lack of bearing in Excerpt 5.2B between the topic (*creative strategies*) of the subsection heading and the topic (*classification system*) of the gap exposed, and in Excerpt 5.3B, the lack of bearing between the rhetorical goal of providing information about the territory of the writer's proposed study signalled in the subsection heading (*significance of the study*) and the rhetorical goal of exposing a gap in the territory of existing research signalled in move M2 located within the subsection.

Next, the CT processes contributing to the enactment of the progression of three basic moves (M1-M2-M3) across a broader segment of text, to construct the macro-schematic structure of the introduction that justifies the writer's proposed research, will be discussed. The findings in Section 5.1.2 of EX and NE excerpts showed a marked difference in how move selection and sequencing achieved a cohesive schematic structure with clearly demarcated research territory, research gaps and territory of the writer's proposed research, to fulfil the macro/global

rhetorical goal of the introduction genre. Two more CT processes in addition to those discussed in the move-pair findings can be inferred to account for differences in the rhetorical success of these two sets of excerpts.

To achieve the interconnectedness across subsection headings of moves with the same rhetorical function such as move M2 (creating the research gap) for three topics (*language shift, code switching* and *Hakka language*) displayed in the subsection headings of Excerpts 5.4A, 5.4B and 5.4C, the CT processes of inferring logical relations or seeing links between categories (Sternberg, 1986) and interrelating categories or constructing new links (Beyer, 1985) guided by the local rhetorical goal of the move in question and the higher level macro/global goal of the text was likely in operation. The operation of these processes would have first entailed the recognition of the logical interconnection among the three topics (*language shift, code switching* and *Hakka language*) in three different subsection headings and the establishment of the interrelationship among them in specific moves within the respective subsections. The findings of Excerpt 5.4B showed that the interrelationship between code switching in this excerpt and language shift in Excerpt 5.4A was established in the first M2 move of Excerpt 5.4B, and the interrelationship between Hakka language and language shift was established in the fourth M2 move in Excerpt 5.4C. Further, the operation of the two CT processes would likely also have ensured the coherence among the three topics of the subsection heading, the topics of the moves enacted within each subsection and the topic of the research question, to clearly demarcate the research gaps related to language shift (e.g., *not necessarily… applicable to another*), code switching (e.g., *more insight*) and the Hakka language (e.g., *little empirical research*) that constructed M2 across the excerpt.

The suppression or lack of use of operations such as inferring logical relations and interrelating categories could likewise account for the incoherence observed in NE Excerpts 5.5A, 5.5B and 5.5C. Although it appeared that these operations played a part in achieving some level of cohesion that linked the three topics (*task prompts, discourse conventions* and *learning to write research papers*) in selected moves within each excerpt, the processes did not appear to achieve the connection among the topic of moves within the excerpts, between the topic of moves and the topic of the subsection headings, and between the moves and the research question. The findings show that the interrelationship between the topics (*task prompts* and *discourse conventions*) in the heading of Excerpts 5.5B and 5.5A seem to be established in the first move M1 of Excerpt 5.5B. There is, however, a breakdown in the link between the topic *discourse conventions* of the subsection heading and terms like *structure, organise* and *framing* of the

M1 move sequence within the excerpt. The problem of the breakdown in the relationship between the topic of the subsection heading and the topic of moves persists in Excerpt 5.5C. In this excerpt, however, the breakdown in the link is likely to have been caused by the lack of or suppressed engagement in two other CT processes such as comparing, distinguishing or differentiating (Raths et al., 1986) the meaning between topics that appear to have the same form (e.g., *experience* in students learning to write research papers and *narratives of personal experience* in scholarly work) and recognising instances of their invalid and unjustified use (Ruggieri, 1984, p. 63).

In addition to the preceding CT processes, other CT processes such as generating detailed ideas or elaboration (Gubbins, 1985) and giving reasons to support a conclusion (Halpern, 1998) are likely to be in operation in decisions that enact repeated move functions. For instance, in Excerpt 5.4B, the first three M1 moves were enacted for the purpose of elaborating on code-switching research to build the research territory. In the same excerpt, the writer also chooses to repeat the M2 function with the purpose for the second M2 move to provide supporting evidence (*two European studies… made use of such a complementary approach*) for the claim made in the first M2 move (*an account that incorporates…provide more insight*).

The next section discusses the CT process of evaluation in text construction with a specific focus on move M2.

5.2.3 CT as evaluation in the enactment of move M2.

The CT process of evaluation is reflected in the evaluative language in the counterclaiming move M2 and signals the evaluation of arguments or claims (Beyer, 1995; Bailin et al., 1999a, 1999b; Facione et al., 1990; Gubbins, 1985) made in the literature introduced in move M1 (the research territory). As mentioned previously, counterclaiming is a critical move in the introduction subgenre as it creates the research gap required to justify the writer's proposed study. CT theorists (Burbules & Berk, 1989) refer to this CT process as epistemic evaluation; the term epistemic refers to making judgements about the validity of truth assertions. Epistemic evaluation is also the normative-evaluative component of the CT construct described in Chapter 2.

Evaluation as a CT process is purported by theorists to comprise a range of CT subprocesses such as identifying components of arguments, judging credibility of evidence, identifying unstated assumptions, detecting bias, identifying logical fallacies, recognising logical inconsistencies in a line of reasoning, among others (Beyer, 1995; Ennis, 1987). The direction

of the evaluation taken (positive or negative evaluation) to enact the counterclaiming step successfully is guided by other CT processes such as applying the higher level macro/global rhetorical goal (Flower & Hayes, 1981; Halpern, 1998), which, in the introduction subgenre, is to argue for the significance of the writer's proposed study. Typically, the direction of evaluation of an entity in a gap creation move is negative.

The findings from Excerpt 5.1B suggest that evaluation expressed in the counterclaiming move to expose a research gap in text construction, operates in collaboration with other CT processes such as inferring logical relations and interrelating categories. If any of these processes is suppressed or absent, the result is likely to be a lack of congruence between the evaluation of the topic of the gap exposed (*writing*) and the topic of the research question (*planning conditions and subplanning conditions* in the writing process). Further, other NE excerpts such as 5.5B and 5.5C suggest the need for engagement in additional CT processes such as distinguishing or differentiating (Raths et al., 1986) the meaning between topics that appear to have the same form (e.g., *learning experience* versus *experiential knowledge*) and recognising instances of their invalid and unjustified use (Ruggiero, 1984, p. 63; e.g., *experience* in students learning to write research papers and *narratives of personal experience* in scholarly work) for evaluation in the counterclaiming move to achieve the rhetorical goal of exposing a research gap. The lack of engagement in these processes is likely to result in a lack of coherence among the topic evaluated in the move in question, the topics of other moves in an excerpt and the topics of the subsection headings across the text, as evidenced in Excerpts 5.5B and 5.5C. Finally, the findings also suggest that the process of evaluation is also executed in collaboration with CT processes that infer logical relations and interrelated categories such as the rhetorical goal of a subsection and the rhetorical function of a move as observed in Excerpt 5.3B, where move M2 was inappropriately enacted in a subsection signalling move-M3 rhetorical function.

Apart from the process of CT as epistemic evaluation, writers are likely also to engage in the process of CT as non-epistemic evaluation. This process involves evaluating a solution to assess how good the result is (Hayes, 1981; Halpern, 1998; Voss, Greene, et al., 1993). It involves assessing the reasoning process that led to the move decision in question by considering if it met all the considerations (e.g., coherence among the topic of the move, the topic of the research question and topic of the subsection heading; coherence of moves within and across subsection headings; coherence between the implied or explicit purpose of the subsection heading and the move in question) required for it to successfully contribute to the macro/global rhetorical goal of the text.

The CT process of non-epistemic evaluation, unlike epistemic evaluation, should ideally be occurring not only in move M2 but in all problem-solving decisions as purported by problem-solving theorists (Hayes, 1981; Voss, Greene, et al., 1993). It is the final step in the problem-solving process as described in Section 2.4. and Section 3.6.

5.3 Summary

This chapter has reported on the findings of move analysis in EX and NE texts. It was found that the two groups of texts differed markedly in the execution and sequencing of moves. Move choices in EX texts constructed a coherent schematic structure that resembled the introduction subgenre, which achieved the macro/global rhetorical argument or purpose of justifying the writer's proposed study. Move choices in NE texts, on the contrary, resulted in varying degrees of incoherence in the schematic structure constructed, which generally did not achieve the macro/global argument rhetorical goal of the introduction subgenre.

The discussion on the differences observed in the rhetorical outcome of moves that resulted in the schematic structure displayed in EX and NE texts strongly suggests that CT, which is a highly complex process in text construction, largely contributes to the differences observed. Specifically, the differences in the rhetorical effectiveness of move choices was attributed to the suppression or lack of engagement of one or more CT processes that operated collaboratively with other CT processes in the execution of the move choices in question. Repeated processes that were found lacking, and which appeared to contribute to much of the incoherence observed in NE texts, were the processes of inferring logical relations and interrelating categories.

The list of some of the CT processes inferred to have collaboratively contributed to the enactment and sequencing of move decisions are:
- Distinguishing relevant from irrelevant information
- Stating or defining a desired goal
- Interpreting information using background knowledge
- Anticipating or predicting expectations
- Selecting from alternative move choices
- Applying higher rhetorical goal to vet decisions
- Distinguishing or differentiating meanings that have the same form
- Recognising instances of invalid or unjustified use of meanings
- Inferring logical relations

- Interrelating categories

- Generating detailed ideas (elaboration)

- Giving reasons to support a conclusion

- Epistemic evaluation (e.g., identifying components of arguments, judging credibility of evidence, identifying unstated assumptions, detecting bias, identifying logical fallacies, recognising logical inconsistencies in a line of reasoning)

- Non-epistemic evaluation (e.g., assessing the reasoning that resulted in move choices by assessing the coherence among the topic of the move, the topic of the research question and topic of the subsection heading; assessing coherence of moves within and across subsection headings; assessing coherence between the implied or explicit purpose of the subsection heading and the move in question)

Chapter 6

Findings and discussion on citation use

This chapter continues from Chapter 5 and reports[14] on genre features analysed in EX and NE texts. Specifically, it reports on how EX and NE texts differed in the rhetorical effectiveness of the use of citations and how CT could have accounted for the difference in rhetorical quality observed on the basis of the theoretical construct of CT developed in Chapters 2 and 3. As was the case in Chapter 5, rhetorical effectiveness was determined in terms of the considerations made in arriving at citation choice decisions that achieve the rhetorical purpose of the citation in question during text construction (as described in section 4.3.3). The discussion on how CT could account for surface differences observed in the rhetorical quality of citation choices was based on the implicit link between CT and writing, and interpreted using the construct on the nature and role of CT developed in Chapter 2 and 3. The interpretation involved extrapolating the underlying thinking processes/behaviours (as discussed in section 2.5)related to how decisions on citation functions were made during problem solving and evaluation of citation choices in the construction of texts.

The chapter is divided into two main parts. Section 6.1 reports on the findings of citation use and Section 6.2 discusses the findings. The findings in 6.1 are further divided into two subcategories. Section 6.1.1 reports on what the quantitative data shows about the difference in the density, range and rank order of citations used in the EX and NE texts. Section 6.1.2 reports on what qualitative GA shows about the rhetorical differences in the three most commonly used citations in the two groups. Section 6.2 is subdivided into three subsections. Section 6.2.1 discusses how CT could contribute to the selection and use of attributive citations. Section 6.2.2 discusses how CT could contribute to the selection and use of evaluative citations. Section 6.2.3 discusses how CT could contribute to the selection and use of application citations. Interview data is used to complement the discussion of CT processes inferred in the enactment of citations where the data was available.

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[14] Segments of excerpts reported in the findings and discussion sections are italicised.

6.1 Findings: Citation Choice and Use in EX and NE Texts

This section reports on citation functions, the second generic feature analysed in this study. The choices of citation functions used by EX and NE writers, such as move choices, also reveal something about how CT can be responsible for successful writing. This is because decisions to select and use citations to execute various purposes in argument construction, such as to use them attributively to display knowledge, or to use them rhetorically to expose a knowledge gap or to support a claim, for instance, can indicate the mental processes that differentiate critical thinking from less or uncritical thinking.

The findings report on the observable patterns of citation functions identified in EX and NE texts where the functions observed are considered outcomes of intentional decision making that was required to solve the writing problem on what citation to use and how, in the construction of the writer's argument of the claim of significance (i.e., the claim for the need of the writer's proposed study) for the introduction subgenre.

Section 6.1.1 reports on the difference in density and rank order of the various citation functions occurring in EX and NE texts. The following Section 6.1.2 reports on how the citation functions in EX and NE texts differ in their rhetorical effectiveness. Section 6.2 then discusses what thinking processes characterised as CT could have contributed to the differences observed.

6.1.1 Citation functions in EX and NE texts.

Table 6.1 provides an overview of citation functions found in the introduction chapter of EX and NE texts.

Table 6.1

A Comparison of Citation Function Densities* in EX and NE Texts

Citation Functions	EX	NE	Comparison
Evaluation	14.1	12.2	EX is 1.6x more than NE
Attribution	10.2	11.7	NE is 1.2x more than EX
Application	9.1	4.5	EX is 2.7x more than NE
Establishing links between sources	8.1	5.4	EX is 1.2x more than NE
Exemplification	4.8	2.1	EX is 3.3x more than NE
Statement of use	1.3	1.0	EX is 1.5x more than NE
Comparison	1.5	0.12	EX is 1.1x more than NE
Further reference	0.07	0.03	EX is 2.3x more than NE
Total	**49.17**	**37.05**	**EX is 1.3x more than NE**

*Occurrence per 1000 words

Table 6.1 shows that EX writers use 1.3 times more citations than NE writers. The range of citations used in both groups of texts is similar. EX writers use more of all citations except for attribution, with some citations (application, exemplification, further reference) occurring more than double in EX texts.

The functions presented in Table 6.1 are divided (using bold lines) into three segments based on the density of citation functions occurring in the texts. The top two functions in both EX and NE texts were evaluation and attribution. The next two ranks of functions occurring in the second segment were application and establishing links.

The lower densities of functions appearing in the final segment of both EX and NE texts include exemplification, statement of use, comparison and further reference.

Table 6.2 displays the distribution of citation functions in individual texts. The median scores indicate that EX texts generally tend to use more complex citations in terms of the rank order and density of use. The use of attribution, a less complex citation function ranks third in EX texts with a density of 2.4. The same function in NE texts ranks second with a higher density of 2.9. A noteworthy observation in some individual texts is that in some cases, the density of occurrence of citations in NE texts is the same or higher than the occurrence of the same function in EX texts. NE1C (2.6), NE2C (2.7) and NE1D (6.4), for example, have a higher use of more complex evaluation citations than EX1B (2.1) and EX2B (1.6); and EX2B (4.8) and NE2C (4.8) have the same density of less complex attributive citations. There are also two examples of EX texts (EX1A and EX2A) that use a narrower range of citations than NE texts (NE1C and NE1D).

Table 6.2

Density* of Citation Functions in EX and NE Texts

Citation function	Density	Density	Density	Density	Median	Density	Density	Density	Density	Median
	EX1A	EX2A	EX1B	EX2B		NE1C	NE2C	NE1D	NE2D	
Eval	5.9	4.5	2.1	1.6	3.3	2.6	2.7	6.4	0.5	3.0
Attr	1.6	0.5	3.3	4.8	2.4	1.6	4.8	1.3	4.1	2.9
Appl	3.2	2.5	0.6	2.8	2.6	1.3	0.0	1.3	1.9	1.1
Est links	0.3	2.5	2.1	3.2	2.0	0.7	2.0	1.3	1.4	1.3
Exempl	0.5	0.0	1.5	2.8	1.2	0.2	0.2	1.0	0.7	0.5
St of use	0.0	0.0	0.9	0.4	0.3	0.2	0.0	0.3	0.5	0.2
Comp	1.1	0.0	0.0	0.4	0.3	0.2	0.0	0.6	0.0	0.2
Fthr ref	0.0	0.0	0.3	0.0	0.07	0.0	0.09	0.0	0.0	0.02

Given that EX texts tend to use more citations and a higher density of complex functions and that there are exceptions in the use of individual citations within texts in the two groups, the next section examines how EX and NE texts differ in the rhetorical effectiveness of citations used. The rhetorical effectiveness of a citation in this study refers to the various choices and uses of cited sources deployed to successfully achieve the rhetorical-argument goals of the introduction subgenre. The findings on rhetorical effectiveness will be discussed in terms of how NE texts compare with EX texts in the three most commonly used citations functions (attribution, evaluation and application) shown in Table 6.2.

6.1.2 Citation functions and their role in achieving rhetorical goals.

This section compares the rhetorical effectiveness of attribution, evaluation and application citations in EX and NE texts in terms of how they contribute to the construction of the macro goal of the claim of significance of the writer's proposed study (i.e., the goal of justifying the need for the study).

Attribution in the introduction chapter is used predominantly to build the relevant research territory within which the writer's proposed research will be situated. Citations are used attributively to acknowledge literature that is selected to provide information to serve this local rhetorical-argument goal. The effective fulfilment of this local rhetorical function in turn contributes to the macro/global rhetorical-argument goal of justifying the need for the writer's research. EX and NE attributive citations in general differ in terms of how writers use knowledge from sources to serve the rhetorical purpose of building the research territory for their proposed study.

Excerpts 6.1 and 6.2 provide an example of how the use of attribution in EX and NE texts can differ rhetorically.

The attributions used by EX1B in Excerpt 6.1 are rhetorically effective. They contribute to building the research territory about language shift in a bilingual community. This territory is relevant to the writer's proposed research on language shift in the Hakka community (a bilingual community) based on the information provided in the research question (*what are the factors most associated with Hakka [language] shift?*).

The first two citations on bilingualism in Excerpt 6.1 are used attributively to provide information on the bilingual process (*four stages of bilingualism*) and its occurrence (*classic*

pattern) in communities said to be bilingual. The information provided purposefully serves to build the research territory for the writer's proposed study on language shift in a bilingual community. This purpose becomes explicit when the relationship between bilingualism and language shift is established in the phrase *when minority and majority languages… lead to language shift*. The attributive citations about bilingualism in this excerpt are hence rhetorically effective because they contribute to the building of a research territory that is relevant to the writer's proposed study on language shift in a bilingual community.

Excerpt 6.1: EX1B's effective use of attributive citations to build a research territory

Excerpt 6.1	Annotation how attributive citations are used to build knowledge required for the study's research territory
1.1.1 The study of bilingualism: A variable and dynamic phenomenon	
According to Kornakov (2001), among bilingual individuals, it is possible to distinguish four stages of bilingualism: the establishment of bilingualism, established bilingualism, the losing of bilingualism and lost bilingualism. (attribution) (M1)	citation providing information about the bilingual process in individuals
The same may be said of a bilingual community. (M1)	information about process introduced earlier generalised to bilingual communities
Romaine (1989) describes the classic pattern as a once monolingual community becoming transitionally bilingual as a stage on the way to the eventual extinction of its original language. (attribution) (M1)	citation used to provide/build knowledge about how the bilingual process occurs in a community
When minority and majority languages are used in the same social contexts, this is likely to lead to language shift, defined by Weinreich (1953) as the change from the habitual use of one language to that of another. (application) (M1)	claim relating the bilingual process introduced earlier to language shift this claim exposes how the knowledge presented in the preceding attributive citations contributes to building the research territory on language shift (the topic of the research question in this study)
Societies which have maintained the use of their disparate languages for many generations might appear to be in a stable state of bilingualism but as Chambers (2003) notes, stable bilingualism is a relative term because language changes constantly, as do the social circumstances it serves. (application) (M1)	
This is evidenced in the example of Oberwart, a community which eventually shifted to German	

monolingualism in spite of sustaining a state of bilingualism in Hungarian and German for at least four centuries, due to social change in the community (Gal, 1979). (exemplification) (M1)	
Research question What are the factors most associated with Hakka (language) shift?	claim of significance: to justify the need for a study on language shift on Hakka

Excerpt 6.2 from NE2C, in contrast to Excerpt 6.1 from EX1B, is an example of a less rhetorically effective use of attribution. The attributions in the excerpt provide information about the genre approach as a solution to writing difficulties. This information, however, does not contribute to building a research territory that should be relevant to the writer's proposed study on the effects of planning and subplanning conditions on the writing process, as indicated in the research question (w*hat are the effects of planning conditions [...] and subplanning conditions [...] on text quality, fluency, lexical complexity and Flesch reading ease...?*)

The first two attributive citations in Excerpt 6.2 name genre theorists (*Swales, 1990; Halliday, 1985, 1994...*) and provide information on the origins of the theory (*three main schools of thought*). The information, however, bears no relationship to the writer's proposed research on planning and subplanning conditions and hence does not contribute to building the relevant research territory for the writer's study. The remaining attribute citations in this excerpt provide information on studies that have employed, with positive outcomes, methods related to the genre-pedagogical approach. The information provided in the citations (e.g., studies by *Schleppegrell, 2004; Cheng, 2008; Chandrasegaran & Yeo, 2006; Pang, 2002*) continues to lack the necessary bearing on the writer's study on planning and subplanning conditions in the writing process, required to build a relevant research territory for it. The use of attribution in this excerpt is rhetorically ineffective in building a research territory for the writer's proposed study.

Excerpt 6.2: NE2C's less effective use of attributive citations to build a research territory

Excerpt 6.2	**Annotation:** information presented in attributive citations does not contribute to building the research territory of the writer's proposed study
1.2.3 Current Solutions to Writing Difficulties	
First, genre approaches to teaching of writing have been advocated by some researchers such as Swales (1990), Halliday (1985, 1994), Hyland (2003, 2004,	citations providing information on genre theoretical approach to teaching writing

2007), Schleppegrell (2004) and Christie (1998) (attribution) as they have promised many benefits to learners (see Christie & Martin, 1997; Hyland, 2003, 2004, 2007). (further reference). (M1)	who advocated the approach promised benefits
Genre theory arises from three main schools of thought, Systemic Functional Linguistics, English for Specific Purposes (ESP) and New Rhetoric approach (Hyland, 2003; Johns, Bawarshi, Coe, Hyland, Paltridge, Reiff & Tardy, 2006). (attribution) (M1)	citations providing information on the origins of genre theory no link made between genre theory and the writer's own research on the effect of planning conditions on the writing process
Genre approaches to teaching of writing involve a discourse analysis of texts to illustrate how language is used to achieve the social purpose of the context. (M1)	citations providing information on the methods employed in genre pedagogy and research findings on the positive results of the genre approach no statement or indication made, however, on the relevance of genre pedagogy or its effects on the writer's specific research territory on planning conditions in the writing process
For example, Schleppegrell (2004) (exemplification) has illustrated how field, mode and tenor of texts were constructed to realize ideational, interpersonal and textual functions of texts. (M1)	citation used to illustrate how genre approach has been applied
The explicit pedagogies in genre-based teaching of writing involve building the context, modelling and deconstructing of texts, analysing the language use in the texts to achieve the functional purpose & joint negotiation, independent construction and linkage to related texts (Hyland, 2003,2007). (attribution) (M1)	more information on methods used in genre pedagogy
Cheng (2008) examined the effects of teaching 26 Taiwan college freshmen the functional approach to writing in an EFL composition course. (attribution) (M1)	information on research findings
Cheng (2008) found that students improved in rhetorical moves in content development, textual coherence and language use, as seen from pre to post tests. (attribution) (M1)	information on research findings
Chandrasegaran and Yeo (2006) found that after teaching some elements of the genre approach to writing to 33 Secondary 3 students in Singapore, the students' awareness of rhetorical goal in writing narrative texts, the quantity of epithets and ideational tokens increased in their post-instruction essays. (attribution) (M1)	information on research findings

Pang (2002) compared the effects of two different genre-based approaches to the teaching of writing, a textual-based and a contextual-awareness approach, on L2 Hong Kong undergraduates' writing. (attribution) (M1)	information on research findings
Pang (2002) found that the textual-analysis approach yielded better results on mechanic elements of the genre whilst the contextual-analysis approach yielded better results on rhetorical elements. (attribution) (M1)	information on research findings
Research question What are the effects of planning conditions [...] and subplanning conditions […] on text quality, fluency, lexical complexity and Flesch reading ease…?	claim of significance: the need to study the effects of planning and subplanning conditions in the writing process

The next citation function to be reported is evaluation. One of the main rhetorical purposes of the evaluation citation in the introduction subgenre is to legitimise various aspects of the writer's proposed study such as the methodology, research paradigm or research area by exposing a deficit space within a relevant research territory. This deficit in the research territory is typically identified through citations that support the writer's negative evaluation of existing research.[15] The findings show that EX and NE texts differed in their rhetorical effectiveness of this aspect of citation use, mainly in terms of how what was evaluated contributed to creating the research gap or limitation required to legitimise the writer's claim for the need of their study (claim of significance) or for the selection of an approach/paradigm in their study.

The evaluative use of citations in Excerpt 6.3, taken from EX2B, is rhetorically effective. The writer provides three evaluative reasons supported by citations to justify the need for their proposed study. Each of the reasons is in the form of an evaluative comment on existing research. The reasons include a lack of research in science (*most concerned… humanities and social sciences*), a lack of research in non-Anglophone settings (*general lack of parallel… Asian universities*) and the lack of research in writing for publications (*consist of writing for publication… rather than fulfilling coursework*).

The evaluative comments with the citations that support them are purposeful and relevant to exposing the shortcomings of existing research and to creating the gap required to justify the

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[15] In this study I have included the writer's decision to align with a scholar's evaluation of literature as the evaluative use of citations as well.

writer's study on writing for science publications among Asian doctoral students (*to understand various aspects of writing for publication among science doctoral students in China*).

Excerpt 6.3: EX2B's effective use of evaluative citations to legitimise the writer's proposed study

Excerpt 6.3	Annotation how evaluative citations contribute to legitimising the writer's proposed research
6.1 Literature background	
In the past two decades there has been no dearth of research on writing in academic disciplines. (M1)	
Riazi (1997) for example, summarized 20 studies related to writing and academic disciplines during 1984-1994. (exemplification) (M1)	
The decade-odd time following that period has seen a continuation of interest in the topic among researchers in academic literacy. (M1)	
In particular, there has been a growing interest in the writing at the graduate school level (e.g., Belcher & Braine, 1995; Berkenkotter et al., 1988, 1991; Casanave, 2002; Hyland, 2004; Prior, 1998; Ventola & Mauranen, 1996), involving both NES and NNES students. (attribution) (M1)	
However, in spite of the large number of studies, underexplored areas remain. (M2)	
Firstly, <u>most</u> of the studies were <u>concerned</u> with students in the <u>humanities and social sciences,</u> although there have been a few exceptions of published studies that featured NNES science research students (Blakeslee, 1997; Dong, 1996; Gosden, 1996; P. Shaw, 1991). (evaluation) (establishing links between sources) (M2)	citations used to support evaluative comment on lack of existing studies on writing for publication comment on lack of research in science
Secondly, whether working with NES or NNES students, <u>most studies</u> were conducted in North American universities; there is still a <u>general lack of parallel</u> research with NNES students in non-Anglophone settings, such as <u>Asian universities</u> (Braine, 2002). (evaluation) (M2)	comment on lack of research in non-Anglophone settings these citations contribute to exposing the gap in the existing research territory which is required to legitimise the writer's study on the need to study

	writing for publication among science doctoral students in China (research objective)
Thirdly, the studies tended to be "housed" in the context of a disciplinary curriculum, i.e., examining how individual students represent and fulfil coursework writing tasks. (M2)	
For science research students, however, the essential writing task tends to <u>consist of writing for publication</u> in specialist journals <u>rather than fulfilling coursework</u> (Gosden, 1995, 1996; Leki & Carson, 1997). (evaluation)	citations used to support evaluative comment on lack of research in writing for publications for science research students this citation further strengthens the need to study writing for publications among science students
Research objective (no RQ provided) To understand various aspects of writing for publication among science doctoral students in China (paraphrased from EX2B's thesis introduction)	claim of significance: to justify the need to study writing for publication of science doctoral students in China

In contrast to EX2B's use of evaluative citations in Excerpt 6.3, NE2D, in Excerpt 6.4, uses evaluative citations less effectively. The writer in this excerpt uses citations evaluatively to expose limitations of existing methods of studying advertising and to introduce the strengths of the discourse approach. Specifically, the writer uses the critique of an authoritative source (*Cook, 1992*) as a basis for exposing the limitations (*separating out components… and ignoring others; little or nothing to say… without paying any attention...*) of these approaches and strengths (*more complete... more difficult… trying to describe all these elements…*) of the discourse approach. The critique of existing methods of studying advertising in favour of using a discourse approach, however, does not align with what the writer actually plans to do in their own study (*make use of Cook's [1992] framework to analyse advertising language*). Cook's approach, to studying all elements of advertising, does not justify the writer's selection of this approach, as they aim only to study the language of advertising.

Excerpt 6.4: NE2D's less effective evaluative use of citations to legitimise the writer's approach for their study

Excerpt 6.4	**Annotation** evaluative comments do not contribute to legitimising the writer's selection of the approach for their study. writer expresses evaluation through a cited source
Language of Advertising	

Cook (1992) describes discourse of advertising as complex with 'text' and 'context' put together, interacting in a way which is perceived as meaningful and unified by the participants. (M1)	
He criticises many studies of advertising for <u>separating out components of ads, concentrating on one or a few and ignoring the others.</u> (evaluation) (M2)	citation used to evaluate other approaches to the study of advertising to expose limitations comment on ignoring components in studies of advertising
Thus, there are studies of advertising which have <u>little or nothing to say</u> about its pictures or music or the people who create it, but there are also studies, which describe the pictures of advertising <u>without paying any attention</u> to language. (evaluation) (M2)	comment on incomplete analysis of in studies of advertising
Cook (1992) further points out that describing advertising as discourse is both <u>more complete</u> and <u>more difficult</u> than any of these approaches, for it means <u>trying to describe all these elements, and their effects on each other.</u> (evaluation) (M2)	comment on strength of proposed approach
The present study will <u>make use</u> of Cook's (1992) framework to analyse advertising language. (application) (M3)	unsuccessful application of previous evaluative comments to justify the writer's selected approach for the study of various aspects of advertising the previous evaluative comments on the completeness of the discourse approach to study all elements of advertising do not justify the use of the approach by the writer who aims only to study the language of advertising
Research aim The study of various aspects of advertising	claim of significance: to legitimise the need to study various aspects of advertising

The final citation function to be reported in this section is application. Application is used in the introduction subgenre to show how a cited method, definition, idea or theory applies to the writer's own research. EX and NE writers differed a lot in how effectively they were able to show the relationship between the cited work and the rhetorical goal they were trying to achieve in their study.

The application citations used by EX2B in Excerpt 6.5 were rhetorically effective. Citations are applied to support the claim that one of the issues science doctoral students in China, who

were writing for publication, needed to contend with was author-gatekeeper interaction (*scholarly texts are composed in anticipation of… reactions and criticisms… intended readership; author-gatekeeper interaction*). Three application citations are then used to show how ideas in the cited sources apply to support this claim. The first application citation introduces the tension that writers need to navigate. This tension has to do with the need to claim the originality of their work while maintaining the relationship of the work to the larger body of knowledge in the community (*researcher tries to show that he or she deserves credit for something new… while… reviewers try to relate the claim to the body of knowledge*). The second application citation introduces tension resulting from ideological conflict (*tension… could result from the different ideological orientations of the two*). The third application citation introduces tension in the writer's response (*accommodationist… or… resistance*) to the gatekeepers' own allegiances and presumptions in the judgements they make during the revision process. The application citations are rhetorically effective because they are relevant to building the research landscape needed for the writer's research on the investigation of various issues faced by science doctoral students writing for publication in China.

Excerpt 6.5: EX2B's effective use of application citations to build a research territory

Excerpt 6.5	Annotation how application citations are used to build the research territory for the writer's research question
7.1 Literature and theoretical background	
From a social constructionist perspective, <u>scholarly texts are composed in anticipation</u> of or in light of the reactions and criticisms from the intended readership, often the gatekeepers (the editors and referees) of a target journal above all (Berkenkotter & Huckin, 1995; J. Flowerdew, 2000a; G. Myers, 1985). (attribution) (M1)	
Such a social constructionist view not only points to the social dimension of research writing, but its political dimension as well, for the <u>author-gatekeeper interaction</u> is hinged upon a power inequity between the two. (M1)	tension experienced by doctoral students
G. Myers (1985, p. 595) attributed a tension inherent in the power inequity to the conflict over novelty claim, the crux of all research writing: "On the one hand, the <u>researcher tries to show that he or she deserves credit for</u> <u>something new</u>, while, on the other, the editors and <u>reviewers try to relate the claim</u>	citations are applied to show how ideas in source texts apply to supporting the claim about tensions between students and gatekeepers introduced earlier

to the body of knowledge produced by the community." (application) (M1)	tension between the researcher deserving credit and reviewer relating the writer's work to the common body of knowledge
Yet apart from the tension resulting from arguments over novelty claim, the author-gatekeeper tension could also result from the different ideological orientations of the two, as indicated in J. Flowerdew's (2000a) study of a Hong Kong scholar's publication process and B. Morgan's (1997) report of his own publication experience. (application) (M1)	tension between ideological orientations between researchers and gatekeepers
Since gatekeepers have to make judgements on the basis of their own research background and expertise, they could also impose their allegiances and presumptions in the revision process. (M1)	
Authors' attitude to this could be more or less strongly accommodationist in their desire to get published (Berkenkotter & Huckin, 1995; J. Flowerdew, 2000a); or, where the gatekeepers' criticisms point to the rejection of a manuscript, the negotiation between gatekeepers and authors could take the form of resistance on the part of the latter (Gosden, 2001; G. Myers, 1985). (application) (M1)	tension between responding in an accommodationist or in resisting manner to the gatekeeper's own research allegiances and presumptions

each of the application citations used contributes to building the landscape of one of the issues investigated in the writer's study on writing for publication among doctoral students in science in China |
| **Research objective (no RQ provided)**

To understand various issues Chinese doctoral students in science face in writing for publication. (paraphrased from EX2Bs thesis introduction) | Claim of significance: to justify the need to study various issues faced by Chinese doctoral students in science writing for publication |

In contrast to Excerpt 6.5, Excerpt 6.6 from NE1C displays a less rhetorically effective use of application citation. This excerpt implies the value of studying voice (*allow researchers "inside students' learning" experience*) to fulfil the writer's research goal of studying the experience of novice writers of research papers (to study novice writers' experience of research papers).

The citations applied to support the approach of using voice to study student learning experience, however, do not directly relate to the research goal of the writer's study. This is because the relationship between the approach and the research goal of the study is not stated

explicitly. First, the relationship between the benefits of studying voice as a means of gaining insight into students' learning how to write research papers (*allow researchers "inside students' learning" experience*) and the analysis of the writer's experience, as well as texts (*analysing both the writer's experience as well as the text produced by writers*), is not made directly. Next, the relationship between the study of voice, analysis of texts and the potential benefits of the approach to help student writers (*teach students to explore and define their own problems*) is also not made directly. The use of application citations hence does not explicitly show how the study of voice will achieve the writer's research goal to provide information on the writing experience of students writing research papers (*how do novice writers describe their experience as research writers?*). Application citations in this NE excerpt are not used effectively to achieve the writer's intention of introducing the approach they will adopt to answer their research question.

Excerpt 6.6: NE1C's less effective use of application citations to show how a proposed approach can achieve their research goal

Excerpt 6.6	Annotation application citations not used effectively to introduce approach to be used to answer the writer's research question on novice writers' experience as research writers
Learning to write research papers -	
To study the writing experience, the student's voice can be taken into consideration and the students' roles of being novice writers and researchers in the university will <u>allow researchers "inside students' learning"</u> (Sommers & Saltz, 2004, p. 146) <u>experience</u>. (application) (M3)	citation applied to imply that studying voice provides a means to study novices' learning experience of writing
Bartholomae (2011) reflects on his earlier work and comments that he looks forward to research 'with the student writing in the centre' (p. 280) (M3)	
This involves <u>analysing both the writer's experience as well as the text produced by writers</u>. (application) (M3)	citation from research on student writing in the centre is applied to imply an analysis to study writing experience involves both experience and texts produced by writers

the writer does not show a direct relationship between the study of voice and the analysis of texts and experiences of writing at the centre |
| The present study has the potential to enable writing instructors (such as myself) to "<u>teach students to explore and define their own problems,</u> even within the constraints of an | citation implies an application that suggests the study of voice can benefit students with writing problems |

assignment, (in order to) …help them to create inspiration instead of wait for it" (Flower & Hayes, 1980, p. 32). (application) (M3)	the writer does not make explicit how the study of voice can achieve the potential outcome of helping students with their writing problems
It may also help instructors to address the difficulties students face when writing their papers. (M3)	
1.4 Research question How do novice writers describe their experience as research writers?	Research aim: to study novice writers' experience of research papers

Table 6.3 summarises the findings on the main rhetorical differences in the use of attributive, evaluative and application citations.

Table 6.3

Differences in the Selection and Use of Citations in EX and NE Texts

Citation Type	EX Texts	NE Texts
Attribution	Effective selection and use because information from sources was used purposefully to display knowledge and to build a relevant research territory for the study proposed in the introduction	Ineffective selection and use because information from sources was used to display knowledge that did not relate to the study proposed in the introduction
Evaluation	Effective selection and use because evaluative citations were used effectively to legitimise the writer's proposed study	Ineffective selection and use because evaluative citations were used to legitimise the writer's study but what was legitimised was not in alignment with how the writer planned to approach their study
Application	Effective selection and use because sources from the literature were used applied effectively to build a research territory for an issue related to the writer's proposed research	Ineffective selection and use because the relationship between the sources selected to show how the writer intended to approach their research problem and the research problem was not explicitly made to show how the citations applied to the writer's study

6.2 Discussion: Critical Thinking in Citation Decisions

This section continues the discussion covered in Section 5.2 on how underlying CT could account for the differences in findings on the rhetorical quality of citation choices that appear in the written texts presented in the preceding section.

As was the case in Section 5.2, the labels for the CT processes, are derived from the taxonomy of CT processes found in Appendix 2. The construct of CT developed in Chapters 2 and 3 using social-cognitive theory of problem solving (Flower, 1987, 1994) and genre theory (Bhatia, 1993; Swales, 1990) will, as in the earlier discussion section, be used here to interpret how CT could account for the differences in rhetorical success of citations selected and used to achieve the rhetorical goals required to construct the argument of the claim of significance expected in the introduction subgenre. Genre knowledge required for the CT process of interpreting the sociocultural context, to represent the problem task for the selection and use of citations, includes knowledge of the role citations play in argument construction (Hyland, 2004a) and the possible functions they could be used for (Petric, 2007; Thompson, 2002). In addition, social knowledge required for argument construction includes knowledge related to the macro- (arguing for the claim of significance or need for the writer's proposed study) and the local rhetorical-argument goals (constructing the research territory, legitimising the purpose or approach used for the study, drawing links between existing knowledge and the writer's own study) which citations are used to achieve.

Examples of citations in EX and NE texts reported in the findings Section 6.1 will be used to show the possible CT processes that are likely to have played a role in effective or less effective decisions in the selection and use of citations during text construction. The discussion in this section is divided into three subsections relating to the three citation functions (attribution, evaluation and application) presented in the findings section.

6.2.1 CT indicated in attribution citations (genre-oriented, goal-directed thinking).

The selection and use of attributive citations in the EX sample suggests that several CT processes were in operation. One such CT process would have been interpreting (Beyer, 1995; Facione et al., 1990; Raths et al., 1986) social goals for the use of citations in the introduction subgenre, which work in concert with the CT process of differentiating information (Beyer, 1995; Sternberg, 1986) relevant for using citations in the introduction subgenre. Two such goals that are relevant for the use of attributive citations are the social expectation to situate the writer's study using community-generated citations (Hyland, 2004a) and the need for the writer to display good knowledge of the literature associated with the research topic of their study (Petric, 2007; Thompson, 2002). In addition to interpreting social goals to construct the problem task for the selection and use of citations, the CT process of creating rhetorical-argument goals to determine the use of citations selected would be required to create local and macro goals from the social goals (Flower, 1989; Flower & Hayes, 1981). The CT process of

goal-directed thinking (Flower & Hayes, 1981) would then enable the writer to use rhetorical goals to guide the selection and use of citations for the text. The following comments of the writer of EX1B displays goal-directed thinking in the selection and use of source materials in their text. Their interpretation of the reader's needs shaped and directed their goal to provide background information to inform their reader about the key concepts (e.g., definitions) of their topic (bilingualism) and the theorists (sociolinguists) who influenced their work.

> Interviewee of text EX1B: I guess I wanted to make sure the reader knows the background context and the particular aspect of bilingualism and sociolinguistics that I am looking at. And I just assume the definition would be part of that.

The following comments reported by the writer of EX1A displays a conscious engagement in goal-directed thinking in the selection and use of citations.

> Interviewee of text EX1A: The rhetorical goal of the chapter, and the subgoals that assist its realisation, form the basis of my decisions relating to source use. I use literature to support my legitimisation of the research problem in this chapter: to show that my research questions reflect an authentic problem that deserves inquiry. To do this, I have a list of subgoals that I use to guide source use in different phases of the chapter.

Critical to applying goals to direct the use of citations in a text is the related CT process of recognising and constructing links (Beyer, 1995; Sternberg, 1986) between the function of source information and the local/macro-rhetorical-argument goal of the introduction subgenre. This process would enable the writer to ensure the sources selected to fulfil the purpose of the citation are vetted through goal-directed thinking that ensures the citations and their purposes are relevant to achieving the local and macro-argument goals of the text (e.g., by ensuring the source information selected is relevant to the writer's research topic).

The selection of attributive citations by EX1B in Excerpt 6.1 suggests that CT is involved in the selection and use of citations by ensuring the information on bilingualism presented in the first two attributive citations (e.g., the bilingual process, how it occurs in a community) is relevant to achieving the local goal of building the research territory for the study on language shift. Genre-oriented rhetorical goals would have directed the selection and used of citations. These CT processes can be inferred in the excerpt, as the local rhetorical goal of building a research territory for language shift constructed from the research question (*what are the factors most associated with Hakka [language] shift?*) would have provided the filter for determining the relevance of the citations to select, and the social goal of using citations to

display a good knowledge of the literature to build a relevant research territory would have determined this local rhetorical goal. In addition, the selection of relevant citations to construct the local goal that fulfilled the macro-goal would have required the CT process of seeing and making connections between the attributive citations selected and used and the macro-rhetorical goal of the text determined from the research question (*what are the factors most associated with Hakka [language] shift?*).

Another set of connections requiring the CT process of seeing and making connections would likely have involved seeing and making connections between citations on bilingualism and language shift. The outcome of this connection can be observed in the explanation in the excerpt that linked bilingual social contexts to language shift (*minority and majority languages… same social contexts... likely to lead to language shift*). This connection is critical for showing the relevance of the attributive citations on bilingualism to the writer's study on language shift. It shows that the writer of this excerpt was not using attributive citations to merely reproduce or retell "what other authors stated" (Bereiter & Scardamalia, 1987; Petric, 2007). It shows that CT was involved in ensuring the knowledge presented in the attributive citations was done purposefully to provide background knowledge for studying language shift in bilingual communities. As such the writer not only fulfils the expectation to display good knowledge of the literature (Ridley, 2000; Swales, 1987) but does so in a manner that does not merely reproduce knowledge but uses knowledge to achieve a rhetorical purpose (building the research territory) for their study.

In contrast to EX1B, the writer of NE2C in Excerpt 6.2 displayed a less analytical form of attribution that is termed knowledge telling or reproducing information from source texts without much change (Bereiter & Scardamalia, 1987; Petric, 2007). In their use of attribution, there does not seem to be a clear purpose for the knowledge of the literature (e.g., who advocated the genre approach, its promised benefits, methods employed in genre pedagogy and research findings associated with it) presented in citations apart from fulfilling the social goal of displaying a good awareness of the knowledge in the literature. Though one of the rhetorical goals of attributive citations was fulfilled through genre-aware goal-directed thinking to display good awareness of the literature, the other rhetorical goal to select knowledge relevant to the writer's proposed research, to achieve its rhetorical goal, was not. This makes the selection and use of these citations in this excerpt rhetorically ineffective because the knowledge selected to fulfil the rhetorical goal of building the research territory does not build the territory for the writer's research on planning and subplanning conditions in the writing process.

One apparent reason for the lack of rhetorical success of these attributive citations can be attributed to the inactivity of the CT process to see and make connections between the information (e.g., genre approach) introduced in the citations selected, and used, and the nature of the research reflected in the research question on the effects of planning and subplanning conditions in the writing process. As such the information presented by the writer in the attributive citations seems to be knowledge that is stacked one after another without having any bearing on the macro-rhetorical goal of the text (to argue for the need to study planning and subplanning conditions in the writing process). The information hence does not build a research territory for the claim of significance.

The problem of stacking up information without a rhetorical purpose is common in less effective writing and described as a less analytical or complex use of citations (Petric, 2007). It is also described by Flower and Hayes (1981) as a topic rather than a rhetorically centred approach to text construction. The inability of the writer to engage in CT that saw and made connections in this excerpt seems to have had a snowball effect on the rhetorical success of the text. It appears to have led to a lack of bearing between the knowledge selected and used in citations and the rhetorical goals of the text.

6.2.2. CT indicated in evaluation citations.

The use of citations evaluatively is considered to be more complex than its attributive use (Bereiter & Scardamalia, 1987; Petric, 2007). This suggests there are CT processes that operate in addition to the processes discussed in the previous section on the selection and use of attributive citations. The common CT processes operating in the selection and use of evaluative citations include the CT process of interpreting social goals and creating rhetorical goals for them. These processes then facilitate the goal-directed thinking required for the selection and evaluative use of citations to achieve rhetorical goals such as to legitimise the purpose for the study in question or the methodology selected for use in the study. Specific to the evaluative use of citations to achieve the goal of legitimisation is the related CT process of evaluation (Beyer, 1995; Bailin et al., 1999b; Facione et al., 1990; Gubbins, 1985) where citations are used evaluatively to expose limitations in the existing body of knowledge.

In addition to the generally occurring CT processes in the selection and use of citations, other processes associated with transforming information from source texts into the constructed new text, also known as the process of knowledge transformation (Flower et al., 1990; Scardamalia & Bereiter, 1987; Spivey, 1990), are in operation in the more complex use of citations such as

using them evaluatively. The CT processes associated with knowledge transformation include the CT process of reconfiguring (Sternberg, 1986) and the process of interweaving (Bailin et al., 1999b; Beyer, 1995) citations to fit the developing text by making new connections between citations and between citations and the text (Spivey, 1990). The resulting use of citations extends beyond using them to inform "what others said" (knowledge telling) to more complex and novel uses in the new text. The writer of EX1A reported that they engaged in this process of transformation when they were solving the problem of how to fit the information for the selected source texts into the developing texts they were constructing. The writer's comments below show an awareness of the need to tailor source information to fit the developing argument of the text.

> Interviewee (text EX1A): Sometimes, there may not be a detail that address significance directly, the way I want it – e.g., Andrews and Wingate, who each writes about gaps in writing instruction in doctoral and undergraduate education respectively. Then, I tailor those details to fit my rhetorical needs (to establish significance of academic criticism as a topic of inquiry). So I write that studies on academic criticism, such as mine, will be important to fill those gaps that Andrews and Wingate have described. In summary, during writing, content selection is guided by local rhetorical goals in the developing text

Similarly, the writer of EX1B also reported engaging in transforming citations for use in their text. The comments below report on how the writer attempts to transform citations by asking questions about their purpose to contextualise their citations for their own study.

> Interviewee (text EX1B): So, say, the first sentence, this citation, what is this citation doing, and then I try to contextualise it, given the background literature.

It can be inferred from Excerpt 6.3 written by EX2B that several CT processes were in operation, contributing to the rhetorical success of the evaluative use of citations in the text. The CT process of seeing and constructing links between the source information and the rhetorical goal of the text can be said to contribute to the effective goal-directed selection and negative evaluation of information (e.g., lack of research in science, lack of research in non-Anglophone settings, lack of research in writing for publication among doctoral students) required to achieve the macro-goal of justifying the need for the writer's study on writing for publication among doctoral students in science in China (*to understand various issues Chinese doctoral students in science face in writing for publication*). The CT process of constructing links between source information and the rhetorical goal of the text would also have contributed

to effective goal construction required for guiding the relevant selection and evaluative use of citations (to provide negative evaluation) that exposed the need that will justify the proposed research, specifically articulated in the research question of this text, and fulfilled the goal of using citations to differentiate the writer's research from existing studies (Petric, 2007).

Other CT processes likely to be in operation are transformative processes such as comparing citations (Raths et al., 1986), identifying relations between and among them (Gubbins, 1985) and grouping or classifying them (Bailin et al., 1999b; Raths et al., 1986) according to the category of deficiencies (e.g., citations associated with science research, with research in Asian universities, with research in writing for publication among doctoral students) identified to provide evidence for the need for the writer's proposed research. The writer of EX1A reported that the process of sorting citations was involved in using citations to achieve their rhetorical-argument goal, to create the territory of their research, and their citation or intertextual goal to use citations to show their readers they have good knowledge and understanding of their field.

> Interviewee of EX1A: For example, when it is timely for me to provide a broad overview of the field of academic criticism, I may sort similar studies together to show the different strands (e.g., in higher education, in the disciplines, across cultures) within the field [see Section 1.2.5]. The decision to sort studies by strand is my way of constructing authorial credibility. I wanted reviewers and examiners to think "this is one writer who has researched his field thoroughly, and is well placed to make critical comments about gaps in existing research."

The inactive or suppressed use of some CT processes in Excerpt 6.4 can be said to contribute to the rhetorical ineffectiveness of evaluative citations used by NE2D. The writer of this excerpt seems to have engaged in the CT process of recognising the need for the selection and use of source information to be guided by the rhetorical goal to study advertising as stated in the study's research aim (*the study of various aspects of advertising*). This can be inferred in the selection of source information to function evaluatively to justify the writer's selection of the approach (discourse approach) to study advertising. In choosing to align their self with an authoritative source's (*Cook, 1992*) evaluation of existing approaches to the study of advertising, the writer presented an evaluative comparison between existing approaches (e.g., *little or nothing to say*) and the preferred discourse approach (e.g., *complete*), providing a justification for their choice of approach. Although the writer seems to have engaged in complex CT processes of comparison between the discourse approach and other approaches to the study of advertising, they appear to have underengaged in the CT process of recognising

and constructing the relationship (Beyer, 1995; Sternberg, 1986) between the approach they have chosen to defend and how they intend to use the approach. This is because while they have critiqued approaches that do not critique *pictures or music or the people who create it* and those that critique *pictures without paying any attention to language,* the approach they select to analyse the language of advertising only analyses *advertising language*.

6.2.3 CT indicated in application citations.

Application is another example of the complex use of citations. It is used to make connections between the source information and the writer's study by using "arguments, concepts and terminology or procedures from the cited work for the writer's own purposes" (Petric, 2007, p. 244). The CT processes involved in the use of application citations would generally be similar to those used in evaluative citations. The main difference would likely be in how the citation is transformed for use in the text. While evaluative citations involve the CT process of evaluating source materials to create a justification for an approach or idea proposed in a study, application citations involve the CT process of drawing links between information from sources and the arguments made in the texts by using citations to provide support for a claim or by showing how ideas, approaches, and paradigms from source information are used in the new context of the writer's study (Beyer, 1995).

In Excerpt 6.5, the CT process of goal direction is evident in the relevance of the information displayed in application citations about tensions experienced by doctoral students and the rhetorical goal of creating a research territory for the study of issues faced by doctoral students in China, as reflected in the excerpt's research objective (*to understand various issues Chinese doctoral students in science face in writing for publication*). The CT process of seeing and making connections is evident in the relevance of information presented in the three sets of application citations that are used to support the claim that scholarly texts are composed in light of the criticisms and reactions of gatekeepers in an unequal power relationship with doctoral-student writers. Other CT processes likely to be in operation include seeing relations such as similarities and differences between citations evidenced in the thematically sorted categories of causes of tension (new versus common knowledge, ideological orientation, response to gatekeeper's judgements) in the author-gatekeeper interaction.

In contrast to Excerpt 6.5, Excerpt 6.6, written by NE1C, seems to underengage in the CT process of seeing and making connections between citations. On the one hand, the CT process of goal-directed thinking seems to be in operation in the selection of application citations (e.g.,

the study of voice, analysing writer's experience and text) that are relevant to the rhetorical goal of introducing a suitable approach to the study of the writing experiences of research writers. On the other hand, the CT process of seeing and connecting relations between the application citations seems absent as the connection between the application citation on voice, the application citation on analysing experiences and text, and the application citation on the usefulness of the approach of the study of voice to teaching students to address their problems, does not exist. The three instances of the selection and use of application citations do not relate to one another.

6.3 Summary

This chapter has reported on findings related to the selection and use of citations in the introduction subgenre of EX and NE texts. It was found that EX texts generally used a higher density of all citation functions than NE texts except for the use of less complex attributive citations, suggesting that EX texts engaged in more complex CT operations. Additionally, though there were instances where individual EX texts used less complex citations than NE texts, EX texts tended to display a more rhetorically effective use of citations.

The discussion on how CT could contribute to the rhetorical differences in citations used strongly suggests that CT processes contribute to the rhetorical effectiveness of citations selected and used. Specifically, it was observed that the lack of engagement in the CT process of seeing and making connections impacted other related processes that acted in concert with it. This resulted in problems such as a lack of relevance between the cited source and the research territory to be built, a lack of alignment between approaches legitimised through evaluative citations and how the writer planned to conduct their own study, a lack of connection between citations selected for application in the writer's proposed research, and a lack of connection between various sets of citations.

The list of some of the CT processes inferred to have collaboratively contributed to the selection and use of citations include:
- Interpreting social goals by anticipating reader expectations
- Differentiating information relevant for using citations in the introduction subgenre
- Creating genre-aware rhetorical goals
- Goal-directed thinking in the selection and use of citations
- Recognising and constructing links (e.g., between citations selected and the writer's research, between citations)

- Comparing

- Grouping or classifying

- Reconfiguring citations to fit the new text (e.g., making new connections between citations)

- Interweaving (synthesis) source information to fit the new text (e.g., between citations and new text)

- Evaluating source to expose limitations in existing literature (specific to evaluative citations)

- Drawing links between source and arguments in new text (application; e.g., using source to support an argument, using source ideas in a new way in a new context)

Chapter 7

Findings and discussion on stance taking

This chapter continues from Chapter 5 and Chapter 6 to report[16] on genre features analysed in EX and NE texts. It reports on how EX and NE texts differed in the density and use of stance-taking (ST) devices and how CT could have accounted for the differences in the rhetorical quality of texts that resulted, on the basis of the theoretical construct of CT developed in Chapters 2 and 3. Rhetorical effectiveness was determined in terms of the considerations made in arriving at stance-taking choice decisions that achieve the rhetorical purpose of the stance device in the text during text construction (as described in section 4.3.2).The discussion on how underlying CT could account for surface differences in the rhetorical quality of stance devices observed in the text, was based on the implicit link between CT and writing, and interpreted using the construct on the nature and role of CT developed in Chapter 2 and 3. The interpretation involved extrapolating the underlying thinking processes/behaviours (discussed in section 2.5) related to how decisions on stance-taking devices were made during problem solving and evaluation of stance-taking choices in the construction of texts.

The chapter is divided into two main parts. Section 7.1 reports on the findings on stance use and Section 7.2 discusses the findings. Section 7.1.1 reports on what the quantitative data shows about the difference in the density, range and rank order of ST devices used in the EX and NE texts as compared to the conventional distribution of the devices reflected in expert-written texts.

Section 7.2 provides an overview of CT processes that could be inferred from the selection and use of ST devices and 7.2.1 highlights the CT processes that can account for the differences observed in the selection and use of epistemic stance, attitude and personal intrusion in EX and NE texts. Interview data is used to complement the discussion of CT processes inferred in the enactment of ST devices where the data was available.

7.1 Findings: Stance-Taking Choices in EX and NE Texts

This section reports on ST devices used in EX and NE texts analysed in this study. These choices can reveal something about how critical thinking can be responsible for successful

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[16] Segments of excerpts reported in the findings and discussion sections are italicised.

writing because the decision to select and use ST devices such as whether to hedge or not hedge a claim, for instance, is not made arbitrarily.

The findings report on the trends and patterns of ST devices used in the EX and NE texts where the occurrence of the devices, reflected as observable outcomes (as I have argued in Chapter 3), is considered to be the result of intentional choices writers make during text construction. The patterns and trends in the two groups of texts are compared with those found in expert texts in applied linguistics studied by Hyland (2005b, 2008).[17] The purpose of this is to examine how the patterns of use in ST devices in successful and less successful texts compare with what the discipline considers to be valued patterns of persuasion (as modelled by experts). These patterns are the outcomes of ST decisions shaped by the social expectations of the discipline, which novice writers are expected to acquire in order for them to make ST decisions that persuade their readers in a manner a reader in the discipline would find acceptable (Hyland, 2005b, 2008).

This section comprises Section 7.1.1, which reports on the patterns of ST devices used to persuade the reader to accept the writer's claim for the need of their study (claim of significance) as valid and reasonable, by positioning their self (the writer) in the text. The following Section 7.2 then discusses how CT can account for the choices reflected in the patterns observed in the two groups of texts.

The findings that follow in the next section focus on providing an overview of observable trends and patterns of ST choices in EX and NE texts as well as highlighting individual patterns aimed at providing more in-depth information (individual variation) about how ST devices are used in the texts within each sample.

7.1.1 Choices of ST strategies for persuading the reader.

Table 7.1 shows that the occurrence of ST devices is higher in EX than in NE texts. EX writers chose 3.3 times more ST devices per 1000 words than NE writers, whose texts were twice as long. Both groups, however, used fewer ST devices than expert writers reported in Hyland (2005b, 2008). Expert writers used 2.7 times more ST devices than EX writers and 5.27 times more ST devices than NE writers.

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[17] Hyland's study shows that the ST patterns show a high level of consistency across disciplines and that variations across disciplines can be accounted for through differences in social expectations related to persuasive practices in the discipline.

Table 7.1

Density* of Stance-Taking Resource in Expert, EX and NE Texts

Resource	Expert (AL)[18]	EX	NE
Occurrence	Density*	Density	Density
Stance	37.2	13.65	7.05

*Occurrences per 1000 words

The next Table 7.2 shows how the distribution of individual ST devices in EX and NE texts compares with the distribution of similar devices in expert texts. Of interest is the observation of how the devices are distributed in terms of the three strategies used to persuade the reader to accept the claim for the need of the writer's study (i.e., claim of significance) argued for in the introduction subgenre. As mentioned in the earlier findings chapters, arguing for the significance of the writer's study is also the rhetorical macro-rhetorical goal of the introduction subgenre.

The three strategies used to persuade the reader can be categorised into persuasion through hedging and boosting using epistemic ST devices (i.e., appealing to the reader's logic); through attitude devices that persuade through evoking assumptions of shared beliefs or common ground (i.e., appealing to the reader's emotions); and through the writer's direct intrusion into the text (i.e., appealing through the use of the writer's explicit voice).

The three strategies include using hedges and boosters to persuade through epistemic-stance taking, using attitude markers to persuade through establishing common ground and using self-mention to persuade through the writer's direct intrusion into a text to distinguish the writer's perspective and work from others.

Table 7.2

Distribution of Stance Features in Text Groups by Rank Order (Per 1000 Words)

Expert (AL) Texts		Exemplary Student Texts		Non-Exemplary Student Texts	
Rank	**Density***	**Rank**	**Density**	**Rank**	**Density**
1. Hedges	18.0	1. Attitude	5.1	1. Attitude	2.5
2. Attitude	8.6	2. Hedges	4.5	2. Self-mention	2.4
3. Boosters	6.2	3. Self-mention	3.4	3. Hedges	1.6
4. Self-mention	4.4	4. Boosters	0.6	4. Boosters	0.6
Total	**37.2**		**13.6**		**7.1**

[18] Data on expert writing in applied linguistics (AL) is extracted from Hyland (2005, 2008).

Epistemic stance (hedges and boosters) was the most frequent persuasive strategy occurring in expert texts. Hedges ranked the highest with a density of 18.0, while boosters ranked third with a density of 6.2. Persuading through building solidarity or by appealing to shared assumptions with the reader through attitude markers ranked second with a density of 8.6, while persuading through the writer's direct intrusion into the text ranked the lowest with a density of 4.4.

At a glance, it can be observed in Table 7.2 that for EX writers the distribution of the occurrence of ST devices aligns more closely with that of expert-written texts than do NE texts. The order of strategies displayed in expert-written texts is hedges, attitude, boosters and self-mention. The order of persuasive strategies in EX texts is attitude, hedges, self-mention and boosters, while the rank order of strategies in NE texts is attitude, self-mention, hedges and boosters. ST devices, specifically hedges and attitude, occupy the top two ranks, while boosters and self-mention occupy the bottom two in expert and EX texts.

NE texts showed a markedly lower density of use of all devices than EX texts. EX writers choose 2.8 times more hedges, 2.0 times more attitude and 1.4 times more self-mention than NE writers. The findings also show that NE writers use more self-mention that hedges and boosters, deviating from the conventional practice of ST being the most frequently used device (Hyland, 2005b, 2008). Self-mention ranks second in NE texts, while it ranks last in expert-written texts though it plays an important role in the soft discipline such as AL (Hyland, 2005b, 2008).

For the occurrence of epistemic stance, the density of hedges is higher than the density of boosters in EX, NE and expert-written texts. Hedges occur 7.5 times more than boosters in EX texts, 4 times more in NE texts and 2.9 times more in expert-written texts.

Turning to individual texts within the EX group, Table 7.3 shows that all individual EX texts, with EX2A displaying a small variation, reflect the group distribution of ST devices discussed. Hedges or attitude occupy the top two ranks, while self-mention or boosters occupy the bottom two.

Table 7.3

Rank Order of Stance-Taking Resources in Individual Texts of EX Group

Rank	EX1A	EX2A	EX1B	EX2B
1	Attitude	Hedges	Attitude	Attitude
2	Hedges	Attitude/ Self-mention	Hedges	Hedges
3	Self-mention		Boosters	Self-mention
4	Boosters	Boosters	Self-mention	Boosters

In the NE group, Table 7.4 shows that two texts (NE2C and NE2D) display a similar distribution to EX texts with attitude or hedges occupying the top two ranks and boosters and self-mention the bottom two. Self-mention in NE1C and NE1D, however, ranks in the top two positions as the main persuasive strategy.

Table 7.4

Rank Order of Stance-Taking Resources in Individual Texts of NE Group

Rank	NE1C	NE2C	NE1D	NE2D
1	Self-mention	Attitude	Attitude	Hedges
2	Hedges	Hedges	Self-mention	Attitude
3	Attitude	Boosters	Boosters	Self-mention
4	Boosters	Self-mention	Hedges	Boosters

A closer look at the densities of NE1C and NE1D in Table 7.5 shows that NE1C has an exceptionally high density (6.5) of self-mention and NE1D has an exceptionally high density (8.2) of attitude. The density of self-mention in NE1C is higher than the densities of self-mention in other texts in both groups, as shown in Table 7.5, as well as in expert-written texts that have a density of 4.4, as shown in Table 7.2. The density of attitude in NE1D is higher than that of the other texts in both groups shown in Table 7.5 and almost as high as the density 8.6) of attitude in expert texts shown in Table 7.2.

Table 7.5

Densities* of Stance-Taking Devices in EX and NE Texts

Stance device	Density	Density	Density	Density	Mode	Density	Density	Density	Density	Mode
	EX1A	EX2A	EX1B	EX2B	Mode	NE1C	NE2C	NE1D	NE2D	Mode
Hedges	5.9	6.5	2.1	4.4	5.1	2.9	0.6	1.0	3.1	1.9
Attitude	6.3	5.5	4.5	4.8	5.1	2.3	2.4	8.2	2.2	2.3
Boosters	0.4	1.0	1.2	0.4	0.7	0.7	0.5	1.7	0.5	0.9
Self-mention	4.9	5.5	0.9	3.2	3.9	6.5	0.2	2.4	2.0	2.2

*Occurrence per 1000 words

To summarise, the significant differences between EX and NE texts include a much higher density of ST devices in EX texts, a closer alignment in the distribution of ST devices between EX and expert-written texts and instances of exceptionally high densities of use of some ST devices in two NE texts.

Given the variation in the distribution and density of ST devices selected and used in EX and NE texts, the next section will discuss how CT could account for the differences in the persuasive quality in the two groups of texts, which result from ST choices.

7.2 Discussion: Critical Thinking in Stance-Taking Decisions

This section continues the discussion covered in Sections 5.2 and 6.2 on how underlying CT could account for the differences in the findings on the rhetorical quality of stance-taking choices that appear in the written texts presented in the preceding section

In this section, rhetorical effectiveness specifically refers to the persuasive quality of the texts achieved through the selection and use of ST devices. As many of the CT processes occurring in the selection and use of ST devices in EX and NE texts are similar to those inferred in the earlier two discussion sections, this section will first provide an overview of those CT processes as they were inferred to occur in ST decisions. Section 7.2.1 will then highlight the most prominent differences in CT processes inferred in the selection and use of epistemic stance, attitude and personal intrusion ST devices in EX and NE texts.

The same construct of CT using the sociocognitive theory of problem solving (Flower, 1987, 1994) and genre theory (Bhatia, 1993; Swales, 1990) developed in Chapters 2 and 3 was used to interpret how CT accounted for differences observed in ST decisions. Genre knowledge

relevant for interpreting the operation of CT in the selection and use of ST devices includes knowledge of the role ST devices played in maintaining writer-reader interaction in the process of advancing claims and the types of devices available for selection (Hyland, 1999, 2005b, 2008). In addition, knowledge of the argument structure of the introduction subgenre and the macro- (arguing for the claim of significance or need for the writer's proposed study) and local argument goals (e.g., constructing the research territory, exposing the research gaps for legitimising the study, defining the writer's own study) that construct the argument was required to interpret the operation of CT processes in the selection and use of ST devices that advance the claim of significance of the subgenre (Bhatia, 1993; Swales, 1990).

Further, sociocultural knowledge specifically related to the selection and use of ST devices was applied to the inferring and interpretation of CT processes. This knowledge included the expectation for claims in a discipline to be advanced through social interaction with members and texts (inter-texts) within a disciplinary community (Bazerman, 1988; Berkenkotter et al., 1991; Flower, 1993; Hyland, 2004a; Nystrand, 1989). This meant that from a social-constructivist perspective on writing, socially aware genre knowledge about ST in genre construction included knowledge that writers are expected to persuade readers to accept their claims "in a manner the reader finds convincing" (Hyland, 2004a; according to the conventions of persuasion as understood by the community).

Several CT processes were inferred to be operational in the selection and use of ST devices required to advance the macro-argument or claim of significance in the introduction subgenre, through the maintenance of the writer-reader relationship or interaction. Of these CT processes, several are similar to those required to construct other problem tasks (e.g., selecting moves, selecting citations and their function) discussed in Sections 5.2 and 6.2. The general processes inferred in Chapters 5 and 6 using labels from the taxonomy of CT processes compiled in Appendix 2, and relevant to the selection and use of ST devices, include CT processes such as interpreting (Beyer, 1995; Facione et al., 1990; Raths et al., 1986) social goals (e.g., the need to maintain writer-reader [interpersonal relations] interaction) with the aim of persuading the reader to regard the writer's claims and arguments favourably. To interpret the relevant social goals or expectations would require another CT process such as differentiating (Beyer, 1995; Sternberg, 1986) the relevant information from the sociocultural context for ST use in the introduction subgenre. In addition to interpreting and differentiating information to construct the task representation, the CT process of creating rhetorical goals (Beyer, 1985; Gubbins, 1985), which, for the selection and use of ST devices, would be the interpersonal rhetorical

goal of maintaining the writer-reader relationship, would be required to create appropriate local (e.g., advancing claims by signalling to the reader that their positions have been considered) and macro- (e.g., convincing the reader in a manner they would find acceptable) goals from the social goals (Flower, 1989; Flower & Hayes, 1981).

The interpersonal rhetorical goals for ST selection and use would then be expected to drive decision making through the CT process of goal-directed thinking (Flower & Hayes, 1981). As was the case in the selection and use of the other generic devices discussed earlier, the related CT processes of recognising and constructing links (Beyer, 1985; Sternberg, 1986) is critical to applying goals to direct the selection and use of ST devices. In the case of ST devices, these links would be between the rhetorical goal of the ST devices, which are interpersonal goals, and the local and macro-rhetorical-argument goals of the text it is used to advance. This is because the effectiveness of the ST device is dependent on it fulfilling not only the rhetorical goal of the ST device, to persuade in a manner convincing to the reader by maintaining the writer-reader interaction, but also on it fulfilling the requirement to advance the argument relevant to the macro-goal (i.e., the claim of significance advanced in the introduction subgenre) of the text in question. Interview data from the writer of EX1A showed that in the selection of ST devices (e.g., hedges to show deference), they consciously engaged in CT which recognised the relationship between the interpersonal goal (e.g., critical but fair minded) and the argument goal (advancing their claim of significance) they wanted to achieve.

> Interviewee (text EX1A): Mainly I appeal to the argument goal and its corresponding stance that is to be adopted in a particular phase of the chapter. For example, in Section 1.2.5, the goal is gap creation, so the corresponding stance is mainly critical. But critical is not just going about the attack – there are also considerations about authorial credibility and fair-mindedness that I am mindful of – so I also take care to hedge (e.g., limited [hedge] relevance), and to give credit where credit is due (e.g., these studies in general [hedge] shed light). Overall, I want to impress on the reader that there's been much already done in the field, but there're also blind spots that my study will try to address.

The writer of EX1B also selected ST devices (e.g., attitude markers) to achieve the local rhetorical-argument goal of claiming centrality (*why my particular study was important*) for the research territory of the study they were constructing.

> Interviewee (text EX1B): Right, yea. I guess I did that [used attitude]. I tried to show why my particular study was necessary or important. Yea.

In addition, the CT process of seeing and establishing links between the argument goals of the different segments of the arguments in a text would also be necessary for recognising how the ST device contributes to advancing the macro-argument. This is because the macro-argument of the introduction comprises several arguments such as those found in the various subsections of the text.

Other CT processes in text construction that were inferred from the analysis of ST devices included CT processes specific to ST such as the CT process of recognising the need for the use of an ST device, the CT process of anticipating (Raths, et al., 1986) the reader's reaction or their position with regard to a claim being advanced and the CT process of evaluating the strength of claims being made (Beyer, 1995; Black, 2008; Facione et al., 1990; Gubbins, 1985). The interview data from the writer of EX1A below shows how the reader expectations for them to be explicit about the territory they were proposing to study (*need to occupy the niche*) and the contribution they were expected to make (*the significance of the study*) as well as the strength of their claims (*the study's findings have yet been presented, so you don't be so presumptuous so to speak*) influenced their decisions about hedged and unhedged claims.

> Interviewee (text EX1A): There is a fair balance of hedged and unhedged statements of significance, and this is due to the tension between the need to "occupy" the niche, as well as not overstating the significance of the study (bearing in mind that this is only Chapter 1 – the study's findings have yet been presented, so you don't be so presumptuous so to speak). So in cases where I feel it okay to be a bit more assertive, I assert; in other cases, especially where other stakeholders are involved (GP teachers, EAP teachers in higher education) and I can't speak on their behalf, I hedge.

The CT process of evaluation in ST includes other CT processes such as noticing similarities (Raths et al., 1986) among information in the literature that consistently point to a claim and the CT process of recognising and constructing links (Beyer, 1985; Sternberg, 1986) that determine the relevance between the claim in the literature and the writer's research.

The CT process of predicting the likelihood (Raths et al., 1986) of the reader accepting the writer's claim through the related CT process of anticipating the reader's beliefs, objections and positions, and evaluating the strength of the writer's claims, can be said to lead to the CT process of making a judgement about the ST device (Gubbins, 1985) that would best gain the reader's acceptance of the claim being advanced by the writer. The decisions on what ST device to select based on this judgement would include those related to persuading through certainty

and deference (use of hedges and boosters), those related to persuading through establishing common grounds (use of attitude devices) and those related to persuading through exerting a more personal and direct intrusion into the text (self-mention) to position the writer in a manner that will convince the reader to accept the claim being advanced. It is not unreasonable to assume, that in selecting ST devices, writers would also consider using those that they would be more confident in using thereby tending to overuse some devices at the expense of others. The CT process related to this is likely to be formulating alternative solutions (Gubbins, 1985) or responding to dilemmas (Black, 2008).

The section that follows will explicate with examples from GA analysis and the patterns observed in the quantitative data how CT could contribute to the differences in the effectiveness of ST selection and use and their impact on the rhetorical quality of EX and NE texts. The section will cover CT in the selection and use of epistemic evaluation, attitude and personal intrusion respectively.

7.2.1 CT in the selection and use of ST devices in EX and NE texts.

A significant difference observed in the selection and use of epistemic stance reported in Section 7.1.1 was that hedging in EX texts was within the top two ranks of ST devices used, with a mode of 5.1, while it was in the bottom two ranks of devices used in NE texts, with a mode of 1.9. Both groups also seemed to display a low use of boosters with NE (0.9) showing a higher median that EX (0.7) texts. The examples that follow have been selected to show how CT could account for instances of differences in the appropriate use of hedges, appropriate non-use of hedges and the appropriate degree of assurance or probability to accord claims.

In Excerpt 7.1, the decision to effectively hedge (*broadly*) the first claim about a generally accepted definition of academic criticism is likely to have involved several CT processes working in concert.

The selection and use of the hedge *broadly* for the definition of academic criticism, which is supported with a string of citations (*Stotesbury, 2006; Giannoni, 2005; Holmes, 2009*), suggests that the CT process of noticing similarities among information in the literature consistently pointing to the same definition was in operation. It also suggests the writer hedges their definition to keep the discursive space for differences open for alternative views through engaging in the CT process of anticipating alternative definitions from readers because of their awareness of the possibility that their readers may hold other definitions. In addition, the CT process of noticing similarities and differences in the literature on definitions related to

academic criticism, would have led to the CT process of evaluation of the information in the literature, enabling the writer to accord the appropriate level of doubt (hedging) or certainty (boosting) to the claim related to the definition of academic criticism.

The awareness that the writer should hedge in the above-mentioned conditions is associated with socially aware thinking or genre awareness, which requires the engagement in other CT processes. The CT process of differentiation would have enabled the writer to differentiate relevant from irrelevant information in the sociocultural context, and the CT process of interpretation would have enabled the writer to interpret, from this context, the social goal associated with ST use (advancing the claim of significance of the introduction subgenre in a manner acceptable to the reader). In addition, for hedging to be rhetorically effective, the CT process of seeing and constructing links between the interpersonal rhetorical goal of the ST device (to signal acknowledgement of alternative views that readers may have) and the macro-rhetorical-argument goal of the introduction subgenre (to argue for the claim of significance of the writer's proposed study) would have needed to be in operation. This CT process can be said to have facilitated the outcome observed in the relevance between what was hedged (the definition of academic criticism) and the local argument goal (to build a research territory for academic criticism) that contributes to the argument for the need of a study on this topic, as inferred from the research question (*what evaluative meanings characterise successful enactments of academic criticism?*)

Excerpt 7.1: EX1A's appropriate use of hedging

Excerpt 7.1
1.2 Background and problem
Academic criticism, broadly (hedge) defined as the linguistic expression of negative evaluation or disagreement (Stotesbury, 2006; Giannoni, 2005; Holmes, 2009), is a central feature of sound academic argumentation. (M1)
Most (hedge) genres of writing at higher levels of education require students to enact evaluation to convey an attitude to both those they address and the material they discuss" (Hyland & Diani, 2009, p. 5) as they assert and maintain a position on an issue. (M1)
Research question   What evaluative meanings characterise successful enactments of academic criticism?

The selection and use of the second hedge (*most*) to withhold the certainty of the claim that the enactment of evaluation is a requirement for writing in higher education can be said to involve all the CT processes discussed in the selection and use of the hedge (*broadly*) in the previous

claim on the definition of academic evaluation. In the present instance of hedging, it is reasonable to speculate that the main reason for withholding a commitment to certainty is that, based on the CT process of evaluating information in existing literature, the writer could not be sure that academic criticism was required in all genres in higher education and concluded there could be some genres that did not require the enactment of academic criticism. Given these conditions, the writer is likely to have engaged in the CT process of anticipating the reader's reaction and predicted opposition to their claim if they had not hedged it.

The next Excerpt 7.2, taken from NE1C, provides an example of hedge use that only contributes to the local argument of building a research territory for the writer's study on task prompts and writing. The selection of both hedges (*likely, might be*) can be said to involve all the CT processes discussed in the previous EX text. The first hedge (*likely*) is effective in withholding commitment to the writer's claim that hypothesises the purported relationship between task prompts and writing. The second hedge (*might be*) provides a speculative reason (difference between the students' interpretation of task prompts and the actual requirements of task prompts) to support the hypothesis in the first claim. The CT process involved in the selection of these hedges would have included recognising the need to signal the hypothetical and the speculative nature of the claims and anticipating the reader's expectation for the writer to hedge such claims. In addition, the CT process of recognising and constructing links would have resulted in the relevance observed between what is hedged in the hypothesised and speculative claim that constructs the local argument for the research territory of the study and the macro-argument for the need of a study on the relationship between task prompts and writing, as indicated in the research question (*what do research project task prompts require of novice writers? What do novice writers understand of these requirements?*). Although the hedges selected and used in this excerpt are relevant to the macro-argument advancing the need for the writer's study, they do not contribute to it effectively. This is because the argument advanced through the hedges in this excerpt do not relate to the argument in the previous section of this introduction (not included in this excerpt), suggesting that the CT process of seeing and establishing links between different segments of arguments in the introduction was inactive or underutilised in the selection and use of hedging in these examples.

Excerpt 7.2: NE1C's use of hedging that only contributes to the local argument (the research territory)

Excerpt 7.2
1.3 Rationale for the study
Task prompts – Writers' understanding of task prompts and task expectations are likely (hedge) to affect the manner in which the research is carried out and how the research paper is written up. (M1)
For example, students' interpretation of the expected genre of the research paper might be (hedge) different from the requirements of the task prompts. (M1)
Research question What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?

The next Excerpt 7.3, taken from EX1A, provides an example of effective unhedged claims. In contrast to Excerpt 7.1, which provided examples of the selection and use of hedges in claims, this excerpt provides examples of claims that do not require hedging (*academic criticism… is a genre practice characteristic of argumentative writing, the centrality… is well acknowledged*). The CT process of noticing similarities among information in the literature (*Cheng, 2006; Holmes, 2009; Hunston, 1993*) would have pointed to a strong occurrence of academic criticism in argumentative writing. In addition, the information in the first claim would have been augmented through the second set of literature (*e.g., Hunston, 2005; Salager-Meyer & Zambrano, 2001; Stotesbury, 2006*) used by the writer to lend support the initial claim. In this set of literature, the same CT process of recognising similarities in the literature would have pointed to the well-acknowledged relationship between academic criticism and argumentative writing. The CT process of evaluating the strong relationship between academic criticism and argumentative writing in the existing literature would likely have resulted in the CT process of anticipating that the readers would accept this claim. The resulting decision to withhold hedging is hence appropriate in this context where the claims seem to be highly certain.

Excerpt 7.3: EX1A's appropriate avoidance of hedging

Excerpt 7.3
1.1 Introduction
Academic criticism, the expression of a discrepancy in stance between the author's position in an essay and the opposing view, is (unhedged claim) a genre practice characteristic of argumentative writing (Cheng, 2006; Holmes, 2009; Hunston, 1993). (M1)
The centrality of academic criticism in the argumentative genre is (unhedged claim) well acknowledged (e.g., Hunston, 2005; Salager-Meyer & Zambrano, 2001; Stotesbury, 2006). (M1)
Research question   What evaluative meanings characterise successful enactments of academic criticism?

In contrast to Excerpt 7.3, Excerpt 7.4, from NE1D, provides an example of an ineffective unhedged claim. In this excerpt, the writer's claim about the community they refer to (*it*) as upholding *a non-English speaking culture* can be challenged by the reader. This is because it is not plausible for any community to be totally homogenous in their language practices, as there would most likely be pockets of variation in language practices. The decision to not hedge the claim with hedges such as "generally," "tend to" or "mostly," for example, suggests that the writer many not have exercised a CT process such as carefully evaluating the information advanced in the claim. This process is likely to have led to the related CT process of inaccurate anticipation of the reader's reaction to this absolutist claim. These processes could have been underengaged due to a lack of genre knowledge associated with managing reader interaction through the signalling of caution in persuading the readers to accept claims or arguments.

Excerpt 7.4: NE1D's lack of hedging

Excerpt 7.4
1.1 Research background
Although it upholds (unhedged claim) a non-English speaking culture, it places (unhedged claims) a heavy demand upon postgraduate education which is expected to approximate the standards that are found in Britain in terms of English medium instruction, dissertation writing and other academic research. (M1)
Research question   What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section? Why do they have these problems?

In contrast to the example of the underuse of hedging in NE1D, as shown in Excerpt 7.4, is the example of the possible overuse of boosting in NE1D. The quantitative data from Table 7.5 showed that this writer used more boosters (1.7) than hedges (1.0) and this pattern of use

differed from the conventional pattern in the other texts in the EX and NE samples, where the density of hedges is higher than that of boosters.

Excerpt 7.5 shows the seemingly effective use of a cluster of boosters (*still, even, even, much less*) to amplify the claim on the severity of the lack of research on the discussion and conclusion subgenre of thesis writing for the social sciences. The general CT processes introduced earlier can be assumed to be in operation to achieve the successful selection and use of these boosters. To highlight a few, the CT process of seeing and constructing links between the interpersonal goal of the ST device (to signal certainty of a claim that is in line with the convictions of the readers), the local (to create a research gap for the writer's study) and macro-argument goal (to legitimise the need for the study on the discussion and conclusion subgenre in thesis writing for the social sciences) of the text can account for the relevance of boosting a claim that contributes to the gap required to justify the writer's proposed research. The CT process of evaluating existing research on limitations of studies in the area of the discussion and conclusion subgenre, and the CT process of anticipating that the reader would have similar judgements about the gap in the literature, would have resulted in the selection of the four certainty markers to boost the claims in the excerpt.

It would, however, seem that, in view of the overall pattern of use of hedges and boosters to signal doubt and certainty in this text, this writer may have had difficulties in achieving the appropriate degree of assurance and certainty in writing. The CT processes associated with achieving the appropriate degree of assurance and probability in writing would be the ability to judge when hedging was required and perhaps when boosting was not required. It appears that NE1D underuses hedges and perhaps could be said to also overuse boosters. According to Hyland and Milton (1997), writers may be unable to make this judgement when they incorrectly perceive that the social demands of the discipline require them to be explicit and direct (assertive) in their writing and/or if they find it challenging to judge "the appropriate degree of assurance or probability" (Hyland & Milton, 1997, p. 200) to accord to claims.

Excerpt 7.5: NE1D's effective but relatively high use of boosting

Excerpt 7.5
1.1 Research background
Research on the Discussion & Conclusion section is still (booster) limited compared to that of the Introduction and even (booster) scarce in the case of thesis writing genre for social sciences. (M2)
As far as thesis genre is concerned, even (booster) fewer studies have ever probed into this particular part-genre. (M2)

Much (booster) less attention has been given to it from the process perspective or to how this part-genre can be related to the opening Introduction chapter. (M2)
Research question What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section?

The significant differences observed in the selection and use of attitude devices reported in Section 7.1.1 is that though the use of hedges ranks the top two most frequently used devices in EX texts and can be said to reflect the distribution found in expert-written texts, the use of attitude devices ranks higher than the use of hedges, unlike the expected conventional practice. NE texts display a similar pattern of attitude use as EX texts where attitude ranks in the top two most frequently used ST devices. The mode of attitude use in the NE texts (2.3) was, however, much lower than the mode in EX texts (5.1). There was also one text in the NE sample that seemed to display an overuse of attitude.

Excerpt 7.6, by EX1A, is an example that displays a rhetorically effective use of attitude. The selection of attitude markers (*increasingly, important*) signal the use of affect, which conveys the writer's feelings rather than their commitment (doubt or certainty) toward the claim that academic criticism is a genre practice that students should master. In deciding to select the use of attitude as a persuasive device, the CT process of anticipating the reader would share the sentiment that students should acquire this genre practice is likely to have directed this decision. Hence, by signalling an "assumption of shared attitude, values and reactions" (Hyland, 2005b, p. 180) to this practice, the writer is able to persuade in a manner expected by the reader. The selection of the device is aimed at pulling "the readers into a conspiracy of agreement so that it is often difficult to dispute these judgements" (p. 180). The CT process of seeing and constructing links would also have been in operation to achieve the relevance observed between the interpersonal goal of convincing the reader of the importance of studying academic criticism, the local argument goal of building a research territory for the study of academic criticism and the macro-goal of arguing for the need to study academic criticism (*what evaluative meanings characterise successful enactments of academic criticism?*)

Excerpt 7.6: EX1A's effective use of attitude

Excerpt 7.6
1.1 Introduction
As higher levels of education (e.g., post-secondary and beyond) increasingly (attitude) employ the argumentative essay as a tool for evaluating students' achievement, the ability to gain control or mastery of the genre practice of academic criticism can have important (attitude) implications for students' academic progress and success. (M1)
Research question What evaluative meanings characterise successful enactments of academic criticism?

To account for the higher density of attitude over epistemic-stance use in EX and NE texts, it is reasonable to speculate that the use of attitude devices poses less of a "risk" to novice writers than the use of epistemic devices. This is because attitude devices do not signal epistemic evaluation that may be in conflict with the positions and convictions of the more experienced academic reader. It is a common understanding in the literature that novice writers find it challenging to evaluate the work of more established and experienced academic readers (Belcher, 1995) Apart from that, it is possible that attitude markers are used more because novice writers find decisions about certainty and doubt difficult to make (as mentioned earlier) and being "writers-in-training," would require time to gain competence in the use of these devices (Hyland & Milton, 1997). The CT process related to this is likely to be formulating alternative solutions (Gubbins 1985) or responding to dilemmas (Black, 2008).

More evidence of compensating for the non-use of one set of devices by using another can be inferred from Excerpt 7.7, taken from NE1D, and from the overview of NE1D's stance use in Table 7.5. The density (8.2) of attitude markers in this text is the highest in both EX and NE groups (Table 7.7, Section, 7.1.1) and only slightly less than the density (8.6) in expert-written texts (Table 7.4). In comparison, the writer displays a very low (1.0) use of hedging. This text also displays an unconventional pattern of booster use that is higher than the writer's hedge use and relatively higher (1.7) than the use of boosters in the other texts (0.4, 1.0, 1.2, 0.4, 0, 7, 0.5, 0.5) in the EX and NE sample.

In Excerpt 7.7, NE1D displays the use of attitude that is comparable in effectiveness to the use of attitude in the previous Excerpt 7.6, by NE1A. The attitude devices (*growing, overwhelming, predominantly*) signal the writer's sentiment about the existence of abundant research on various aspects of research articles, which they use as a contrast to the gap in research on the discussion and conclusion subgenres in thesis writing in social science. The selection of these

devices would, as in the case of EX1A, have involved the CT process of anticipating the reader's shared sentiment on this claim. The success of its use would also have involved the CT process of seeing and constructing links between the interpersonal goal of convincing the reader through the shared sentiment of the existence of abundant research in some aspects of research writing over others, and the local argument goal of exposing a research gap for the writer's study on the discussion and conclusion subgenre and the macro-goal of arguing for the need of a study in this area (*what are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section?*).

Excerpt 7.7: NE1D's effective but relatively high use of attitude

Excerpt 7.7
1.1 Research background
The second concern can be embodied by a brief overview of the limitations of the previous studies on relevant research writing. (M2)
Although a growing (attitude) body of studies have examined various aspects of research articles (RAs) such as Abstract, Introduction, Literature Review, Results in the past two decades, an overwhelming (attitude) majority of the them are directed towards Introduction (e.g., Anthony, 1999; Holmes, 1997; Ozturk, 2006; Samraj, 2002; Swales, 1981, 1990, 2004) and predominantly (attitude) deal with the texts produced in natural sciences. (M2)
Research on the Discussion & Conclusion section is still (booster) limited compared to that of the Introduction and even (booster) scarce in the case of thesis writing genre for social sciences. (M2)
Research question   What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section?

Although the CT process of formulating alternative solutions (Gubbins 1985) or responding to dilemmas (Black, 2008), which seems to be at play in the selection of attitude over epistemic ST devices, can help novice writers cope with their limitations in the use of ST genre conventions, the relatively low use of epistemic stance in both EX and NE texts cannot compensate for the critical need of these writers to gain competence and confidence in the use of epistemic stance, which requires them to make judgements about the appropriate level of certainty and doubt to accord to claims (Hyland & Milton, 1997).

The significant difference observed in Table 7.2 in the use of personal intrusion in EX and NE texts is that while personal intrusion ranks in the bottom two frequently used ST devices in EX texts, similar to the distribution in expert-written texts, it ranks in the top two most frequently used ST devices in NE texts. In spite of the high ranking of this device displayed in NE texts,

Table 7.5 shows that the density of the devices in the NE sample (2.2) is still lower than those in the EX sample (3.9). Also, as was the case in the selection and use of attitude devices, there was one text, NE1C, that seemed to display a relatively high use (6.5) of personal intrusion markers.

In Excerpt 7.8, EX2A uses personal intrusion to successfully achieve the interpersonal goal of making explicit the writer's personal perspective by identifying with an argument in the literature (Hyland, 2008). The CT process of seeing and constructing links between a claim in the literature (*key to successful commenting is to have what is said in the comments and what is done in the classroom mutually reinforce and enrich each other*) and the writer's personal experience (*my observation of current practices of several teachers… however, what is taught… not adequately reinforced in the comments*) would have contributed to the CT process of recognising an instance for displaying ST through direct intrusion or through the use of personal intrusion. In this instance, the writer uses their personal experience to compare with an existing claim in the literature to "identify with an existing argument in the literature" (Hyland, 2008, p. 181). They also use this identification to "gain credit" (p. 181) for their perspective by showing how the comparison exposes a research problem that needs to be studied. In so doing, they also achieve the interpersonal goal of "distinguish[ing] the writer's work from that of others" (Hyland, 2008, p. 16)

Apart from achieving their interpersonal goals of "how they stand in relation to their argument, their discipline and their readers" (Ivanic, 1998, cited in Hyland, 2005b, p. 181), the writer's use of personal intrusion also contributes to achieving the local rhetorical-argument goal of creating a research territory and gap for their study and the macro-argument goal of legitimising the need for a study on teacher comments, as reflected in the research question (*are students of average proficiency in English able to interpret written teacher comments in the same sense as intended by the teacher?*). For the writer to have successfully fulfilled the interpersonal as well as the argument goals of the text, the CT process of seeing and constructing the link between the interpersonal goal of the ST device (presenting an explicit authorial self), the local argument goals (creating a research territory and exposing a research gap) and the macro-argument goal (justifying the need for a study on feedback and teaching), as reflected in the research question, would also have had to be in operation.

Excerpt 7.8: EX2A's effective use of personal intrusion

Excerpt 7.8
1.1 Background and Problem to the Study
In addition, teachers need to be very conscious that one "key to successful commenting is to have what is said in the comments and what is done in the classroom mutually reinforce and enrich each other" (Sommers, 1982, p.155). (M1)
Based on my (self-mention) observation of current practice of several teachers at the JC level, well-intentioned teachers in evaluating students' writing feel the responsibility to respond to student errors both in reasoning and expression, and to correct high frequency errors although these different areas have not been examined and discussed at length in previous lessons… (M1)
However, what is taught and emphasised in the previous lesson was not very adequately reinforced in the comments… (M2)
Little empirical research seems to have been done on students' ability to interpret and act on given teacher comments as intended by the teacher, in addition to problems that may hamper their efforts to make use of written teacher feedback to improve the quality of arguments. (M2)
Research question Are students of average proficiency in English able to interpret written teacher comments in the same sense as intended by the teacher?

In contrast to Excerpt 7.8, the use of personal intrusion in Excerpt 7.9, by NE1C, is effective only in achieving the text's interpersonal rhetorical goals but not its macro-rhetorical-argument goal. The CT process of seeing and constructing links between a claim in the literature about the conventional profile of freshman composition students and the students in the writer's personal context would have contributed to the CT process of recognising an instance for the displaying of ST through direct intrusion. As was the case in Excerpt 7.8, the writer uses their personal context to compare with claims about students existing in the literature. The writer also uses this comparison to gain credit for their perspective by showing how it justifies the need for the use of a chosen theory (*some aspects of socialization theory),* the need to apply a suggestion (*to expose students to texts from various fields*) from the literature (*Bhatia, 1993*) and the need to examine expert writing (*to examine various types of discourse structures used by expert writers).* The writer achieves the interpersonal goal of "distinguish[ing] the writer's work from that of others" (Hyland, 2008, p. 16) just as successfully as the writer of EX2A.

The writer of this text has also successfully achieved the argument goal of providing information on the territory of their own research. Similar to EX2A, this would have required the CT process of seeing and constructing links between the interpersonal goal of the ST device

(presenting an explicit authorial self) and the local argument goal (creating the territory for the writer's proposed research).

The selection and use of personal intrusion in this excerpt, however, does not contribute to the macro-rhetorical-argument goal of justifying the study of task prompts in research writing because the CT process of seeing and establishing links between the different segments of arguments in this text was inactive or underutilised in contributing to the logical sequencing of the various arguments in the subsections of the text. This excerpt, taken from a section that describes the territory of the writer's own research, was not preceded by a section that built the study's research territory or exposed the research gap(s) required to construct the macro-argument of the text (justifying the need for the writer's study on task prompts in research writing).

Excerpt 7.9: NE1C's use of personal intrusion demarcates their study but does not contribute to the macro-argument

Excerpt 7.9
1.1 Context of the study
Even in their second year, however, the students in my (self-mention) study did not fit the conventional description of a student in a freshman composition class… (M3)
However, given that learning to write academic papers is dependent on the writer's sense of belonging to the community, and given that the students in my (self-mention) study were themselves becoming members of the university, I (self-mention) felt justified in drawing on some aspects of socialization theory to explain the writer's role in negotiating the complex nature of the text. (M3)
Indeed, this was deemed essential to my (self-mention) study because in order to make an informed assessment of the text, it was important to find out the meaning attached to it by the writers themselves. The exact nature of which was unspecified at the time. (M3)
This made it difficult to analyze the texts in my (self-mention) study on the basis of the conventions and norms of any one particular discipline… (M3)
The broad areas of research suggested in the task prompts examined in my (self-mention) study allowed students to explore Bhatia's (1993) suggestion that novices read texts written by experts in a number of different fields and become aware of the conventions and norms of academic writing across disciplines… (M3)
Thus prior to examining the discourse organizational structures in the novices' writing, I deem (self-mention) it proper to examine the various types of discourse structures that are used by expert writers. (See Chapter 3.) (M3)
Research question What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements? How do novice writers organise their research papers in meeting the demands of the task prompts?

It is not unreasonable to attribute the high density of self-mention in this text to the underutilisation or inactivity of the CT process of seeing and establishing links between different argument segments of the text. This is because the text does not display a conventional macro-argument structure (research territory and research gaps leading into the territory of the writer's own study) and the occurrence of self-mention was found in the unusually high proportion of arguments related to demarcating and presenting information on the writer's own study.

7.3 Summary

This chapter has reported on findings related to the selection and use of ST devices in the introduction subgenre of EX and NE texts. EX texts exhibited differences such as a markedly higher density of ST devices than NE texts and a distribution of ST devices that better aligned with the distribution exhibited in expert-written texts. EX texts, unlike NE texts, did not display instances of exceptionally high densities of ST devices.

The several CT processes, which were inferred to operate in the selection and use of moves and citations (e.g., interpreting social goals, differentiating information, constructing goals, goal direction, seeing and constructing links), could account for the differences in the selection and use of ST devices. CT processes in the selection and use of ST devices could account for the effective use of ST devices, the partially effective use of devices, i.e., those that fulfil the interpersonal and local argument rhetorical goal but not the macro-argument goal, and the distribution of devices that resulted in an ineffective persuasive quality of texts.

The operation of CT in the selection and use of ST devices, as was the case in the selection and use of moves and citations in text construction, is a highly complex process. A combination of CT processes operates in concert in the selection and use of ST devices to advance claims in a manner acceptable to the readers within a discipline. Unique to the selection and use of ST devices is the CT process of anticipating the reader's response to claims through the CT process of assessing their beliefs, values and positions against the evaluation of claims being advanced by the writer. The success of ST decisions was also dependent on other CT processes such as seeing and constructing relationships between the interpersonal goals, local argument goals and macro-argument goals. An under-engagement or suppression of the CT process of seeing and constructing links between arguments in different sections could be inferred to account for some of the selection and use of some ST choices that were only partially successful. It was

also inferred that the CT process of formulating alternative solutions or responding to dilemmas could have accounted for how writers compensated with the use of one device they were confident about for another.

The list of some of the CT processes inferred to have collaboratively contributed to the selection and use of ST devices includes:

- Interpreting social goals
- Differentiating relevant information
- Creating rhetorical goals
- Goal-directed thinking
- Seeing/recognising and constructing links between the interpersonal goal, local argument goals and the macro-argument goal
- Seeing/recognising and constructing links between the arguments in the sections that contribute to the macro-argument of the text
- Recognising the need for using an ST device
- Anticipating reader reaction
- Noticing similarities among information in the literature
- Seeing/recognising and constructing links between the literature and the writer's research
- Evaluating the strength of claims
- Formulating alternative solutions or responding to dilemmas

Chapter 8 (Discussion 2)
The nature and role of critical thinking in academic writing and its pedagogical implications

The aim of this chapter is to draw on the findings and discussion presented in Chapters 5, 6 and 7 and the literature covered in Chapters 2 and 3, to present an integrated representation of the nature and role of CT in academic writing, using the genre of the doctoral thesis introduction. The processes and the descriptions of how they might operate, interact and interrelate with one another during the operation of CT in academic writing as they were identified and explicated in Chapters 5, 6 and 7 will be assembled in this chapter into the core facets (strands) of thinking behaviours which constitute the construct of CT in academic writing.

The chapter is divided into five sections. Section 8.1 commences with a discussion of the nature of CT in academic writing in terms of the various facets that were uncovered from the findings chapters, using genre analysis and the CT theoretical framework developed in this study. In so doing, it also illuminates the role of CT during decision making in text construction, by exposing how it influences and shapes the writer's choices during the execution and organisation of moves, during decisions on what sources to cite and for what purpose and during decisions on the resources the writers use to make their stance to persuade readers. Data from the findings chapters is used to show how the extent to which writers engage in CT during the composing process strongly accounts for the quality of writing observed in EX and NE texts. Section 8.2 will then present claims about the knowledge required for the operation of CT which are extrapolated from the results and discussion in Chapters 5, 6 and 7.

Section 8.3 extends the discussion to the broader literature covered in Chapter 1 in order to place the various terms and interpretations of CT mentioned there within the framework of understanding developed in this study. In so doing, this chapter reinterprets the existing literature on CT to present a more explicit interpretation of the notion, grounded in genre analysis and selected interview data. The purpose of the rereading of the literature on CT is to offer students and academic writing teachers a more specific, more refined and a less nebulous picture of CT that they could use to further develop student writers' critical thinking skills and improve the outcomes of their text generation efforts.

Section 8.4 uses the claims about the nature and role of CT to argue for the conditions of learning environments that can facilitate the acquisition of CT knowledge and thinking for the construction of rhetorically successful texts. Section 8.5 summarises the chapter

8.1 The Facets of CT in Academic Writing

CT in academic writing has most commonly been narrowly associated solely with the exercise and display of critical evaluation or analytical judgement of literature belonging to a specific field or subject, at the expense of the other facets and subfacets of CT uncovered in this study. This was evidenced in most of the interpretations of CT covered in existing academic writing literature discussed in section 1.1. It was also pointed out there that the existing conceptualisation of the notion in the academic writing literature remains fragmented and incomplete, making it difficult for students to make sense of it and for supervisors and writing professionals to provide adequate guidance and understanding to students who are expected to display CT in academic writing.

This study, using genre analysis with the CT framework developed in Chapters 2 and 3, has found that CT in academic writing has many more facets, instantiations and shades of meaning (definitions based on the facets of CT) than is typically made explicit. Table 8.1 introduces the three core facets, subfacets and instantiations of CT as well as the shades of meaning that can be attributed to the facets, Column two of the table shows the elements of the CT construct and the possible thinking processes that could make up the facet, column three shows how the facet can be realised in a text and column four provides a definition of CT that interprets the facet of CT in question.

Table 8.1

Facets, Instantiations and Shades of Meaning of CT in Academic Writing

Facets/subfacets of CT	Elements and some examples of thinking processes constituting the CT facet	Instantiations of the CT facet	Definition of the facet that constitutes a shade of meaning of CT
CT occurring in problem solving	Problem solving (Flower, 1987; 1994; Flower & Hayes, 1981) involving thinking processes such as: applying genre knowledge to interpret (Beyer, 1995;	**Problem occurs in:** e.g., move, stance-taking and citation choices among other genre choices made during text construction	CT is engaging in social-cognitive reasoning to solve a writing problem

	Facione et al., 1990; Raths, et al., 1996) conventions of genre features form the sociocultural context	**Problem involves**: e.g., move choices. what move to make next	
	differentiating relevant from irrelevant knowledge (Beyer, 1995; Sternberg, 1986)	e.g., citation choices whether to cite more of the literature or evaluate the literature already cited	
	selecting information (Gubbins, 1985)	e.g., stance-taking devices	
	setting goals from relevant information in the social context outcomes (Beyer, 1985; Gubbins, 1985)	whether to persuade through assertion, deference, collusion or intrusion	
	applying goal-directed thinking (Flower & Hayes, 1981; Halpern, 1998)	**Problem solved:** e.g., with reference to the micro rhetorical-argument goal such as to create a research gap and the macro-rhetorical-argument goal to construct a need for the writer's proposed study	
	anticipating or predicting reader's expectations (Black 2008; Raths et al., 1986) (e.g., scepticism, opposing view) planning strategy to address/ manage the reader's response (Ennis, 1987; Gubbins, 1985; Sternberg, 1986)	e.g., with reference to the citation function required to achieve the micro/local- and macro-rhetorical goal	
	seeing links (Sternberg, 1986)		
	constructing links (Beyer, 1985)	e.g., with reference to the reader's position, beliefs and biases	
CT occurring in knowledge transformation	Problem solving (Flower, 1987, 1994; Flower & Hayes, 1981) involving all the above-mentioned thinking processes	**Problem occurs in** e.g., in deciding how to use devices such as citations from source texts to exhibit new and novel uses in a new text.	CT is engaging in knowledge-transforming processes to apply source information in new and novel ways to construct the
	+ solving the problem of selecting and re-casting		

	source knowledge to serve a new rhetorical-argument goal (Scardamalia & Bereiter, 1991; Spivey, 1990) involving thinking processes such as: reconfiguring (Sternberg, 1986) the cited source to serve a new purpose interweaving (Bailin et al.,1999b; Beyer, 1995) the source information to fit the developing text by making connections between citations and between citations and the text (Beyer, 1995; Sternberg, 1986)	**Problem involves** e.g., how to use the source text to serve the argument goal of the new text such as how to transform a cited author's use of research method x to serve as legitimisation of the writer's intended adapted use of the same method **Problem solved** with reference to constructing a relevance link between an aspect of the cited knowledge to the writer's intended research method reorganising the cited knowledge to cast the writer's method as justified	argument of the text being created
CT occurring in normative evaluation (epistemic subfacet)	Problem solving (Flower, 1987, 1994; Flower & Hayes, 1981) involving all the thinking processes for problem solving + epistemic-normative evaluation (Beyer, 1995; Burbules & Berk, 1999; Toulmin, 1984, 2004) involving CT processes such as: identifying components of arguments judging credibility of evidence	**Problem occurs in** epistemic-stance-taking devices, citations used evaluatively and in all genre solutions (decisions) that need to be assessed for their effectiveness **Problem involves** determining strength to accord a claim being advanced, determining the evaluation to accord source information	CT is engaging in epistemic evaluation that results in an outcome such as an epistemic stance taken to signal the writer's position on the strength of a claim evaluated, an outcome that exposes a gap in the literature to justify the writer's proposed study or an outcome that confirms the soundness of the solution to a genre problem

	identifying unstated assumptions detecting bias identifying logical fallacies recognising logical inconsistencies in a line of reasoning	(+ve or -ve), determining the claim of effectiveness of a genre decision arrived at through problem solving **Problem solved** by analysing evidence, warrants, counterarguments that construct claims	
CT occurring in normative evaluation (non-epistemic subfacet)	Problem solving (Flower, 1987, 1994; Flower & Hayes, 1981) involving all the thinking processes for problem solving + non-epistemic evaluation (Halpern, 1998; Kurfiss, 1988) involving CT processes such as evaluating genre decisions by assessing the fit between/among: the decision and the micro-/macro-rhetorical-argument goal the genre decision and reader expectations the rhetorical-argument goal and interpersonal or intertextual (citation) goal citations serving a common purpose the purpose of citations and the writer's actual intention fit among decisions within and across subsections of a texts +	**Problem occurs in** all genre choices **Problem involves** determining the effectiveness of the problem-solving process involved in solving a genre problem **Problem solved** though assessing problem-solving reasoning that examines that the relevant goals, reader expectations and links between various categories have been considered in arriving at a genre solution	CT is engaging in non-epistemic evaluation to complete the last step in the problem-solving process. Non-epistemic evaluation works in tandem with epistemic evaluation to complete the review of the effectiveness of solutions to genre problems

epistemic evaluation involving all the above-mentioned epistemic evaluation processes to defend the soundness of a solution reached

The nature and role of CT in each of the facets and how it can be said to account for the differences in the rhetorical quality of genre choices in EX and NE texts nominated exemplary and less exemplary in their display of CT, will be discussed in greater detail in the sections that follow. Figure 8.1 provides a representation of how the construct of CT theorised in Chapters 2 and 3 is instantiated in a constructed text. It presents the model of CT which includes the two operational components (problem solving and normative evaluation) theorised and the facets, mental processes and the instantiations of the theoretical construct derived from text analysis. The discussion that follows refers to the model conceptualised in this figure. A point to note at this juncture is that the thinking-processes facets and instantiations of CT presented here are only a starting point for a contextual understanding of a highly complex construct and are by no means implied to be exhaustive.

Embedded Construct

Problem-Solving Component

CD

problem
-solving
reasoning

SD

**mental
processes**
e.g.,
differentiate

interpret

infer

identify

standards
(beliefs, values, practices)
e.g., genre norms
interaction norms
knowledge creation norms

TR
+
GS

**goals directing
decisions**
e.g.,

reader goal

interpersonal
goal

textual goal

intertextual
goal

**outcomes/
decisions**
e.g.,

text's purpose

writer stance

move structure

citation function

Normative Evaluative Component

NEE

(judgements about
what to do)

EE

(judgements about
what to believe)

**mental
processes**
e.g.,
examine

justify

anticipate

estimate

CD

logical
reasoning

SD

standards
(beliefs, values, practices)
e.g., relevance of data
validity of evidence
appropriacy of backing

Embedded Construct

Embedded Construct

Embedded Construct

The arrow indicates the outcome (below)
achieved when the theoretical construct (above)
was applied in genre analysis. It shows how the
CT construct can be realised in texts.

mental processes
goal-directed thinking
anticipating/predicting
reader expectations
seeing links
constructing links

CT realised
as genre
choices

Facet 1
CT occurring
in PS

Facet 2
CT occurring
in KT

CT
realised
as
citation choices

mental processes
e.g.,
reconfiguring
interweaving

mental processes
e.g.,
judging credibility of
evidence

identifying unstated
assumptions

CT
realised
as
evaluative citations
epistemic stance
genre choices

Facet 3A
CT occurring
in NE (EE)

mental processes
e.g., assessing fit
between genre decision
and reader expectations

between genre decision
and micro/macro-
rhetorical goals

CT realised
as genre
choices

Facet 3B
CT occurring
in NE (NEE)

Legend

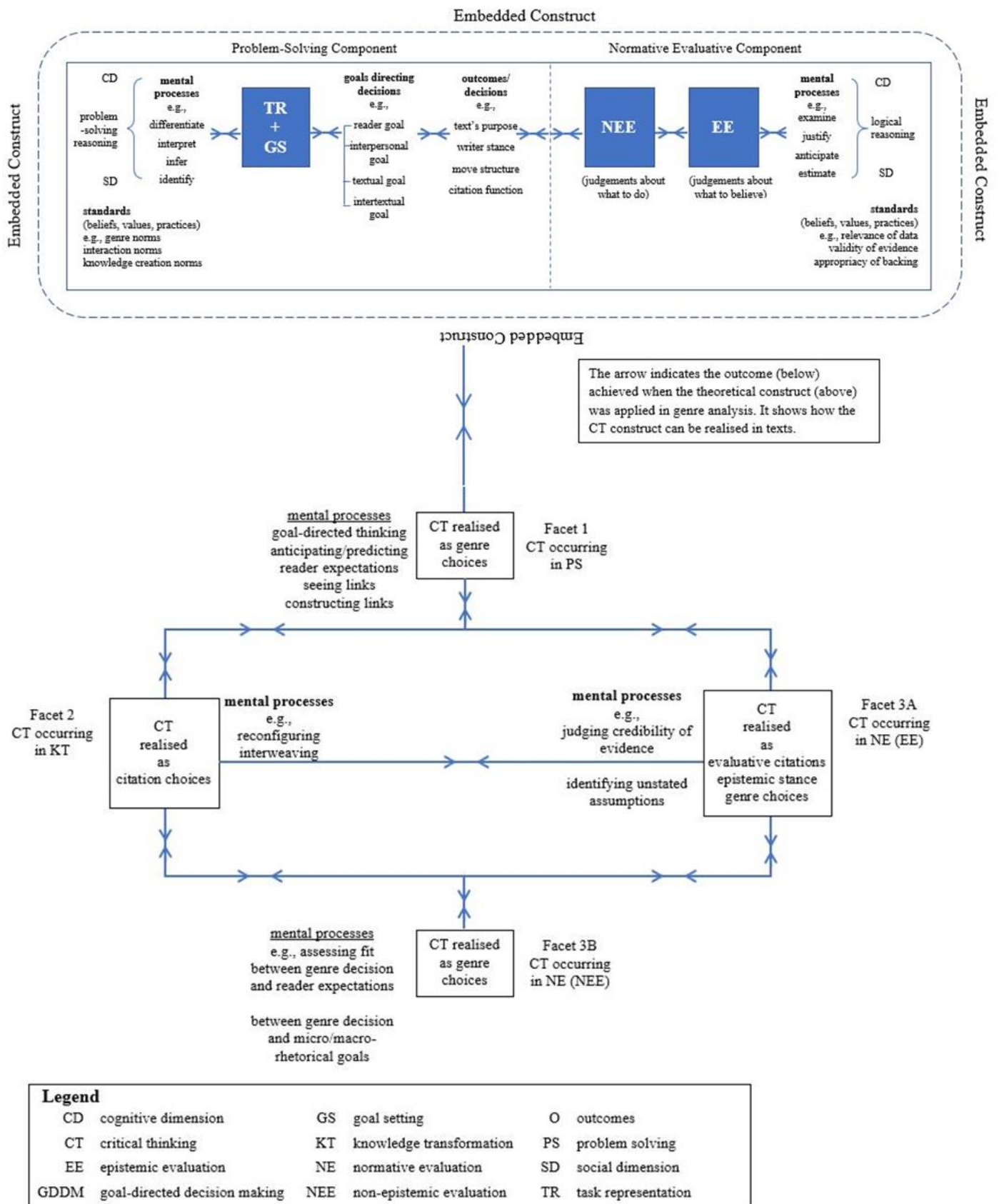|					
CD	cognitive dimension	GS	goal setting	O	outcomes
CT	critical thinking	KT	knowledge transformation	PS	problem solving
EE	epistemic evaluation	NE	normative evaluation	SD	social dimension
GDDM	goal-directed decision making	NEE	non-epistemic evaluation	TR	task representation

Figure 8.1. The facets, mental processes and instantiations of CT in a constructed text.

Section 8.2 will present some of the types of knowledge required to enable the operation of CT in academic writing. Section 8.3 will use the understanding of the instantiations of CT and how they differentiate the rhetorical quality of texts nominated successful (EX) from those nominated less successful (NE) in their display of CT to reinterpret the existing terminological and conceptual maze of CT terms and interpretations found in the academic writing literature discussed in Chapter 1. Section 8.4 will use the understanding of the nature and role of CT uncovered in this study to discuss its pedagogical implications, given the diverging views on whether CT can be taught and, if so, how (Atkinson,1997; McPeck,1981,1990; Moore, 2004).

8.1.1 CT processes in the problem-solving facet.

A fundamental realisation of CT in academic writing is in the instantiation of genre choices such as move, stance taking and citation choices among others (Table 8.1). This realisation is the outcome of CT occurring during the problem-solving process of text construction, involving social-cognitive problem-solving reasoning (Flower 1987, 1994; Flower & Hayes 1981) on the one hand and non-epistemic/epistemic normative evaluation involving social-cognitive informal logical reasoning (Hayes, 1981; Halpern, 1998; Kurfiss, 1988; Newell & Simon, 1983; Voss, Greene, et al., 1983) on the other (Figure 8.1). Both the problem-solving component and the non-epistemic/epistemic normative-evaluative component of the CT construct are involved in this facet of CT that is instantiated as genre choices (as discussed in Chapters 2 and 3). Cognitive (e.g., Galbraith, 1998) and genre theorists (e.g., Hyland, 2004a, 2004b; Tribble, 1996)) support the view that writing involves several instances of extensive decision making and is a social-cognitive act involving agency and choice, in which writers can decide on resources to choose to solve their writing problem and where choices are shaped by social considerations of the disciplinary context in which discourse is constructed.

The role of CT during the writing process is to guide problem-solving decision making and non-epistemic/epistemic normative evaluation so as to create outcomes such as move sequences, ST positions and citations that link the writer's work and the literature, to accomplish the writer's argument goal in a manner that is socioculturally appropriate and rhetorically effective to the context of writing. If CT was not playing its role during the writing process, the outcome would likely be as those that showed up in the findings chapter where the rhetorical purpose of the genre choices was not achieved because genre choices were rhetorically ineffective. The remaining paragraphs in this section will explicate the thinking processes inferred in the findings chapters to have been in operation during the problem solving

of genre choices and illustrate the consequences that resulted when these processes appeared to be inactive or supressed during decision making.

In the initial stage of solving problems relating to the selection of genre choices such as what move to make to construct the schematic structure, whether to use citations to display or to evaluate the literature or whether to use ST devices to persuade through intrusion, collusion, assertion or deference, CT had been inferred to involve the CT process of selecting (Gubbins, 1985) relevant information from the sociocultural context to construct the rhetorical-problem task (Flower & Hayes, 1981). This CT process is extrapolated to work in tandem with other CT processes such as distinguishing relevant from irrelevant information (Beyer, 1995; Sternberg, 1986)

To distinguish relevant from irrelevant information would have involved drawing on genre knowledge (e.g., Hyland, 2004b; Petric, 2007; Swales, 1990; Tardy, 2011) related to the conventions relevant to the genre feature in question for the introduction subgenre, to construct a problem/task representation that would enable the writer to solve the genre problem. The CT process of interpreting (Beyer, 1995; Facione et al., 1990; Raths, et al., 1996) the demands of the sociocultural context would also have been involved in differentiating and selecting relevant information. To specifically solve the genre problem of which move to make to construct a schematic-argument structure that would fulfil the writer's rhetorical-argument goal or communicative purpose (i.e., to justify the need for the writer's proposed study or to claim its significance), genre knowledge would include information such as the functions (create a research territory, expose the research gap(s) and occupy the gap(s) using moves conventionally labelled M1, M2, M3) of the three basic moves (Bunton, 2002; Kwan, 2006; Swales, 1990), the schematic structure to be constructed by the moves, the rhetorical goal to be achieved (to argue for the significance of the writer's study) and possibly knowledge of some of the possible permutations of the moves that could achieve the target structure and argument goal. The interview data reported in Chapter 5 indicated that both EX1A and EX1B used genre knowledge on move and move structure to direct the construction of their schematic structure (e.g., using the CARS model as a guide to construct the schematic structure of the introductions subgenre).

The task/problem representation for solving problems such as how to use citations to situate the writer's arguments, or to show the relationship between the writer's work and existing work, or to distinguish the writer's work from existing work, would have included interpreting

and selecting different information from the sociocultural context using relevant genre knowledge. For the construction of the problem representation of citations, the knowledge would have included the discourse community's expectations such as the purpose of citations (to create a contextual framework using community-generated literature to situate arguments or new work) in argument construction (Hyland, 2004a), the possible functions that citations can perform to construct new claims or arguments (Petric, 2007) as well as the argument structure and rhetorical functions of moves in which citations are used to achieve the argument goal of the introduction subgenre. The interview data reported in Chapter 6 also indicated that both EX1A and EX1B applied knowledge of the expectation of their discourse community to determine how they would use citations purposefully to construct the argument of their introduction chapter (e.g., to select citations for the purpose of building knowledge such as definitions of concepts for readers such as sociolinguists who do not have an in-depth understanding of the writer's topic).

Genre knowledge required to create the problem task to solve problems related to ST strategies would have included interpreting, differentiating and selecting information such as the various persuasive strategies of ST devices in a discipline that could enable the writer to advance claims or arguments by engaging "the established, knowledgeable and sceptical members of the disciplinary community" (Hyland, 2002, p. 531) in a manner the readers would expect. The finding showed that knowledge of the argument structure and rhetorical functions of moves would also have been be required to apply ST devices effectively to persuade the reader and to advance the argument goal of the introduction. This knowledge would be required for the construction of a task/problem representation to solve ST problems such as how to advance the writer's argument in a manner that facilitates a writer-reader relationship that favours the acceptance of the writer's argument, i.e., to advance claims by engaging the reader of the disciplinary community in a way that readers are likely to find "both credible an persuasive" by drawing on familiar ways of expressing arguments (Hyland,2001, p. 549). The interview data reported in Chapter 7 also indicated that both EX1A and EX1B selected ST devices based on an assessment of their claims and their audience (e.g., using attitude markers such as "increasing," "growing," "great" to advance the importance of a claim on a topic that was commonly known to be of interest to the readers of the discipline).

It was inferred in Chapters 5, 6 and 7 that at the point of processing and executing a genre decision during text construction, other CT processes such as anticipating or predicting the reader's expectations (social goals; Raths et al., 1986) and applying macro and local rhetorical

goals (goal-directed thinking; Flower & Hayes, 1981; Halpern, 1998) would facilitate the CT process of selecting the appropriate genre choice from alternatives (Gubbins, 1985).

For example, in the selection of move choices, the writer would select and execute move M1 rather than M2 or M3 if their local move-argument goal was to establish their study's research territory that would contribute to the macro-argument goal of the chapter to argue for the significance of their study. The findings and discussion in Chapter 5 suggest that apart from considering the social expectations that shape rhetorical-argument goals, which in turn direct the reasoning behind move decisions, successful move selection and execution also required the writer to infer logical relations or see links between various categories (Sternberg, 1986) and to interrelate categories or construct new links (Beyer, 1985).

The need to engage in CT processes that enable the writer to see and construct links in decision making was particularly evident in several instances of move choices found in NE texts where move choices made were less rhetorically effective in fulfilling the local and macro-argument goals of the text concerned. It was found in Section 5.2.2 that though a writer could execute a move to expose a research gap and fulfil the text's local argument goal, their move selection did not necessarily contribute to the macro-argument goal of the text because the gap created had no bearing on the research topic of the writer's study. In this case, the CT process of seeing and constructing links between the topic of the gap indicated in the move and topic of the writer's study was either suppressed or underengaged by the writer. In other cases where a suppression or inactivity of these CT processes was inferred, texts displayed a lack of cohesion in the schematic structure of the text constructed. In these instances, the relationship between the topics of subsections and the topics of moves within them on the one hand, and the topics of the subsections and moves across large stretches of the texts on the other, was not considered in the decision making of moves. The lack of consideration of these interrelationships during goal-directed decision making naturally resulted in moves that may have only fulfilled a local argument goal but which definitely did not contribute to the construction of the text's macro-argument goal. The findings and discussion in Chapter 5 strongly suggest that the construction of a cohesive argument structure would require a sustained inference and construction of logical links between their local and macro-goal within and across subsections of a text (Galbraith & Trent, 2009).

Moving to the selection and use of citation functions, when writers decide to select one citation function over the others similar CT processes were inferred to have played a role. If, for

instance, writers decide to use citations attributively rather than in other more complex ways such as application or evaluation, their decision would have been directed by a citation or intertextual rhetorical goal shaped by the social goal that their readers expected them to display: a good understanding of knowledge of the literature related to their research topic. The findings and discussion in Chapter 6 strongly suggest that apart from fulfilling the intertextual/citation rhetorical goal of fulfilling the reader's expectations, the writer had to ensure that the citation function selected also achieved the text's local and macro-rhetorical-argument goal since citations contribute to constructing the local and macro-rhetorical argument of the texts in question. To achieve this, the CT processes of inferring and constructing logical links between the two sets of goals were necessary. The data in Chapter 6 (Section 6.2.1) showed that when this CT process was underengaged or suppressed, resulting in an inadequate assessment of logical links between categories (e.g., between citation and research proposed), the citations selected did not build the knowledge base for the research proposed by the writer. The data also showed that if the selection of citations was not directed by the text's rhetorical-argument goal (arguing for the need of the writer's proposed study), the information in the citations did not seem to have a purpose other than the display of knowledge. In such cases where knowledge does not contribute to the writer's argument goal, it is possible that the writer loses sight of the text's local and macro-argument goals during the management of the intertextual/citation goals in the text construction process.

Similar CT processes were inferred to have played a role in solving the problem of selecting and using ST strategies. The CT process of anticipating the reader's expectation for the writer to advance claims by managing the writer-reader interaction included anticipating the reader's potential beliefs and position on the claim being advanced. This social goal which shapes the interpersonal rhetorical goal directs the selection of the ST strategy whether to persuade through deference (use of hedging), assertion (use of boosting), collusion (use of attitude) or intrusion (self-mention). Apart from fulfilling the interpersonal rhetorical goal, the ST device selected had to also fulfil the text's local and macro-rhetorical-argument goal that the device was used to advance. As such, recognising and constructing links between the two sets of goals was, as in the case of citation decisions, also critical to facilitating the successful selection and use of the ST device. The data in Chapter 7 showed that underengagement or suppression of the CT process of recognising and seeing logical links between the text's rhetorical-argument goal and the interpersonal rhetorical goal of the ST device could result in an overuse of devices such as personal intrusion.

To round off, this section has named some CT processes that were inferred to have played a role in problem solving related to the selection and use of genre features such as moves, citations and ST devices during the construction of the introduction subgenre. Though the nature of CT reasoning in academic writing for each genre feature has been analysed separately as is the practice in the discipline, it is probably the case that thinking processes for each genre feature overlap with one another in real-time text construction. This makes decision making in text construction a highly complex thinking process involving CT. For instance, the writer during text construction has to simultaneously attend to the various social goals (different for each genre feature) that translate into the rhetorical goals, which direct decision making at the point of text construction, navigate the interaction of several goals (e.g., rhetorical-argument goals, intertextual/citation goals, interpersonal goals), as well as maintain a sustained awareness of the goals across sections of the chapter and the developing paragraphs as the text is being constructed.

It is not surprising then that a schematic structure that lacks cohesion has implications for the rhetorical effectiveness of other genre choices. If writers are unable to construct a rhetorically effective argument/schematic structure, it suggests that rhetorical-argument goal-directed thinking has been suppressed or is inactive. If this is the case, then writers who do not construct effective local and macro-argument goals would only make partially successful, if not unsuccessful, citation and ST decisions as was seen in many of the NE texts discussed in Chapters 5, 6 and 7. In one example, the findings in Chapter 7 reported on an unusually high use of personal intrusion in an NE text, which was attributed to its incohesive schematic structure with a large number of M3 moves. Other examples in Chapters 6 and 7 reported the partial rhetorical effectiveness of citations and ST devices that achieved their intertextual/citation or interpersonal goals but without achieving the local/macro-rhetorical-argument goal required to construct and advance the text's argument.

Some CT processes inferred in the problem-solving facet of CT in the construction of the introduction subgenre include interpreting, differentiating, selecting, anticipating or predicting, goal-directing, inferring logical relations between categories and constructing new links between categories.

The CT processes associated with non-epistemic and epistemic-evaluative components of problem solving will be discussed in the facet on CT in evaluation presented in Section 8.1.3.

8.1.2 CT processes in the knowledge-transformation facet.[19]

Another facet of CT in academic writing is realised in the instantiation of citation choices. This realisation of CT in citation choices is the outcome of what cognitive writing theorists (Bereiter & Scardamalia, 1987) refer to as the process of knowledge transformation. Knowledge transformation in this study has been identified as being operational specifically in genre choices such as citations that require knowledge from source texts to be transformed into new and novel uses to serve functions that contribute to the construction of the new text being created (Spivey, 1990). The inactive or suppressed operation of CT processes related to knowledge-transformation results is what is often referred to as knowledge telling or the retelling of what authors in the source texts state without much change and without a clear purpose for the use of the information in the new text other than to signal to the reader that the writer possesses the knowledge displayed (Bereiter & Scardamalia, 1987; Petric, 2007). In contrast to knowledge telling, knowledge transformation requires writers to establish novel associations among different sources and links between sources and the writer's own work (Petric, 2007; Spivey, 1990). The inactive or suppressed operation of some of the CT processes associated with knowledge transformation could result in citation decisions that lack rhetorical success. The findings and discussion in Chapters 5, 6 and 7 strongly suggest that CT in academic writing not only involves the mental processes required to solve genre problems (the facet of CT occurring in problem solving) but also those required to transform source information into new and novel uses in a new text. This facet of CT (Table 8.1) is labelled "CT occurring in knowledge transformation." The remaining paragraphs in this subsection will explicate the thinking processes inferred to be in operation during knowledge transformation and illustrate the consequences on the rhetorical effectiveness of citations selected when these processes are inactive or suppressed during text construction.

Knowledge transformation in text construction has been inferred to require the CT process of reconfiguration (Sternberg, 1986) to enable the writer to recast source knowledge in the text being constructed for a purpose different to that used in the original text. The findings and discussion in Chapter 6 (Sections 6.2.2 and 6.2.3) provided several instances of how writers used source information to serve various purposes in their local and macro-rhetorical arguments. EX writers successfully recast citations to serve evaluative and application

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[19] I have separated general problem solving (Flower, 1987, 1994; Flower & Hayes, 1981) from problem solving associated with knowledge transformation (Scardamalia & Bereiter, 1987) based on the CT processes associated with their instantiations in the constructed text as inferred through text analysis and selected interview data.

functions such as evaluating source information negatively to legitimise the writer's proposed research or recasting citations to serve as supporting evidence to advance the writer's claim. NE writers also displayed attempts at recasting source information such as evaluating sources in a positive light to justify the choice of the writer's research method or recasting source information to show how a method in the literature is suitable for achieving the writer's research aim.

The data showed that there were several instances in NE texts where the writer's efforts at transformation lacked rhetorical success. This was inferred to be due to the suppression or inactivity of the complementary CT process of interweaving citations (Bailin et al., 1999b; Beyer, 1995) to fit the developing text by making new connections between citations and between citations and the new text (Spivey, 1990). The successful interweaving of citations included seeing links between them (e.g., grouping various sources to serve a common purpose such as providing support or exposing deficiencies) and between the citations and the source text (e.g., fitting the citations into the developing argument to achieve the macro-argument of the text). EX texts mentioned in the previous paragraph exhibited successful interweaving of citations. NE texts, however, exhibited less successful interweaving, stopping short at showing how various groups of citations link to each other to achieve an argument goal or to show how a justified method relates to the writer's own approach. An extreme case of a lack of transformation in the use of citations was observed in an NE text where source information was stacked one after another without any clear purpose or relationship to the macro-rhetorical-argument goal of the text.

Problem solving in the selection and use of citations is a complex process that not only involves general problem-solving processes but also CT processes for knowledge transformation needed to consider how information from source texts can be reconfigured and interwoven to construct the argument for the new text being constructed. It is also highly probable that the two facets of CT, and their processes related to the selection and use of citations, intersect and interrelate during the text construction process. The comments below from the writer of EX1A provide a glimpse of the complexity of factors they had to navigate during the process of transforming source information to fit their argument. In reconfiguring source information to function evaluatively, they also consider several factors, which the writer terms "local conditions," to interweave the source into the developing argument.

Interviewee (text EX1A): At a later time when I need to reveal gaps in existing literature, I cite significant details from selected studies to help me make my point. The source wording, the grammatical context of my developing text, the argument step that needs to be expressed at a certain point in the writing process are "local" conditions that affect my source use.

8.1.3 CT processes in the normative-evaluation facet of CT.

The third facet of CT in academic writing is normative evaluation (Bailin et al., 1999a; Beyer, 1995; Black, 2008; Facione, 1984; Facione et al., 1990; Gubbins, 1985), which can be further divided into two subfacets according to the CT processes that comprise them. The two subfacets are epistemic evaluation and non-epistemic evaluation.

Normative-epistemic evaluation has to do with the normative assessment of truth assertions made in claims in order to make judgements about the validity of assertions (i.e., what to believe) according to acceptable socially situated norms (described in detail in Chapter 2, Section 2.2). This form of evaluation is termed epistemic because it assesses the epistemic adequacy of claims (Burbules & Berk, 1999). It involves logical reasoning that recognises faulty arguments, hasty generalisations, assertions lacking evidence, truth claims based on unreliable authority, ambiguous or obscure concepts and the like. The CT processes typically associated with evaluation are identifying components of arguments, judging credibility of evidence, identifying unstated assumptions, detecting bias, identifying logical fallacies, recognising logical inconsistencies in a line of reasoning, among others, based on standards of good logical thinking in a discipline (Beyer, 1995; Ennis, 1987).

Normative-epistemic evaluation in academic writing is instantiated in at least three different ways to serve different functions. In epistemic ST devices (hedges and boosters as opposed to other ST devices), it functions to signal the writer's assessment of argument claims through the use of language (e.g., may, might, could, perhaps, strongly, clearly, undeniably) that communicate the writer's level of commitment to a claim. In the evaluative use of citations as opposed to the other uses of citations, writers signal their evaluation of arguments in cited sources though the use of explicit evaluative language (e.g., inadequate, lacks consistency, invalid). This evaluation, which is typically negative in direction, serves to expose gaps in the literature through the counterclaiming move and is used to justify a need for the proposed research in the area exposed. The evaluative use of citations in this study also includes the use of citations by writers to evaluate other citations (Petric, 2007). A third realisation of

normative-epistemic evaluation is in genre choices. This evaluation serves to assess decisions that assume the solutions or conclusions (i.e., the genre choice selected) reached through the problem-solving process during text construction are effective (Hayes, 1981; Halpern, 1998; Kurfiss, 1988; Newell & Simon, 1983; Voss, Greene, et al., 1983). Each of the subfacets of CT in evaluation work in tandem with other CT processes. The consequence of a lack of engagement with other CT processes results in written outcomes that are rhetorically ineffective. The following paragraphs will explicate the CT processes that work with normative-epistemic evaluation and provide examples of outcomes that result from a lack of engagement with other necessary CT processes.

The evaluation of arguments using sources is expressed overtly through evaluative language in the counterclaiming move. For evaluation to achieve its rhetorical purpose of exposing a gap to justify the need for a proposed study, it has to work in tandem with other problem-solving CT processes such as micro-/macro-argument goal-directed thinking (Flower & Hayes, 1981; Halpern, 1998), which ensure that the topic evaluated is relevant to the topic of the writer's research topic, where the CT processes of seeing and constructing links between categories would enable writers to see the link between the text's micro-/macro-rhetorical-argument goal and the topic evaluated using a source. The findings and discussion in Chapters 5 and 6 showed that when CT processes such seeing and constructing links between categories were suppressed or inactive, and not working in tandem with the CT process of normative evaluation, the result was a lack of relevance between the evaluated topic and the writer's research or a lack of relevance among a sequence of evaluative citations required to create a research gap.

The CT skills that operate in the process of evaluation realised in epistemic stance are similar to those that operate in evaluative citations. The realisation of evaluation in epistemic stance is communicated through language that conveys deference or assertion signalling a writer's commitment to the claim they have evaluated. Similar to the operation of evaluation in evaluative citations, evaluation in epistemic stance works in tandem with other problem-solving CT processes such as micro-/macro-argument goal-directed thinking (Flower & Hayes, 1981; Halpern, 1998) to ensure the ST strategy contributes to advancing the micro-/macro-rhetorical argument of the research proposed by the writer, where the CT processes of seeing and constructing links between categories would enable writers to see the link between the text's micro-/macro-rhetorical argument goal and the interpersonal goal of the epistemic-stance device selected. It was found in Chapter 7 that if evaluation was not working in tandem with

goal direction, and seeing and constructing links between categories, the epistemic ST devices did not successfully advance the rhetorical argument they are expected to.

Finally, epistemic evaluation that is realised in genre choices works not only in tandem with the processes of problem solving but also with the processes of non-epistemic evaluation, the second subfacet of normative evaluation. Non-epistemic evaluation involves judgements about the effectiveness of solutions (genre choices) that result from an assessment of the social-cognitive problem-solving reasoning that led to the solutions (Halpern, 1998; Kurfiss, 1988). In order for genre choices resulting from problem solving to be defended and justified through epistemic evaluation or social-cognitive logical reasoning, the problem-solving reasoning that led to the choices needs to be first evaluated. The evaluation of problem-solving reasoning is non-epistemic in nature and is synonymous with the final step of the problem-solving process (Hayes, 1981; Voss Greene, et al., 1983). It allows writers to make judgements about the effectiveness of the solutions to problems.

Flower and Hayes's (1981) research reported in Chapter 3 (Section 3.2.2) suggests that successful writers review their writing by focusing on achieving the rhetorical demands of their texts. It follows then that when decisions are not evaluated, texts are most likely to display rhetorically ineffective solutions (genre choices). The findings in Chapters 5, 6 and 7 show several instances of such choices. Some examples include moves, citations and ST devices not contributing to the text's macro-argument goal; unhedged claims; an overuse of personal intrusion; a lack of connection between groups of citations that serve a purpose; or a lack of connection between citations used to support a writer's approach and the writer's actual approach, among others. The CT process of non-epistemic evaluation includes examining genre decisions to assess the appropriacy of the fit between the decision and the micro-/macro-rhetorical-argument goal, the genre decision and reader expectations, between the rhetorical-argument goal and interpersonal or intertextual (citation) goal, between citations serving a common purpose, between the purpose of citations and the writer's actual intention, and the fit between decisions within and across subsections of a text.

Non-epistemic and epistemic evaluation in genre choices operate in tandem during problem solving to help writers differentiate between reasoning that is "superficial, careless, rash and naïve" (Bailin et al., 1999a, p. 290) from disciplined and well-thought-through reasoning that is reached about what to do or believe, based on "relevant rather than irrelevant data, credible rather non-credible sources" and "on the basis of appropriate evidence" (p. 290). It also allows

critical thinkers to increase the probability of a desirable outcome (Halpern, 1998) because CT involves "evaluating the reasoning that went into the conclusion arrived at or the kinds of factors considered in decision making" (p. 451) during problem solving.

While normative-evaluative epistemic evaluation occurs in some instances of genre choices, such as evaluative citations and epistemic stance, to serve different purposes, it is inseparable from non-epistemic normative evaluation facilitating the evaluation and defence of all solutions to writing problems. It is this aspect of CT that is critical to enabling successful writers to differentiate the rhetorical quality of genre choices they make in their texts. The processes associated with the facet of normative-epistemic evaluation are identifying components of arguments, judging credibility of evidence, identifying unstated assumptions, detecting bias, identifying logical fallacies, recognising logical inconsistencies in a line of reasoning, among others, based on standards of good logical thinking in a discipline. The process associated with the facet of non-epistemic normative evaluation is assessing the fit between categories such as genre decisions and the text's micro-/macro-rhetorical-argument goal, between genre decisions and reader expectations, between rhetorical-argument goal and interpersonal or intertextual (citation) goal, between citations serving a common purpose, between the purpose of citations and the writer's actual intention, and the fit among decisions within and across subsections of texts.

8.1.4 A summary of the integrated model on the nature and role of CT in academic writing.

The construct of CT argued for and represented in the integrated model of CT in this study (Figure 8.1, Table 8.1) comprises the two core elements of problem solving and normative evaluation. CT that is engaged in the reasoning required to solve problems during text construction is both social and cognitive in nature. This is because considerations of conventions and norms from the sociocultural disciplinary context shape the decision- making process, which involves several problem-solving steps (e.g., representation of the task, execution of the solution, evaluation comprising the assessment of the solution achieved) explained in Chapter 3 (Section 3.2) and mental processes (e.g., applying genre knowledge, differentiating, selecting, setting goals, goal-directed thinking, anticipating). The label I have accorded this form of CT reasoning is social-cognitive problem-solving reasoning. This reasoning is instantiated in all genre choices that are the outcomes or solutions of the problem-solving process.

I have also argued that the last step in the problem-solving process is normative evaluation which involves both non-epistemic and epistemic evaluation. This form of evaluation involves social-cognitive evaluation of the problem-solving reasoning that resulted in the outcomes of problem solving as well as logical reasoning that assesses the claim that defends the efficacy of solutions reached.

Non-epistemic evaluation involves assessing the decision reached through the problem-solving process and includes mental processes such as seeing and constructing links between categories and assessing their fit or congruence (e.g., between the genre decision and the micro-/macro-rhetorical goal, between genre decision and reader expectation, among rhetorical-argument goal, interpersonal goal and citation/intertextual goal). It allows the writer to make judgements about what to do (in this case the what the best solution to the genre problem might be). Epistemic evaluation on the other hand involves social-cognitive logical reasoning that evaluates the validity of the claim about a genre decision being the most efficacious. It allows writers to make judgements about what to believe (i.e., the assertion that a particular genre choice is the best solution). Some examples of processes involved in epistemic evaluation are judging credibility of evidence, identifying unstated assumptions and recognising logical inconsistencies in a line of reasoning.

Social-cognitive problem-solving and logical reasoning are the core components of CT in academic writing because their role is to distinguish critical from less critical reasoning, which accounts for genre choices that impact the rhetorical quality of written texts. Specifically, in academic writing, CT plays the role of guiding the writer to make socioculturally appropriate and rhetorically effective genre choices that facilitate the construction of texts that achieve social purposes in specific disciplinary contexts. The underengagement or suppression of CT processes has consequences such as schematic structures that lack cohesion, moves that do not achieve their purpose (e.g., to display a gap that validates the writer's study), citations that retell information without signalling a clear purpose and texts that are underhedged or which display an unusually high occurrence of personal intrusion.

My study has shown that apart from the instantiation of the CT processes in the core elements of CT in all genre choices, other CT processes could be in operation in text construction. For instance, my study has identified that in addition to the basic problem-solving processes, CT as knowledge transformation is instantiated in the use of complex citations. The additional mental processes involved in knowledge transformation include reconfiguring the cited source

and interweaving it to fit the developing argument of the text it is used in. Though problem solving (Flower & Hayes, 1981) and knowledge transformation (Bereiter & Scardamalia, 1987) have been used in the literature to allude to CT (Richards, 2000), they have not been explicitly differentiated in terms of the CT processes that constitute them. My study has differentiated problem solving and knowledge transformation into two separate but interrelated facets of CT constituting their own set of thinking processes (Table 8.1).

Finally, my study has also purported that epistemic-normative evaluation (with its component thinking processes), which functions to validate genre choices, also functions to evaluate literature to expose defects as in its use in evaluative citations in the counterclaiming move and to evaluate literature to enable the writer to signal their level of commitment to claims in the instantiation of epistemic stance. The operation of CT processes in these instantiations of normative-epistemic evaluation interrelates with problem-solving processes and epistemic and non-epistemic evaluation of the genre choice in question.

To conclude, in presenting the integrated model on the nature and role of CT in academic writing, my study has tried to capture the complexity of CT in academic writing by showing how the interrelated CT processes associated with all genre choices, complex use of citations, epistemic ST devices and evaluative citations, can be differentiated into various facets of CT, as a starting point in the understanding of the notion of CT in academic writing. As such, the complex construct of CT has been purported to comprise the strands of CT in problem solving, CT in knowledge transformation and CT in the interrelated epistemic and non-epistemic normative evaluation, which are realised in genre choices, complex citations, epistemic stance and evaluative citations in the constructed text.

8.2 Knowledge Facilitating the Exercise of CT

The aim of this section is to present some of the types of knowledge required to enable the operation of CT in academic writing. Claims about this knowledge are extrapolated from the results and discussion of the text analysis presented in Chapters 5, 6 and 7 that contributed to the identification of the facets of the CT construct.

The categories of knowledge extrapolated from the analysis and subsequent discussion of CT in texts in the three findings and discussion chapters are presented in Table 8.2. The categories of knowledge include how problems are solved, how information is transformed, how arguments are analysed, and how the solutions to problems are assessed for effectiveness, genre knowledge and a sufficient level of disciplinary content knowledge of the field of study. The

discussion of CT in the findings and discussion chapters suggests that writers need to be able to perform a set of mental acts related to problem solving, knowledge transformation, argument analysis (for normative-epistemic evaluation), assessment of the effectiveness of solutions to problems solved (for non-epistemic evaluation), using knowledge of the target genre as well as, where required, disciplinary content knowledge (related to, in the case of the present study, the writer's area or topic of research), to be able to construct successful texts.

Table 8.2

Some Categories of Knowledge Required for Engaging in CT in Academic Writing

Category of knowledge to operate in CT	Some examples of knowledge in terms of mental acts writers need to perform
	[what the writer needs to know to be able to operate in CT during text construction]
how to solve problems (problem-solving heuristics) (Flower & Hayes, 1981)	being able to:
	construct an accurate task representation of a problem (e.g., for an argument-construction task, a social-interaction task, for a task on situating a study and showing links to the existing body of knowledge)
	recognise and anticipate what readers expect in terms of need for information, need for justification of proposed research, need for the consideration of their questions/scepticism/resistance/positions/beliefs)
	construct rhetorical goals from social goals
	direct decision making through appropriate rhetorical goals
	recognise and consider links between various categories required for decision making (e.g., links between rhetorical goals at paragraph level, section level and across the text; between rhetorical and interpersonal goals, etc).
	select strategies for addressing different types of problems
how to transform source information (Spivey, 1990)	being able to:
	recast information to serve a new purpose
	recognise novel associations between sources and between sources and writer's own work to
	interweave source information into a text's developing argument
how to analyse arguments (argument analysis) (Shepelak, Curry-Jackson & Moore, 1992; Toulmin, 1958/2003; Toulmin et al., 1984)	being able to:
	identify the components of an argument
	assess the validity/quality of evidence used in relation to what is considered appropriate in a discipline

	identify assumptions or warrants that support the link between evidence and claims
	identify constraints within which warrants are valid
	assess appropriacy of methods used in arriving at claims
how to evaluate solutions to problems (and be able to defend them) (Hayes, 1981)	being able to: assess fit between genre decisions and the text's micro-/macro-rhetorical-argument goal assess fit between genre decisions and reader expectations assess fit between rhetorical-argument goal and interpersonal or intertextual (citation) goal assess fit between citations serving a common purpose assess fit between the purpose of citations and the writer's actual intention assess fit among decisions within and across subsections of texts
knowledge of genre (specific to the discipline in which writing takes place)	social conventions and expectations such as: knowledge of structure, communicative purpose, move functions, possible permutations of moves of introductions subgenre practices in the discipline (Bhatia, 1993; Bunton 2002; Swales, 1990) knowledge of persuasive strategies to maintain interpersonal relations in advancing claims and options of ST devices that can be used (Hyland, 2005b, 2008) knowledge of valued ways of advancing or extending new knowledge claims by situating them in the existing body of literature (sources of information) and drawing links between them (source texts) (Hyland, 1999 or 2004a; Petric 2007)
adequate level of content/disciplinary knowledge related to research topic (Macken-Horarik, 1996, Mathison, 1996)	content knowledge such as: main theorists and arguments related to a topic in a field main controversies and issues of interest related to a topic in the field main research methods or modes of inquiry in the field of research (socially determined assumptions about validity shared by the community of researchers) (Bailin et al., 1999a)

The consequences of the suppressed or absent performance of one or more of the mental acts listed in Table 8.2, which are associated with the CT processes listed in Table 8.1, were clearly evident in the writing quality of texts analysed in this study. Some of the consequences observed (as mentioned earlier) included several NE texts not reflecting the expected genre

structure of the introduction subgenre, citations not successfully performing the functions the writers intended for them and ST devices not contributing to the macro-argument goal of the text, which they were supposed to advance in order to gain the reader's acceptance.

It was found in Chapter 5 that several NE writers did not seem able to recognise and consider links between various categories required for decision making during problem solving. This involved recognising links such as those between the topic of the move enacted and the topic of the research (e.g., the gap exposed was not about the topic of the research), between the rhetorical goal of the subsection and the micro-/local goal of the move (e.g., exposing a gap in a subsection signalling the provision of information about the writer's proposed research) and between the rhetorical goals of subsections (e.g., placing the research territory at the end of the chapter after locating the study).

Chapter 6 reported several instances of NE texts that were only partially able to transform source information, reflecting an inability to reorganise/interweave information to achieve the text's rhetorical argument. Examples included not recognising links between sources (e.g., not linking the various groups of citations selected by the writer to achieve the text's argument goal) and not linking the purpose of citations to the writer's intention (e.g., citations selected to defend the writer's approach not matching the approach actually used by the writer). In other instances, the writer was not able to successfully recast the selected source information to serve a new purpose because the information selected for a new use in the writer's text (e.g., to expose a gap) had no bearing on the rhetorical argument of the text it was expected to construct. Reorganising/interweaving and recasting information are critical for transforming source information for a new use that contributes to the developing argument of the new text.

Chapter 7 reported instances of very low use of epistemic ST devices (hedges and boosters) in NE texts, suggesting that the writers were for some reason not engaging actively in the CT mental acts associated with epistemic evaluation in this instantiation. It was suggested in Chapter 7 that this could be due to the writers' apprehension of evaluating the work of academics in the field (Belcher, 1995) and having the option of using other ST devices that did not require evaluation as a persuasive strategy. In contrast to this instantiation, NE writers engaged actively in epistemic evaluation associated with using citations evaluatively to expose a gap in the literature. The effectiveness of the use of epistemic evaluation was, however, limited in these instances as reported in Chapters 5 and 6 because writers did not seem to be able to simultaneously engage in other mental acts related to problem solving, which were

required for the enactment of epistemic evaluation (e.g., evaluation associated with exposing a gap in the literature may not be relevant to the writer's study if the writer does not engage in problem-solving acts such as recognising the link between what is evaluated and the topic of their research).

The several instances of ineffective genre choices reported in the previous paragraphs also suggest that writers not only lacked the awareness of mental acts required for solving problems, transforming knowledge and evaluating truth claims but also the awareness of how to evaluate solutions for their effectiveness, since both sets of mental acts (for problem solving and for evaluation) are interrelated (argued in Section 2.4).

Possessing knowledge of the "how to" which is referred to by cognitive scientists as procedural knowledge (Bransford et al., 1986; Perfetto et al., 1983; Simon, 1980) is fundamental to problem solving but would not be adequate without genre knowledge. It would not be possible for students to create a task representation of a problem without an understanding of the sociocultural expectations of the members of the discourse community in which they are writing (e.g., the norms of persuasion which require reader-writer [interpersonal] interaction to be maintained, norms such as exposing gaps to advance knowledge, and creating a shared understanding of knowledge within which to advance claims). Also, an adequate level of disciplinary knowledge is necessary for writers to be able to critique literature and to communicate their commitment or positions about truth claims. Without an understanding of basic concepts, key controversies, arguments of prominent scholars, and methods of inquiry (e.g., to assess the adequacy of evidence according to the norms of a discipline) within the field in which a topic is researched, it would be difficult for writers to make an informed judgement about truth claims (Macken-Horarik, 1996, Mathison, 1996).

The lack of engagement in CT, resulting in rhetorically ineffective instances of genre choices in the NE texts cited above, is not unexpected if it is recognised that the nature of knowledge required for novice writers to operate in CT is tacit, inexplicit and embedded in the sociocultural context of writing within a discipline (Atkinson, 1997; Greeno, 1980; Hawkins, 1998; Kurfiss, 1988). It is knowledge that exists as shared knowledge among members of a discipline but is not understood by "outsiders" (Berkenkotter et al., 1988; Casanave & Li, 2008; Porter, 1986) which explains why newcomers to a discipline find it difficult to engage and participate in the conversations of the discipline they are attempting to write in and why they often feel like a "fish out of water" because they "did not know how to write and think

according to disciplinary expectations" (Casanave & Li, 2008, p. 15). It is also a common understanding among writing researchers that newcomers to a discipline find it difficult to "crack the secret code" of the privileged genres or discourses that can be a "mystifying labyrinth" to them (Belcher & Braine, 1995, p. xv). The theoretical discussion of the knowledge required for CT in Chapter 3 (Section 3.6) pointed out that though some of the CT knowledge required for solving a writing problem can be said to be explicit or generic such as the general problem-solving steps/heuristics and argument-analysis skills, most knowledge required is "implicit, tacit, taken-for-granted thought processes that an expert uses without conscious attention" (Kurfiss, 1998, p. 40).

Section 8.5 will discuss the pedagogical implications of the tacit, inexplicit and embedded nature of CT on the acquisition of knowledge required for operating in CT to construct texts.

8.3 Revisiting the Literature on CT

The objective of this section is to use the CT model developed from my interpretation of the findings, to throw light on the descriptions of CT in the existing state of the literature, so as to understand those descriptions in a new and more informative light. The CT facets and their processes listed in Table 8.1 will be used to interpret the meanings of CT implied in the various labels used in the existing literature.

A common interpretation of CT in existing literature is associated with the CT facet of normative-epistemic evaluation. It is an interpretation found in assessment guidelines that refers to "the ability to exercise critical and analytical judgement of the literature" (extracted from the assessment guidelines for PhD students cited in Chapter 1). Woodward-Kron (2002) uses the label of "critique" or "critical evaluation" for CT and describes it as "critiquing established knowledge, developing an argument supported by evidence and evaluating phenomenon according to selected criteria" (pp. 122–123). Other descriptions of this facet include a "complex weighing of evidence and analysis of theoretical perspective" (Smith et al., 1999, p. 331); "assess[ing] and weigh[ing] up the value and importance of claims" and "identifying arguments for and against theories, ideas, claims that were published" (Bitchener & Banda, 2007, p. 66); "assessing or weighing up the value of theories, ideas, claims, research designs, methods or conclusions" (Bitchener, 2010, p. 61); "mak[ing] assessment of previous work" (Mullins & Kiley, 2002, p. 380) and "critically apprais[ing] the literature" (Holbrook et al., 2007). These descriptions of analytical judgement can be associated with the CT processes identified in Table 8.1 as judging the credibility of evidence, identifying unstated assumptions,

detecting bias, among others. In my study, it was found to be realised in evaluative language where citations are used evaluatively to expose a research gap in existing literature through counterclaiming in move M2. The "complex weighing of evidence," for instance is a process required to realise the gap-creation move where the writer weighs evidence from previous research to identify limitations to be used to justify the need for their proposed research. Apart from the realisation of epistemic evaluation in gap creation, this form of evaluation can also be realised in commentaries of the literature, which Ridley (2008) refers to as the same processes that would be involved in making analytical judgements about claims that lead to the evaluative comments.

Further related interpretations of CT in the literature, associated with realisation of CT as epistemic-normative evaluation, are "evaluative judgements made within any field of human activity about some aspect, object or behaviour of that field" (I. Bruce, 2014 p. 91) and "a statement which reflects a discrepancy between the stance of a researcher/author, on one side, and that of another researcher or the discourse community as a whole " (Cheng, 2006, p. 279).

I. Bruce (2014) uses this definition for the label "criticality" to refer to both ST devices and gap-indicating devices in moves. My model indicates that these definitions also belong to the facet of CT occurring in normative-epistemic evaluation, which is realised in gap-indicating evaluative language (e.g., inadequate, lacks consistency, invalid) as well as language signalling the writer's commitment to a claim (e.g., may, might, could, perhaps, strongly, clearly, undeniably). Writers are able to differentiate when to use normative-epistemic evaluation for each of the purposes through other problem-solving CT processes such as applying goal-directed thinking (e.g., rhetorical-argument goal, interpersonal goal) and anticipating or predicting the reader's expectations including their opposing views (e.g., the need to critique existing literature to justify the need for a new study, the need to take account of readers' biases, positions, beliefs), which act in tandem with epistemic evaluation processes. CT as problem solving and its associated thinking processes have been identified as a separate but interrelated strand of CT in academic writing.

Cheng (2006) uses the term "academic criticism" to refer to ST. Here, definition is in sync with Hyland's (2005b, 2008) definition of stance that I have used in the present study and includes the component processes of CT as epistemic-normative evaluation. The CT processes are those associated with judging and evaluating truth claims, anticipating reader scepticism or even challenge, arising from anticipation or recognition that there are alternative views and planning

a strategy to manage the potential responses (component processes of both the problem-solving and normative-evaluation facets as discussed in the previous paragraph).

A third set of CT interpretations is associated with the realisation of CT as knowledge transformation. It is the interpretation of CT used by Richards (2000). Richards's interpretation of CT as knowledge transformation is based on the problem-solving research of cognitive writing theorists such as Bereiter and Scardamalia (1987) and Flower and Hayes (1981). My study indicates that the though the mental processes associated with knowledge transformation interact with those associated with general problem solving, they are different processes and hence different facets of CT. The processes involved in Richards's interpretation of knowledge transformation hence would include the processes my study has identified for the transformation of source information. These processes include reconfiguring source information (e.g., working out the purpose a source text will serve in the new text, which is different from its purpose in the original text) and interweaving it to fit into a development argument (e.g., seeing and making connections between the source information and the new text). These processes would need to operate in tandem with the general problem-solving processes to achieve the rhetorical outcomes of the information that is transformed. The processes which would include applying goal-directed thinking and anticipating reader expectations would facilitate this. In transforming source information, for example, the source to select would be directed by general problem-solving goal-directed thinking, while the use of the source for a new purpose would require transformation processes such as reconfiguration and interweaving to fit the new purpose of the source text into the developing argument of the new text.

A final set of interpretations is associated with the labels "criticality," used by Pemberton and Nix (2012) and "critical consciousness" used by Flower et al. (1990). Pemberton and Nix (2012) use the term CT to refer to "cognitive skills" (p. 547) such as evaluation, which is used to assess the epistemic adequacy of arguments on the one hand and to examine power relations and social inequalities on the other. Their meaning of CT hence includes the facet of epistemic-normative evaluation discussed above as well as the evaluation of power relations. Flower et al.'s (1990) use of the term critical consciousness seems to include a blend that combines the meanings of CT as knowledge transformation, CT as normative-epistemic evaluation and CT as the evaluation of power relations and social inequities. CT, to them, refers to critical literacy that "questions assumptions" (p. 5) and goes beyond understanding information to transform it for a new use. Their definition suggests a non-receptive attitude toward knowledge in sources,

which aligns with the CT facet of normative evaluation (assessing truth claims) and CT as knowledge transformation (transforming source information for a new rhetorical purpose). The component of CT as evaluating power relations and social inequalities in Pemberton and Nix's (2012) and Flower et al.'s (1990) interpretation of CT does not exist in my model. The facet of CT as normative evaluation in my model does not extend to include processes for "questioning both authority and status quo" (Flower et al., 1990, p. 5) because my model and the research that informed it was driven by the objective to improve student writers' thinking in academic writing whereas the criticality of "political and social consciousness" (Burbules & Berk, 1999, p. 2) is aimed at improving sociopolitical structures and is hence beyond the purview of my research objective.

Table 8.3 shows how the various facets of CT uncovered in my study relate to terms and interpretations in existing literature.

Table 8.3

Interpreting Existing Literature Using Sociocognitive CT Model

Existing definitions of CT	Labels used for CT	Interpreting CT implied in labels for CT using CT model (Figure 8.1)	Some processes that support interpretation of existing literature (extracted from Table 8.1)
critiquing established literature (Woodward-Kron, 2002) assess, weigh up claims. (Bitchener & Banda, 2007) assessing, weighing up value of theories (Bitchener, 2010) critically appraise literature (Holbrook et al., 2007) assess previous work (Mullins & Kiley, 2002)	critique or critical evaluation	epistemic evaluation	judging credibility of evidence identifying unstated assumptions detecting bias
I Bruce (2014) evaluative judgements made within any field of human activity about some aspect, object or behaviour of that field	Criticality	epistemic evaluation	judging credibility of evidence identifying unstated assumptions detecting bias
Cheng (2006)	academic criticism	epistemic evaluation	judging credibility of evidence

			identifying unstated assumptions
a statement which reflects a discrepancy between the stance of a researcher/author, on one side, and that of another researcher or the discourse community as a whole			detecting bias
Richards (2000) problem solving	critical thinking	knowledge transformation	reconfiguring information for a new purpose interweaving information to fit into a developing argument
Pemberton & Nix (2012) "cognitive skills" such as evaluation, which is used to assess the epistemic adequacy of arguments on the one hand and to examine power relations and social inequalities on the other	Criticality	epistemic evaluation evaluation of power relations	judging credibility of evidence identifying unstated assumptions detecting bias
Flower et al. (1990) critical literacy that "questions assumptions" and goes beyond understanding information to transform it for a new use	critical consciousness	knowledge transformation evaluation of power relations	reconfiguring information for a new purpose interweaving information to fit into a developing argument
Ridley (2008) evaluative commentaries	critical writing	epistemic evaluation	judging credibility of evidence identifying unstated assumptions detecting bias

I have in this section attempted to clarify existing definitions of CT by using the CT model developed from text analysis in this study. This has to some extent enabled me to differentiate the meanings of CT in the existing literature by naming the possible set of processes that comprise them. In doing so, I have tried to attain greater explicitness for or understanding of the meaning of CT in academic writing.

The next section will discuss the pedagogical application of the understanding of CT developed in the present study.

8.4 Pedagogical Implications

The conclusions drawn from the findings and discussion chapters that contributed to the integrated model of CT discussed earlier will be used in this section to propose activities that can promote the acquisition of the knowledge required for engaging in CT processes to construct successful texts. The findings and discussion in this study strongly support the literature discussed in Chapter 2 that CT is situated (embedded) in and shaped by disciplinary and contextual knowledge, and that the CT processes and knowledge that are required for its operation in text construction are mostly tacit in nature. The findings repeatedly showed that genre knowledge and CT processes have to be tapped into for the operation of CT that produces successful writing. The flaws in move execution, use of citation and genre-appropriate stance in NE texts were largely attributed to the lack of the tacit knowledge required for operating in discipline-embedded CT.

The mostly tacit and embedded nature of the knowledge required for the operation of CT to construct texts has implications for how novice writers can acquire this knowledge and has also been the source of disagreement among scholars about whether CT can be taught.

Advocates who argue against the teaching of CT such as Atkinson (1997), McPeck (1981, 1990) and Moore (2004) contend that CT is not generalisable and that there is no need for explicit instruction since CT skills which are genre-specific and discipline-related are learned "through the pores" (Atkinson, 1997, p. 73) through social practice in a discipline or through the participation in the genre of a discipline. Atkinson (1997) further questions the usefulness and need to "teach" CT to learners of other cultures because it is an Anglophone mode of thinking, foreign to the models of thinking in other cultures.

The extent to which the knowledge and skills for CT required for academic writing are acquired "through the pores" is questionable given the numerous reports of the challenges novice writers face in participating in their disciplinary conversations because of a lack of explicit knowledge (e.g., Casanave & Li, 2008). My study has reported further findings on the impact of ineffective genre choices on the quality of writing where writers lack the relevant knowledge for the problem solving and evaluation required to produce successful writing.

I take a position in this study that aligns with the camp of writing and CT theorists such as Andrews (2007), Davies (2008), Hawkins (1998), Ennis (1998) and Siegel (1990), who advocate that students can be helped to acquire CT. I concur with Hawkins's (1998) reply to Atkinson (1997) that the fact that the mode of thinking and knowledge related to CT is foreign

to newcomers (not just non-Anglophone writers, see Flower et al., 1990, and Moore, 2011, for example) does not justify not "teaching" it because our goal as educators should be to give all learners "open access" to the privileged modes of thinking (p. 131). I would add that in doing so, CT would enable newcomers to "crack the secret code" and gain access to knowledge required to construct the privileged discourses that can be a "mystifying labyrinth" to them (Belcher & Braine, 1995, p. xv) so that they can participate in these discourses.

In the following sections, I will apply the conditions recommended by CT and writing theorists (Bailin et al., 1999b; Hyland, 2004b; Kurfiss, 1988) to propose activities that can support the acquisition of the knowledge required for operating in CT in academic writing. The conditions for acquisition include embedding instruction in the sociocultural context, making thinking visible and providing constructive guidance and coaching that will help learners gain awareness of the knowledge required and the practice to internalise it.

8.4.1 Embedding CT development activities in genre and discipline.

The first condition that can support the acquisition of knowledge, specifically genre knowledge required for the operation of CT is embedding learning activities in the discipline in which the genre to be enacted is situated so as to raise awareness of the sociocultural practices of the discipline that shape thinking and writing (Bazerman 1988; Berkenkotter et al., 1991; Flower, 1989, 1993; Hyland, 2004b; Nystrand, 1989) discussed in Chapter 3. Following are three examples of discipline-situated teacher-guided activities that can be designed to achieve this outcome.

To gain genre awareness of knowledge for decision making related to a genre feature such as ST (e.g., hedging), students could be presented with several examples of effective hedge use and non-use and guided to think about the social context contributing to the decisions with the help of question prompts such as:

- what reader-related conditions/expectations could have prompted the decision to hedge or not hedge?
- what message was the writer communicating in the degree of commitment signalled by the hedge chosen?
- was the decision appropriate in relation to the reader-related conditions/expectations?

The following are two examples of texts that can be used to answer the prompt questions. In the sample text that follows, students would be helped to "see" how the decision to hedge or not would have involved an awareness of genre knowledge such as the need for the writer to

accommodate the reader's possible positions, beliefs and biases in order to gain acceptance for their claims.

Sample Texts	Genre knowledge
(1) Academic criticism, broadly (hedged claim) defined as the linguistic expression of negative evaluation or disagreement (Stotesbury, 2006; Giannoni, 2005; Holmes, 2009), is a central feature of sound academic argumentation. (M1)	Reader expects their views to be considered. Degree of hedging signals the reader is likely to have other definitions of academic criticism.
(2) The centrality of academic criticism in the argumentative genre is (unhedged claim) well acknowledged (e.g., Hunston, 2005; Salager-Meyer & Zambrano, 2001; Stotesbury, 2006). (M1)	Reader expects their views to be considered. Decision to not hedge claim signals the reader is likely to agree that this claim is 'true'

Another discipline-situated activity to help students gain awareness of the knowledge required for situated-argument analysis, is to provide them with a number of claims to analyse with the help of prompt questions derived from a schema such as Toulmin (1958/2003). This schema as (described in Chapter 2) provides generic knowledge of useful concepts of how logical relationships in an argument are held and supports the evaluation of reasoning made in claims in a disciplinary context. It allows students to uncover discipline-embedded knowledge of "whatever sort of cogency or well-foundedness can relevantly be asked for in that field" (Kurfiss, 1988, p. 20), as mentioned in Chapter 2.

The situatedness of arguments and hence their analysis makes the teaching of decontextualised analysis suggested in common textbooks such as Cottrell (2017), and Bean and Ramage (2010), limited unless they are adapted for use in authentic discipline-specific analysis of arguments. The prompt questions and sample text below provide an example of how the acquisition of situated argument-analysis knowledge can be promoted.

Discipline-specific criteria for argument analysis include knowledge of relevant background information on the topic in question and knowledge of research methods to evaluate how authors of source texts arrive at their conclusions. This involves examining, for instance, the quality and kinds of evidence and how they are valued in the discipline (e.g., research results, anecdotes, analogies, generalisations, source texts, etc.), for the purpose of making judgements about the strength of claims. Some useful questions to guide situated-argument analysis can be adapted from Dobson and Feak (2001). Following are some examples of questions that can be used where relevant:

- what question is being addressed by the author?

- what conclusion does the author draw?

- what kind of reasons or evidence does the author offer to support those conclusions?

- was the evidence adequate in the discipline?

- how do the results/claims relate to other similar research?

- are any key terms ambiguous?

- what assumptions does the author make?

- why are the assumptions valid or invalid?

In the sample text below, which accompanies the preceding questions, learners can be helped to gain awareness of situated-argument-analysis knowledge such as the topic of the disciplinary research, the claim made about it, the evidence used to support it, the appropriacy of evidence (e.g., did the sources mentioned lead to the conclusion reached by the author?), the assumptions about the relationship between the evidence and the claim (e.g., why was the use of sources selected as evidence?), the validity of assumptions (e.g., is the use of source information in this way valued in the discipline?). Learners would also become aware that argument analysis in this instance would also include evaluating the claims in the source's information (evidence) to assess how they support the claim made by the author (*little empirical research has been conducted on the use of Hakka language in Hong Kong, in particular from a sociolinguistic perspective*).

Sample Text	Situated knowledge of argument analysis
Recent years have seen an increase in scholarly research on various aspects of Hakka language and culture, especially in Asia (M1) (Chou & Lau, 2001; Bacon-Shone & Bolton, 1998; Yang,1997)	
However, little empirical research has been conducted on the use of Hakka language in Hong Kong, in particular from a sociolinguistic perspective. (M2)	Topic of research Conclusion researched Evidence used Appropriacy of evidence in the discipline Assumptions the relationship between the evidence and conclusion (warrants) Validity of assumptions (backing)
Research question What are the factors most associated with Hakka (language) shift?	

Teacher-guided argument analysis could alleviate the apprehension students have about evaluating the work of academics (Belcher, 1995).

A final example of a discipline-situated learning activity could be one that guides students to acquire the genre knowledge required for problem solving. This could be an activity requiring students to create a task representation of a genre problem (task representation, which is one of the steps of problem solving, is taken here to be an example of a problem-solving activity). The activity would involve interpreting, differentiating and selecting relevant genre information from the disciplinary context to construct the task representation. For an activity such as constructing a task representation to solve a problem on the conventional use of stance features during text construction, learners could be guided to answer the following prompts derived from genre research on ST (e.g., Hyland, 1999, 2005b, 2008)

- what is the purpose of stance taking in your discipline?
- what is it used to communicate to the reader?
- what are some of the different options of devices that can be selected?
- what is the purpose of the different functions?

This activity can be followed up with a goal-construction activity for possible ST devices (e.g., the goal for hedging could read: to show the reader their possible different positions have been considered or to communicate that possible objections to a claim have been considered).

Students can then be asked to construct various versions of a single sentence using the different ST devices to signal various interpersonal relationships with their readers. They can then be asked to verbally explain what the selected device signals to the reader.

Since genre knowledge is embedded in the disciplinary context, it is necessary for writing professionals to work with their colleagues in the discipline to uncover disciplinary expectations and conventions for genre construction. This approach is advocated by most genre theorists and writing professionals (e.g., Hawkins, 1998; Hyland, 1999; Kwan, 2014; Lancaster, 2014). At the same time if it is logistically possible, writing and disciplinary specialists could work together to support students, giving students access to process some of the discipline-specific questions with these professionals in the discipline.

8.4.2 Making thinking and expectations for engaging in CT visible.

The next condition that can support the acquisition of knowledge required for the operation of CT to construct texts would be to create learning tasks that would make CT thinking visible. The need to make embedded and tacit knowledge visible is advocated both by cognitive science research on human learning (Halpern, 1998) and genre pedagogues (Hyland, 2004b).

The activities I suggest below are more complex than the activities I suggested in the previous section. They are designed to advance students to the thinking involved in decision making of genre choices where they would "see and hear" writing professionals verbalising the decision-making process behind genre choices.

An example of such an activity to guide students through the thinking processes involved in citation, move and ST choices is shown below. This example is taken from a successful text. Students can be given a "thinking processes checklist" to follow and tick the enactment of the process as the writing professional makes the processes visible by verbalising the possible processes out aloud and writing them out in the second column.

Sample Text	CT made visible in move and stance decisions
1.2 Research problem: the Hakka in Hong Kong (Sentence 1) Recent years have seen an increase in scholarly research on various aspects of Hakka language and culture, especially in Asia. (M1) (Reference P, Ref Q, Ref R)	- construct/see link between source information (*various aspects of Hakka…*) and the writer's research area (*factors most associated with Hakka maintenance and/or shift*) - construct/see link between previous and current section goals and macro-rhetorical-argument goal of text

(Sentence 2) However, little empirical research has been conducted on the use of Hakka language in Hong Kong, <u>in particular</u> (boost claim) from a sociolinguistic perspective. (M2)	• Apply macro-rhetorical-argument goal to decide what move to make
	• Apply rhetorical goal to decide what move to make after stating the territory (either to repeat the move to continue building the research territory or to create a research gap)
	• Apply goal of the move and macro-argument goal to evaluate source information negatively
	• Assess strength of gap claim and decide to boost it to achieve interaction goal of strengthening the force of persuading reader of the existence of a gap implying the need for the writer's research in this area.
Research question	
What are the factors most associated with Hakka maintenance and /or shift?	

An example from a less successful text can follow to provide a sample that displays missing thinking processes, as shown below. In this example, students would be asked to use the check list to identify missing CT processes and their consequences. The students would be made aware, as they use their checklist to follow the writing professional verbalising the processes, that the writer of the text has not enacted two of the six processes (seeing links and constructing links) with consequences on the rhetorical effectiveness of the text. The gap exposed on the neglect of writing-skills research does not have a direct bearing to the writer's specific area of research on the process of writing (*what are the effects of planning conditions […] and subplanning conditions […] on text quality, fluency, lexical complexity and Flesch reading ease…?*). The section goal of this text, to show the importance of writing skills, also does not have a bearing on contributing to defending the need for a study on the process of writing. Source information on research showing the lack of studies in writing processes would have displayed a stronger link between existing research and the writer's proposed research.

Sample Text	**CT made visible in move and stance decisions**
1.2.1 Importance of Writing Skills	
Among the four language skills, <u>writing</u> is a very important skill (Ref, A. Ref V, Ref Q) (M1)	• Weak link between source information (importance of *writing skills*) and writer's research area (*effects of planning conditions […] and subplanning conditions*)

	- Weak link between previous and current section goals and macro-rhetorical-argument goal of the text - Application of macro-rhetorical goal to decide on move to make
yet it is also the most (boost claim) neglected one (see reports by National Commission on Writing, 2003). (M2)	- Application of rhetorical goal to decide what move to make after stating the territory (either to repeat the move to continue building the research territory or to create a research gap) - Application of goal of the move and macro-argument goal to evaluate source information negatively - Assess strength of gap claim and decide to boost it to achieve interaction goal of strengthening the force of persuading reader of the existence of a gap implying the need for the writer's research in this area.
Research questions What are the effects of planning conditions […] and subplanning conditions […] on text quality, fluency, lexical complexity and Flesch reading ease…?	

The reasoning which is made visible (Hyland, 2004b) would enable learners to recognise both the successful and less successful aspects of the CT reasoning exposed in this excerpt. Making visible the reasoning behind decisions would likely also promote metacognition as students would be encouraged to review their reasoning and engage in the non-epistemic normative-evaluative component of CT for the purpose of defending their solutions or amending them. According to Halpern (1998), modelling reasoning encourages metacognitive strategies such as evaluating decisions, altering choices and reconsidering information that could have been overlooked.

A follow-up practice activity for making thinking visible in move, stance and citation decisions in a text can be a group activity where students are provided two short sample texts and asked in groups to expose the thinking processes in one or more genre choices in order to make a decision on which of the two samples was rhetorically more successful.

8.4.3 Providing constructive guidance and feedback.

The third condition that can support the acquisition of knowledge required for the operation of CT for text construction is the provision of coaching and feedback. This can be achieved through interaction with an expert member in the discipline by working on tasks where the tacit

and subtle elements of expert practice is made explicit (Dennen & Burner, 2008) through the interaction. The goal of these interactions would be to help learners gain access and acquire the requisite knowledge (e.g., language and behaviours), "enabling them to become participating members (instead of perpetual exclusion)" (Rogoff, 1995, p. 131). This condition follows from the earlier two conditions of embedding instruction and making thinking visible. In this condition, the students move from the earlier co-construction of solutions, to short tasks with the expert in group settings, to undertaking learning tasks that are more independent in nature.

At this stage, learners get to apply and practise the knowledge and skills acquired from the earlier activity types to their own writing tasks as well as to continue acquiring knowledge as they learn how to participate in the discipline through these activities. The role of the expert at this stage is mainly to provide guidance through explicit feedback. As mentioned in Chapter 2, by complementing the positioning of students within specific contexts of use and making thinking visible with the provision of explicit and constructive feedback according to clear criteria, learners are ensured that the quality of reasoning practices they acquire is based upon "rationale principles, upon insights into facts and their meaning" rather than on practices which "simply [fix] incorrect acts into wrong habits" (Dewey, 1964, p. 201).

Following are examples of how feedback can be provided for the acquisition of CT knowledge and thinking through the coaching of an expert. The examples are extracted from the interview data collected for this study.

Example 1: Interaction with experts and the acquisition of CT to direct what content to read

> Interviewee (text EX1B): I guess, through my previous postgraduate and research experience in the UK, before coming to Hong Kong… encountered scholars in the field that help me identify what to read.

> Apart from the area of Hakka studies, I… so I indicated just now, my study falls into sociolinguistics and bilingualism and Hakka studies. Hakka studies is probably the area that I was the least familiar with, despite being a Hakka speaker. So, for that particular area, I guess I had to put in more effort. But then, my supervisor for this research pointed me to a Hakka scholar in Hong Kong and that gave me point of departure.

> Interviewee (text EX1A): Also of course the conferencing or consultation sessions with her during my MA candidature, especially in the early stages of the thesis. Dr X would

suggest areas of literature that I could explore in relation to my research questions (e.g., Hunston, Hood). She also advised that I could start from the references section of Cheng's (2006) article on academic criticism, following up on the articles Cheng used in his research, and then read further from there.

In Example 1, the interaction with supervisors and learners in the field provided the guidance (*my supervisor for this research pointed me to a Hakka scholar in Hong Kong and that gave me point of departure; the conferencing or consultation sessions with her during my MA candidature, especially in the early stages of the thesis. Dr X would suggest areas of literature*) to both writers on where to start reading to build up the relevant content knowledge for their research. It can be extrapolated from the writers' comments that both writers also acquired the awareness of goal-directed reading to construct their thesis through their interaction with the experts. The writer of EX1B was directed by the *particular area* of their research that was least familiar to them based on her earlier experience with scholars who helped her identify what to read in relation to her field of study (e.g., *sociolinguistics, bilingualism*). EX1A was advised on what to read based on their *research question*. Kwan's (2009) study on how doctoral students navigated the complex landscape of the literature found that knowing how to select the key literature was a difficult task and was in many cases "facilitated by guidance provided by mentors such as thesis supervisors and panel members" (p. 180) who were members of the students' research field and familiar with the literature related to that field (Berkenkotter et al. 1988)

Example 2: Interacting with an expert through writing consultations to acquire CT knowledge for solving problems on how to use citations

Interviewee (EX1A): Regarding feedback on drafts, Dr X would comment on source use in her draft (e.g., Do you have a source for this? What is the purpose of this source? Review your citations to ensure their role in the argument is clear [or something like that – I can't remember the exact wording, and no longer have the drafts, but something to that effect], good [affirming a source well used], develop this [citation] and relate it to academic criticism, etc.)

In Example 2, the interaction with the supervisor during a writing conferencing session provided the writer of EX1A with explicit feedback in the form of questions and comments to guide their CT reasoning on how to use citations in their text. It can be extrapolated that, through this interaction with the expert, the writer acquired knowledge of a rhetorical perspective on the use of citations, i.e., to view citations as a means to persuade the reader to

agree with or at least to accept as reasonable their claims and supporting arguments, rather than to merely display knowledge. The questions and comments (*what is the purpose of this source; ensure their role in the argument*) by the mentor would have alerted the learner to pay attention to argument goals and the role of source knowledge with reference to these goals. This knowledge would be necessary for the learner to engage in CT required for selecting and reconfiguring knowledge in writing. This form of coaching entails the acquisition of CT in the context of the exigencies of the learner's own writing and the problems faced in the writing.

The three conditions for the acquisition of the knowledge for operating in CT in academic writing discussed in this section are interrelated and should all be present in a learning situation to facilitate the acquisition of knowledge that is situated in the context of use and "organically bound up with the activity being learned and its community of expert users" (Atkinson, 1997, p. 87). The term associated with situated-learning environments fulfilling the conditions for acquisition of knowledge described here is sociocognitive apprenticeship (see Casanave & Li, 2008). Rogoff (1995) uses the term guided participation for coaching and apprenticeship interactions (such as this) that promote the acquisition of knowledge that is tacit and embedded in the context of learning.

8.5 Summary

This chapter has synthesised the literature that contributed to the theoretical conceptualisation of the nature and role of CT and the findings and discussion based on genre analysis, to present an integrated model of CT for academic writing. It has theorised CT as a social-cognitive construct involving social-cognitive problem-solving reasoning and social-cognitive logical reasoning that enables thinkers to make judgements about what to believe and what to do. It has argued that CT comprises two elements (problem solving and evaluation) that were realised in texts as three main facets with one of the facets comprising two subfacets. They are CT occurring in problem solving, CT occurring in knowledge transformation and CT occurring in normative evaluation (epistemic and non-epistemic evaluation). The chapter has also listed the mental processes associated with the facets and presented how their operation or lack of it, in text construction has consequences on the quality of writing. The chapter has also emphasised the significant role CT plays in guiding decision making that achieves rhetorically effective and socially and culturally appropriate genre choices for the contexts in which texts are created to produce successful writing.

Six categories of knowledge for facilitating CT have been extrapolated from the analysis of CT in texts. They include how to solve problems, how to transform source information, how to analyse arguments, how to evaluate solutions to problems, knowledge of genre and adequate level of content/disciplinary knowledge.

The chapter has also applied the model of CT developed to provide a reinterpretation of existing CT terminology with the aim of bringing greater clarity, refinement and explicitness to the meaning of the notion, which, to date, has remained fragmented, incomplete and difficult to understand. Finally, it has also suggested activities and conditions for the acquisition of CT knowledge that is largely tacit and embedded, making it very difficult for novice writers to access.

Chapter 9
Personal reflections and closing remarks

There are five aims I hope to accomplish in this concluding chapter of my thesis. The first is to capture the defining moments in my PhD journey that have contributed to my own acquisition of the CT required for academic writing. I will do this by reflecting on those moments to articulate how the thinking and knowledge, discussed in my study, for engaging in CT became explicit to me, as well as identifying the situations and activities that facilitated my acquisition of CT. The second is to spell out the contributions of the study to the discourse community. The third is to acknowledge the study's limitations. The fourth is to suggest areas for further research. And the fifth is to leave the reader with my final remarks about the conceptualisation of CT developed in this study.

9.1 Growth in My Own Acquisition of CT for Academic Writing

The claim that the knowledge and thinking required to engage in CT is tacit and bound to the sociocultural context of the discipline (e.g., Atkinson, 1997; Gieve, 1998; Hawkins, 1998; McPeck, 1981, 1990) is significant to me as the investigator of CT and the writer of an extended academic text. I particularly identify with Belcher and Braine's (1995) observation that newcomers find it difficult to "crack the secret code" of the privileged genres or discourses that can be a "mystifying labyrinth" to them (p. xv).

I recall vividly how, at the start of my PhD journey, I grappled to work out how to situate my study because the literature relevant to my research topic was spread across several disciplinary areas (as mentioned in Section 1.7), such as curriculum studies, philosophy, psychology and higher education, to name a few, when my research area was in academic literacy, located in the broad discipline of applied linguistics (specifically in the field of EAP). In addition to this, though there were articles written on the conceptualisation of CT in the other fields, it was difficult at first for me to locate materials on CT in the field of my research. Also, while there were several calls in the literature to make the notion of CT explicit, there was not much work done to respond to the need. Further, the concept CT in academic writing literature appeared to be labelled in various ways by "insiders" (members of my disciplinary community) who, as I pointed out in my review in Chapter 1 (Section 1.2), not only had a tacit understanding of CT but also tended to adopt various interpretations of it. In this section I will describe four defining moments in which I was able to garner deeper insights into CT as I was studying it.

An early defining moment was when I chanced upon some materials and assignments from a course entitled "Culture and Conventions of Academic Writing" that I had taken in my home country prior to enrolling as a PhD candidate in the present institution. It jolted me to recognise that, though my topic and research questions required me to read work from several disciplines to build my content knowledge, my thesis was communicating only to the readers (examiners) who belonged to one discipline (applied linguistics). This meant that for me to display scholarship in my research and to communicate my research contribution in the discourse of my discipline, I needed to acquire knowledge about my disciplinary community. This knowledge included the names of members of the discipline who were associated with my research topic (e.g., Ann Johns, Becky Kwan, Brian Paltridge, Diane Belcher, Ian Bruce, John Bitchener, Ken Hyland, John Swales, Robyn Woodward-Kron, among others), their conversations, theoretical perspectives, biases and views, the writing conventions and practices they embraced, the jargon they used such as "moves," "rhetorical goal," "stance" and especially the terms they used for CT.

With this knowledge, I was able to engage in CT, which involved thinking processes such as differentiating (Beyer, 1995; Sternberg, 1986) source materials into "academic literacy" articles and "others," interpreting (Beyer, 1995; Facione et al., 1990; Raths et al., 1996) the various foci of researchers studying CT (reviewed in Section 1.7) and working out my contribution to the community in terms of how it was related to (seeing and constructing links; Beyer, 1985; Sternberg 1986) but different from (comparison; Raths et al., 1986) existing knowledge. Locating my study within the relevant body of literature was necessary for me to claim its contribution while drawing, where required, from literature outside my field of study (as discussed in Chapter 1). It also facilitated awareness of whose conventions and practices I needed to consider in decision making during text construction.

Another defining experience that contributed to my acquisition of the thinking and knowledge required for CT in academic writing occurred while I was auditing two courses for students in genre studies conducted by my field supervisor in Hong Kong. In "Research Methods in Language Studies (ESP),"[20] I heard my supervisor modelling the CT (making visible and explicit the knowledge and reasoning) required to "critically examine published research in various fields of English studies."[21] Modelling CT reasoning, for instance, involved evaluating

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[20] Research Methods in Language Studies (ESP) (course code EN6741), City University, Hong Kong
[21] Quote extracted from EN6741

the appropriacy of research methods and evidence used to advance claims in research papers in the discipline. The term epistemic evaluation is used for this form of CT reasoning in the model developed in the present study. It is the CT required to assess the strength of claims advanced and is discussed in Section 8.1.3. The knowledge and thinking required for its operation (e.g., identifying components of an argument, assessing validity of evidence in relation to what is appropriate in the discipline, identifying unstated assumptions or warrants) is listed in Chapter 8 (Table 8.2).

In "English for Academic Research and Publication,"[22] a writing course, I heard the supervisor modelling and making visible the reasoning and knowledge required for the move choices in research articles that contributed to the structure of its various sections. It was in these sessions that I first encountered what my study has now defined as social-cognitive (goal-oriented and genre-aware) CT reasoning, though, at that time, I did not have a label for name what I was "seeing" and "hearing" or a theoretical framework to defend it. What my field supervisor was doing was exhibiting knowledge and thinking required for problem-solving CT reasoning (e.g., applying genre knowledge to interpret conventions, anticipating and predicting reader expectations, applying macro/micro goal-directed thinking, seeing and constructing links) behind move choices framed by the knowledge of problem solving, genres and genre theory.

It became quite clear to me at this stage as well that, though the three-move CARS model (Swales, 1990) has received some criticism as a template method of teaching that does not promote thinking, this is really not the case. Rather, I saw how the CARS model was grounded in social conventions (e.g., the need to expose a gap in the literature to justify a proposed study) that provided the goal-directed reasoning for sequencing texts through moves. I also saw that because each move was interrelated to those that went before, and those that were coming after, there was the need to recognise and consider the links between moves that were enacted to ensure they contributed to the construction of a schematic structure that fulfilled a specific and socially expected argument goal (to justify the need for a writer's proposed research). I saw how the complex decision making of moves involved the need to be able to recognise social expectations and to translate them into rhetorical goals. I also saw that decision making of moves involved ensuring that the goals of sections and subsections that directed moves within

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[22] English for Academic Research and Publication (course code EN 8013), City University, Hong Kong

them aligned with one another to achieve the expected schematic structure of the text to fulfil its social purpose of arguing for the need of a proposed study.

A third defining experience was when I received feedback from my field supervisor on a draft conference paper to AILA (Association Internationale de Linguistique Appliquée/International Association of Applied Linguistics). Excerpts 1 and 2 below show her feedback on the weaknesses of the choices I made in presenting information in a table. The comments clearly show that as a novice and newcomer to the discourse of linguistic analyses, I had little knowledge of the discourse conventions and practices the reader was expecting of me.

Excerpt 1

Okay. But, when I read the table(s) below, I <u>expected</u> that there would be examples coming right after the tables. <u>But, they're not there.</u>

Excerpt 2

I find this table a bit misleading. <u>Normally</u> when you present a table with multiple columns, you <u>tend to</u>:

a) Elaborate the information of the first column in the second column and on. OR

b) You compare the information in the multiple columns.

However, your table does not seem to serve either of the purposes. I have made a few attempts to <u>try to understand the intention</u> of placing the two columns of information side by side. But, I couldn't <u>figure out the intention</u>.

Extracted from the draft of AILA conference paper

In presenting the analysis of my data as shown in Table 9.1 below, I chose to place the analyses of the two different segments (M1, M2) of my text beside one another in a two-column table and to present the description of how the data could be interpreted below the table.

Table 9.1

Discourse Acts in the Introduction Section of the LR

Discourse Acts for Territory Establishing (M1)	Discourse Acts for Problematising and Establishing Research Space (M2)
<u>Claim</u> significance } importance <u>debunk</u> to signal new takes } claiming	<u>Claim</u> existence of problem, <u>support</u> claim, explain possible reason for problem, <u>name</u> existing solutions

In my decision to present the text analyses this way, it did not occur to me to consider that the reader would need some annotation on the discourse acts in each move (M1, M2) for them to follow my interpretation of the contents of the table. The annotation would have included the example of the sentence reflecting the discourse act and what the acts meant.

The feedback on what is "normally" done and the need to make explicit my "intention" for showing the analyses in the table alerted me to what I needed to consider about the expectations of the reader. I was alerted to the problem of how to construct a table according to the conventions of my discourse community and made aware of the social knowledge I needed, to anticipate my reader's expectations. I also understood that I needed to show the reader that I could interpret the cultural conventions, and show them I could incorporate the cultural conventions, by constructing tables in a manner that considered the community's practices and conventions. The knowledge about expectations made explicit by my field supervisor contributed to the goals that directed how I presented my analyses, using annotations that would help the reader track my thinking, and how I interpreted that data to answer my research question. Cognitive modelling by my field supervisor facilitated my acquisition of knowledge required for presenting data and analyses in my discipline and my acquisition of the processes such as goal-directed thinking that was shaped by the knowledge (tacit) that readers in my discipline expected me to display.

A final defining experience that has contributed to my acquisition of the thinking and knowledge required for CT in academic writing relates to the explicit feedback on the writing of this thesis that I have received from my content supervisor. This feedback specifically gave me insight into how to engage in the CT reasoning required for knowledge transformation. The feedback is presented in Excerpts 3 and 4 below.

Excerpt 3

> This may be workable but, instead of <u>merely telling</u> what the literature says, build arguments to construct how the CT … you discovered in Chapter 2, <u>operate and interact</u> with each other in rhetorical problem presentation, goal-directed decision making

Excerpt 4

> Foreground the CT model you are constructing; give it and its processes (evaluation, etc.) prominence. The <u>sources</u> like F and Hayes, Toulmin, etc come into your text only to <u>serve your purpose</u> of constructing the CT model and arguing its legitimacy This

way, you'll write a superior Chapter 3; you'll show the examiner your capabilities in integrating knowledge from sources and transforming judiciously selected knowledge to serve your chapter level goal to construct a coherent model of CT for use in writing classrooms. (Extracted from draft 1 of Chapter 3)

In the original version of my Chapter 3, I merely described (retold) the literature on how problem solving operated in academic writing using Flower and Hayes's (1981) cognitive process theory of writing. I was not consciously applying this literature (*integrating knowledge from sources and transforming judiciously selected knowledge*) to serve my rhetorical goal of constructing a CT model for academic writing and justifying its legitimacy by showing how the goal-directed decision making described in Flower and Hayes's theory was an integral part of the problem-solving component of the CT construct I had identified and argued for in Chapter 2.

It was only after I received the feedback shown in Excerpts 3 and 4 that I was alerted to the need of transforming source information. I recognised that solving the problem of how to use source information required CT reasoning, which involved considering how the source information could serve the rhetorical goal of the argument of the text I was constructing. In the instance I described above, CT involved using source information such as Flower and Hayes (1981) in Chapter 3 to back up the claim that problem solving described in the previous chapter (Chapter 2) occurred in academic writing. Apart from reconfiguring (Sternberg, 1986) the cited source (Flower & Hayes, 1981) to serve a new purpose, transformation also involved demonstrating how this claim was relevant to the ongoing conversation about the components of CT in academic writing within the discipline and situating it in these conversations so as to "participate in the actions of [this] community" (Miller, 1984, p. 165). The CT processes required here included interweaving (Bailin et al., 1999b; Beyer, 1995) the source information to fit the developing text by making connections between citations and between citations and the texts (Beyer, 1995; Sternberg, 1986). My acquisition of CT was facilitated by the content supervisor making explicit through her feedback what I needed to consider in my reasoning: to transform source information from the literature for use in the construction of the argument I was making in my new text. I also realised while writing Chapter 8 that the approach my content supervisor used to apprentice me can be categorised as what I have described as guided participation in Section 8.5.3.

9.2 Contributions of the Study

The study has contributed a model of CT that is operational in academic writing. This model offers a more holistic interpretation of CT to the discourse community's understanding, which is currently predominantly based on a philosophical tradition. The model, which captures the complexity of the notion theorised by CT theorists, conceptualises CT in academic writing as a social and cognitive construct that integrates an understanding of CT from both the philosophical and psychological traditions.

The integrated problem solving and normative-evaluative reasoning purported in the CT model is able to account for how writers decide on genre choices (e.g., move, citation and stance taking) in text construction. Significantly, it is able to account for how writers can make genre choices that are socially appropriate and rhetorically effective, strongly suggesting that the role of CT in academic writing is to guide problem-solving and normative-evaluative reasoning required for successful writing. As such the model has the potential of helping students in their text generation efforts to produce better quality writing.

The three facets of CT derived from texts analysis and the literature provides a framework to reinterpret existing terms and interpretations of CT in the literature. This contributes to a more specific, more explicit, more refined and less nebulous picture of CT that can be used by students and writing professionals to develop CT for academic writing.

The tacit and embedded nature of CT, with its core elements, facets, mental processes and knowledge required for operation, and the role it plays in text construction uncovered in this study have also contributed to an understanding of the conditions required for the design of activities and learning environments to help students acquire CT.

Finally, this study has also contributed to the methodology of studying CT through the use of genre analysis, thereby extending the current application of genre analysis to the study of CT in academic writing.

9.3 Limitations

The types of limitations or potential limitations covered in this section are mainly related to methodological considerations. They include the inability to locate interview participants and the decisions related to the selection of the sub-genre and the number of texts to analyse.

First, the unavailability of all four EX writers to provide interview data (as mentioned in Section 4.5, is the main limitation of the present study. I was only able to locate two of the four writers with the help of the academics who nominated the texts in the exemplary sample. The additional data from the remaining interviewees could have further augmented the current interpretation of findings on the nature and role of CT in academic writing by providing confirmation as well as additional insights into the writers' thinking processes, knowledge for operating in CT and the learning environments that facilitated the acquisition of this knowledge. Nevertheless, the interview data (though not the complete set) that I was able to collect and use provided some valuable and useful insights to support the interpretation of the nature and role of CT in the texts analysed for successful writing.

Next, the selection of the Introduction sub-genre may have limited the range of CT processes extrapolated through genre analysis as other sub-genres such as the Discussion chapter require writers to perform more complex levels of synthesis and assimilation of information to construct the chapter. Despite this potential limitation, the decision was made to select the Introduction sub-genre as it provides an ideal starting point for the study of CT. Besides this, the CT model developed through the analysis of the Introduction chapter can be applied to other genres and sub-genres for further development, if additional processes are found to be involved in text construction.

Finally, though the number of texts selected in this study could potentially be a limitation, a smaller rather than a larger sample was used because the purpose of conducting the GA on sample texts was to understand how the theoretically derived nature and role of CT applied to the construction of successful texts. As such, the aim of the GA was not to make generalizations about successful and less successful writing (which would have required a large sample), but to make generalization about the nature and role of CT and how it can contribute to successful writing.

9.4 Further Research

One aspect of the present study that lends itself to further research is to test the impact of the CT model developed in this study on the quality of post-instruction academic writing. This can be done by designing a writing course that covers the core facets of CT, the associated thinking processes and knowledge identified in this study, and implementing the activities and learning environments proposed in the section on pedagogical implications (Section 8.5).

Course pedagogies could include those developed to expose genre/disciplinary knowledge through activities embedded in the disciplinary context, to expose the mental processes in the various facets of CT through activities that make thinking visible and to provide constructive feedback through coaching in a group writing task where group members are responsible for the effectiveness of different genre features in the common writing task. This can be followed up by a final independent writing assignment on the target genre. Pre- and postwriting samples can then be compared to measure the impact of the model on the quality of writing.

A follow-up strand of the above research could be to collect discourse-based interview data and reflections on reasoning behind genre choices of texts written by successful writers. Interview data and reflections would capture CT knowledge and the reasoning students engaged in and may illuminate any additional considerations in decision making not captured in my model.

Another area of research that can be a useful follow-up to the present study is to use my CT model to interview the authors of research papers in selected disciplines to obtain information on the knowledge and thinking processes behind their decision making. This would involve collating information on the patterns of use of various genre features such as moves, ST devices and citations in the discipline in question before setting up a discourse-based interview with the group of authors in the discipline. It would also involve familiarising the interviewees with my CT model to use as a framework for explaining their decision making. The study would be able to yield discipline-specific knowledge and thinking on the operation of CT in academic writing, which is derived from expert writing in the discipline using my CT model.

9.5 Conclusion

In bringing my thesis to a close, I want to reiterate the point with which I began my conceptual chapter (Chapter 2): like all previous attempts at conceptualising CT (Gieve, 1998), mine has been shaped by a social purpose to serve a function. The first social purpose was to develop a theoretical construct of CT of the nature and role of CT in academic writing (Chapters 2 and 3) which could serve as a framework for understanding how CT could contribute to successful writing.

The resulting conceptual model derived from the application of the theoretical framework to the analyses of authentic texts is a starting place for the contribution of a description of CT as social-cognitive problem solving and logical reasoning involved in making decisions about genre features, transformation of information and epistemic as well non-epistemic evaluation.

This thinking, with its associated processes (e.g., goal-directed reasoning, anticipating and predicting reader expectations, seeing and constructing links), is interpreted to be exercised by writers in the context of social interaction with other members and texts of a discourse community in text construction to serve a social function (e.g., argue for the need of a proposed study). It is conceptualised as requiring knowledge (e.g., how to solve problems, how to transform information, how to analyse arguments, how to evaluate solutions, how to acquire genre knowledge and an adequate level of content knowledge) and thinking processes that are largely embedded in the sociocultural context, tacit in nature and shared by members of the discourse community who engage in CT to produce knowledge-creating texts that are labelled successful according to the norms and conventions of the discourse community. CT has been conceptualised as more than the display of overt "critique" or critical evaluation, to be realised both covertly (in instantiations of problem solving, knowledge transformation and non-epistemic evaluation) and overtly (in instantiations of critique, epistemic stance and epistemic evaluation) in academic writing texts.

The conceptualisation of CT developed in this study also serves a second social function. By filling a gap in existing academic writing literature, the conceptualisation provides a model for writing professionals and supervisors to help students fulfil the CT requirement for successful writing. My study has attempted to make the knowledge and thinking required for CT to construct successful texts, accessible to all students. But, as Bailin et al. (1999a) put it, there will never be a single conceptualisation that can be adequate to fit all contexts or serve all purposes. As such, the validity of the construct developed in the present study lies in the extent to which it has achieved its purpose – to provide a defensible conceptualisation of CT that can be used to explain its nature (occurrence and operation as instantiations in textual choices) in academic writing and its role in achieving genre outcomes that are socially appropriate and rhetorically effective, accounting for the difference between successful and less successful academic writing.

Appendix 1 Application for Ethics Approval

Office of the Vice-Chancellor
Research Integrity Unit

**THE UNIVERSITY
OF AUCKLAND**
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

The University of Auckland
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UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE

22-Feb-2013

MEMORANDUM TO:

Prof Judith Parr
Curriculum & Pedagogy

Re: Application for Ethics Approval (Our Ref. 8755)

The Committee considered your application for ethics approval for your project entitled **A Framework for Designing Critical Thinking Instruction Using Literature for Thesis Writing**.

Ethics approval was given for a period of three years with the following comment(s):

1. In the Project Overview Information, please consider whether the date for Phase 3 should be January 2014 instead of 2013.

2. Please carefully proofread the CFs for the Dean and Supervisors again after the tracked changes have been accepted. For example, on the CF (Supervisors) first bullet point, 15 should read 15 min.

The expiry date for this approval is 22-Feb-2016.

If the project changes significantly you are required to resubmit a new application to UAHPEC for further consideration.

In order that an up-to-date record can be maintained, you are requested to notify UAHPEC once your project is completed.

The Chair and the members of UAHPEC would be happy to discuss general matters relating to ethics approvals if you wish to do so. Contact should be made through the UAHPEC ethics adminisatrators at humanethics@auckland.ac.nz in the first instance.

All communication with the UAHPEC regarding this application should include this reference number: **8755**.

(This is a computer generated letter. No signature required.)

Secretary
University of Auckland Human Participants Ethics Committee

c.c. Head of Department / School, Curriculum & Pedagogy
   Dr Rebecca Jesson
   Ms Santhakumari Thanasingam

Additional information:
1. Should you need to make any changes to the project, write to the Committee giving full details including revised documentation.

2. Should you require an extension, write to the Committee before the expiry date giving full details along with revised documentation. An extension can be granted for up to three years, after which time you

must make a new application.

3. At the end of three years, or if the project is completed before the expiry, you are requested to advise the Committee of its completion.

4. Do not forget to fill in the 'approval wording' on the Participant Information Sheets and Consent Forms, giving the dates of approval and the reference number, before you send them out to your participants.

5. Send a copy of this approval letter to the Manager - Funding Processes, Research Office if you have obtained funding other than from UniServices. For UniServices contract, send a copy of the approval letter to: Contract Manager, UniServices.

6. Please note that the Committee may from time to time conduct audits of approved projects to ensure that the research has been carried out according to the approval that was given.

Appendix 2 Taxonomies

A compilation of various CT taxonomies

Mental activities /Thinking operations (Raths et al.,1986)

1. Compare
2. Classify
3. Observe
4. Summarise
5. Interpret
6. Evaluate/Criticize
7. Draw and support inferences
8. Look for assumptions
9. Predict
10. Analyse
11. Synthesize

Mental activities / Thinking operations (Ruggieri, 1984, p. 63)

1. Making important distinctions such as truth versus opinion; fact versus knowledge; fact versus interpretation
2. Ask questions of the data that will generate meaning-producing operations
3. Recognise instances of their invalid and unjustified use

Skill clusters (Ennis, 1987)

1. Clarifying issues and terms
2. Identifying components of arguments
3. Judging the credibility of evidence
4. Using inductive and deductive reasoning
5. Handling argument fallacies
6. Making value judgements

Mental processes (Bailin et al., 1999b)

1. Classifying
2. Inferring
3. Observing
4. Evaluating
5. Synthesizing
6. hypothesizing

Core-skills and sub-skills (Facione et al., 1990)

1. Interpretation (categorization, decoding significance, clarifying meaning)
2. Analysis (examining ideas, identifying arguments, analysing arguments)
3. Evaluation (assessing claims, assessing arguments)
4. Inference (querying evidence, conjecturing alternatives, drawing conclusions)
5. Explanation (stating results, justifying procedures, presenting arguments)
6. Self-regulation (self-examination, self-correction)

Microthinking skills, critical thinking operations, thinking strategies (Beyer, 1995)

Level 3 Micro-thinking Skills

1. Recall -to remember facts and bits of information
2. Translation -to put into simpler or different terms
3. Interpretation -to explain
4. Extrapolation -to infer or estimate by extending/projecting known information
5. Application- to use know in information in new settings/situations
6. Analysis- to separate a concept/idea/entity
7. Synthesis -to combine elements into a coherent concept/ide/entity
8. Evaluation-to judge, to determine the goodness/badness, rightness/wrongness, appropriateness/inappropriateness of a situation, concept, idea, etc.

Level 2 Critical Thinking Operations

1. Distinguishing facts from values claims
2. Distinguishing relevant from irrelevant information
3. Determining factual accuracy of a statement
4. Determining credibility of source information
5. Identifying ambiguous claims or arguments
6. Identifying unstated assumptions
7. Detecting bias
8. Identifying logical fallacies
9. Recognising logical inconsistencies in a line of reasoning
10. Determining the strength of an argument or claim

Level 1 Thinking strategies

Conceptualizing

1. Identify examples of practice, behaviours
2. Identify common attributes of the examples
3. Classify the attributes
4. Interrelate categories of attributes (build a concept)
5. Identify additional examples an nonexamples (to see whether the concept fits/works)
6. Modify the concept (and attributes if necessary)

Decision making

1. Define goals
2. Identify alternative approaches
3. Analyse each alternative (pros and cons)
4. Rank alternatives
5. Determine the highest ranked alternatives (why are they highest ranked)
6. Choose the best alternative

Problem solving (Newall & Simon, 1972)

1. Recognize the problem
2. Represent /describe the problem

3. Device or choose a plan for solution
4. Execute the plan
5. Evaluate the results

Cambridge Assessment Taxonomy (Black, 2008)
      www.iaea2008.cambridgeassessment.org.uk/ca/digitalAssets/164791_Black.pdf

Analysis

- Recognising and using the basic terminology of reasoning
- Recognising arguments and their assessments
- Recognising different types of reasoning
- Dissecting an argument
- Categorizing the components parts of an argument and identifying its structure
- Identifying unsated assumptions
- Clarifying meaning

Evaluation

- Judging relevance
- Judging sufficiency
- Judging significance
- Assessing credibility
- Assessing plausibility
- Assessing analogies
- Detecting errors in reasoning
- Assessing the soundness of reasoning within an argument
- Considering the impact of further evidence upon an argument

Inference

- Considering the implications of claims, points of view, principles, hypothesis and suppositions
- Drawing appropriate conclusions

Synthesis/construction

- Selecting material relevant to an argument
- Constructing a coherent and relevant argument or counter-argument
- Taking arguments further
- Forming well-reasoned judgements
- Responding to dilemmas
- Making and justifying rational decisions

Self-reflection and self-correction

- Questioning one's own preconceptions
- Careful and persistent evaluation of one's own reasoning

Problem Solving (Facione, 1984)

Problem solving steps:

1. Determining background knowledge
2. Generating initially plausible hypothesis
3. Developing procedures to test hypothesis
4. Articulating an argument from the results of these testing procedures
5. Evaluating the arguments
6. Revising the initial hypothesis (where appropriate)

Newall & Simon (1972)

Information Processing Problem Solving Model

1. Construct a model of the problem
2. Analyse the current state
3. Identify constraints
4. Gather information
5. Generate one or more hypotheses
6. Test hypothesis until goal is achieved

Voss, Greene, et al. (1993)

Problem -solving steps

1. task environment (statement of the problem; context and conditions in which it is found),
2. problem space (information that may be useful to solving the problem such as problem goals and sub-goals to reach the solution; actions or operators that can enable solver to reach the solution; knowledge of constraints under which problem has to be solved)
3. problem representation (accurate representation of the problem to be solved)
4. problem solution activity (actions taken toward goal)
5. evaluation (means-end-analysis to determine if previous actions have achieved the target goal

Hayes (1981)

Problem -solving steps

1. representation of a problem (find the problem; represent the problem)
2. the execution of a solution (plan the solution; execute the solution)
3. evaluation of the solution (assess how good the result is)
4. consolidation

Ennis (1987)

1. Formulating hypotheses
2. Considering alternative views of viewing a problem
3. Posing questions
4. Considering possible solutions
5. Making plans for investigating something

Halpern (1998)

1. Understanding how cause is determines

2. Recognizing and criticizing assumptions
3. Analysing means-goals relations
4. Giving reasoning to support a conclusion
5. Assessing degrees of likelihood and uncertainty
6. Incorporating isolated data into wider framework
7. Using analogies to solve problems

Sternberg (1986)

Skills

1. Meta-components- higher order executive processes
   recognizing that a problem exists, defining the nature of the problem, deciding on a set of steps for solving the problem, ordering these steps into a coherent strategy, deciding upon a form of mental representation for information, allocating one's time and resources for solving a problem, monitoring one's solution to a problem as the problem is being solved, and utilizing feedback regarding problem solving after one's problem solving has been completed.

2. Performance components – lower order, nonexecutive processes used to execute the instructions of the meta-components, and provide feedback to them
   inductive reasoning, deductive reasoning, spatial visualization, reading etc

   inductive reasoning – encoding stimuli, comparing stimuli, inferring relations between stimuli, mapping relations, applying relations from one domain to another, justifying potential responses and responding.

3. Knowledge -acquisition components processes used to learn concepts and procedures
   Selecting encoding- screening irrelevant from relevant information

   Selective combination -putting together relevant information in a coherent and organized way

   Selective comparison – relating old, previously known information to new about to be learned.

Compilation Taxonomy of CT skills from numerous theorists (Gubbins, 1985)

1. **Problem Solving**
   1. Identifying general problem
   2. Clarifying problem
   3. Formulating hypothesis
   4. Generating related ideas
   5. Formulating alternative solutions
   6. Choosing best solution
   7. Applying solution
   8. Monitoring acceptance of the solution
   9. Drawing conclusions
2. **Decision Making**
   1. Stating desired goal/condition
   2. Stating obstacles to goal/condition

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3. Identifying alternatives
4. Examining alternatives
5. Ranking alternatives
6. Choosing best alternative
7. Evaluating actions

3. Inference

Inductive thinking skills

- Determining cause and effect
- Analysing open-ended problems
- Reasoning by analogy
- Making inferences
- Determining relevant information
- Recognising relationships
- Solving insight problems

Deductive reasoning skills

- Using logic
- Spotting contradictory statements
- Analysing syllogisms
- Solving spatial problems

4. Divergent Thinking Skills

- Listing attributes of objects/situation
- Generating multiple ideas (fluency)
- Generating different ideas (flexibility)
- Generating unique ideas (originality)
- Generating detailed ideas (elaboration)
- Synthesizing information

5. Evaluative Thinking

- Distinguishing between facts and opinions
- Judging credibility of source
- Observing and judging observation reports
- Identifying central issues and problems
- Recognising underlying assumptions
- Detecting bias, stereotypes, clichés
- Recognising loaded language
- Evaluating hypothesis
- Classifying data
- Predicting consequences
- Demonstrating sequential synthesis of information
- Planning alternative strategies
- Identifying stated and unstated reasons
- Comparing similarities and differences
- Evaluating arguments

6. Philosophy and reasoning

- Using dialogical/dialectical approaches

Appendix 3 Coding Guidelines

Guidelines for achieving congruence in move/step coding

Step 1: Functional Decisions to identify textual boundaries (Paltridge, 1994)

Functional approach to boundaries and staging in a text: when coding a segment of a text using the functional approach, the analyst asks the questions "how does this segment help achieve the local purpose and the macro purpose of the text?' Eg. Micro purposes are M1 - establish research territory, M2 - establish niche, M3 – occupy niche. All 3 moves, particularly M1 and M2 have the macro purpose of convincing R of the need for R's research which W occupies in M3. Our analysis only covers M1 and M2 until W occupies the gap in M3.

Step 2: Segment text according to broad move functions (M1, M2, M3) with the help of step 1. Then identify the steps/strategies that realise the Move. Label them with the help of the following:

Look at [I have expounded/clarified Appendix 1 from Kwan's thesis to facilitate this]

1. Topic (Participant) - affectors, affected, phenomenon or events (nominal group)
2. Process – (in Move 3 eg locutionary-reporting, mental processes - examining, descriptive process - representing something)
3. Claim – what is the assertion made by W – refers to an assertion W makes about a phenomenon eg in M1 claim about magnitude, salience, intensity of phenomenon understudy – to accentuate its values or relevance. Claims in move 2 primarily relate the W's assertions of deficiencies in the field, M3 – assertion about W's contribution to the gap established in M2

As mentioned earlier, the overall Segmenting is according to M1, M1, M3 based on functional labels what is the function communicated [establish research territory, justify research gap, contribution to gap]

Step 3: Identify Attributes within Moves to label the steps that realize the Move – identify steps
[I have expounded/clarified Appendix 1 from Kwan's thesis below to facilitate this]
M1

1.1 **Centrality – claiming**: Semantic group = Phenomenon + centrality; semantic features of the semantic groups; lexical realization of the sematic group
1.2 **Making topic generalization** [findings cited alone as knowledge claim] – neutral statement about existing state of the territory [falls into 3 categories (Swales 1990) namely, knowledge, practice or phenomenon) - **Semantic group** = phenomenon + state of art (existing **knowledge** about it); **semantic features** of group-knowledge, practice, definitions, explanation, clarification, examples; **lexical realization**
1.3 **Reviewing items of previous research** [assertions about research **process**]: **Semantic group** = research processes; **semantic feature of group**-researchers, research aims, subjects, processes/events, research instruments; **lexical realization**
M2

Semantic attribute of **evaluative** statements about state of art neutral statements provided (topic

promotional claim, or **neutral descriptive account** of knowledge or research events) in M1. Signalled by adversative marker 'however', 'nevertheless', 'yet', 'unfortunately' and 'but'. Signal for emergence of semantic features for M2.

2.A **Counter-claiming:** assertion of **defects** of some specific aspects of the state of the art. (eg flaws in research designs in previous studies-research orientated defects; another type of defect – inconsistent research results generated from previous research implying unsatisfactory state of understanding of the topic under study, defects can also refer to faulty assumptions in existing knowledge such as theories, beliefs, models and /or unsatisfactory practices without referring to any epistemic research events or procedures): **semantic group**: defects in established knowledge claims or previous research; **semantic feature of group** – flaws, limitation, inconsistencies; **lexical realization** – problem, concerns, inaccurate, limited etc

2.B **Gap-indicating** – relates deficits of knowledge, research and non -research actions. Semantic group= deficits of knowledge or research actions; **Semantic feature** of group= scarcity or paucity of research, scarcity or paucity of knowledge, needs for actions; **lexical realization** – 'little research', 'few studies'; 'little is known', 'not much is known'; 'there is a need', 'research into X is valuable' or 'it is worthwhile to…'

2.C Question –raising: by far the least discussed thus semantic features are set up a priori to include both direct and indirect questions which W research addresses [I would classify this differently depending on the semantic attribute of the semantic group] Semantic group = questions-raising; semantic feature of group= questions, queries; lexical realization = 'what would be the relationship between X and Y?'

2.D Continuing a tradition – W proposes that a line of research be allowed. Semantic group=extending tradition; Semantic features of group = research method, research approach, non- research practice, extension; lexical realization – X should be continued; more research is needed to extend this line of research.

M3

Announcing the present research

Most studies report this-common steps Introducing the purpose of the research, presenting the present research (aims, nature) –refer to Appendix 1
Summary

1) identify boundaries
2) Determine segment for detailed coding
3) Code (as per guidelines for expert text

 coding) **Additional points**

Note section headings and work out their function. The goal of the Introductory chapter is to justify the need for writer's research so the main expression of this chapter should be "expression of research purpose" and how it is justified.

It has been found in other research that 'nearly all Introductions have sequences of text identifiable

as the 3 moves in Swales (1990) CARS model- Establish Territory, Establish Niche, Occupy Niche.

Of course moves could be cyclical rather than linear (Bunton, 2002) but the important point for the analyst is to follow the purpose of the whole segment before deciding on a label for the step/strategy and deciding what move it belong to or should belong to! This is where our propositional content analysis will prove helpful. The flow of information should help us in this decision making as analysts.

My guidelines are developed based on my theoretical framework. I have used what other researchers in the field have suggested where appropriate and then extended, clarified these guidelines to establish what I feel for good analysis to be inter-rater reliability between coders.

Appendix 4 The Semantic Scheme for Move/Step Coding[i]

Move 1 Establishing the territory

Claiming centrality

Semantic feature group (sources)	Features	Examples of lexical realisations
Epistemic (research) phenomena (Swales, 1990; Lewin et al., 2001)	• researchers • research aims (or researched phenomena) • research products • a research phenomenon	*Investigators, researchers* *Self-access learning* has received research attention… It has been *found that*… *Studies* of … *Research* has been done
Non-epistemic (nonresearch) phenomena related to the topic (Connor & Mauranen 1999; Lewin et al., 2001; Samraj 2000)	• non-research phenomena or activities • non-research people related to the topic • circulation of publications	*teaching, stress, self-access learning discussion of* *teachers, students,* *… literature of*
Direct centrality of the above features (Kwan 1996; Lewin et al., 2001)	• significance • importance	X is a *significant* phenomenon Y is *important*…
Indirect centrality of the above features (Swales 1990; Kwan 1996; Lewin et al., 2001)	• magnitude • salience • intensity • recency • frequency • prevalence • impact • influence	There is *growing* literature… X has been existing *for a number of years* *In recent years,…* *A wide range* of inability *A spate of* interest X is *an influential figure* *Mounting* encroachment

Making topical generalisations (or reporting what is known about the phenomena under study)

Semantic feature group (sources)	Features	Examples of lexical realisation
The phenomenon under study (Swales 1990)	• non-research phenomena, activities or practices • non-research people related to the topic • knowledge	*teaching, stress, self-access learning discussion of* *teachers, students,*
Terminology (Duszak 1994; Kwan 1996; Anthony 1999; Lewin et al., 2001)	• Explanations • Definitions • Clarifications of concepts • Examples to illustrate the above	*X means…* *Y is defined as…* Z *defines* Y as… X *means*… whereas Y *refers to*… *One example* is that…

Reviewing previous research items (research processes)

Semantic feature group (sources)	Features *	Examples of lexical realisation
Research processes (Lewin et al., 2001)	• Researchers • Research aims • Subjects • Research processes • Research instrumentation	*Johnson, Ma & Spencer (1999)* found that… The researchers studied *the X phenomenon* The researchers studied *a group of students*… The researchers *interviewed … think aloud protocols*… *The questionnaire,*… *The software* used to…

Move 2 Establishing a niche

Counter-claiming

Semantic feature group (sources)	Features	Examples of lexical realisation
Defects in established knowledge claims or previous research (Swales 1990; Pieque & AndreuBeso 1998; Samraj 2000; Lewin et al., 2001)	• Flaws • Limitations • Inconsistencies	*Problems, concerns, inaccurate, a view being limited, the limitation of a research method;* The study *failed to…,* The research *did not explain…* *Inconsistencies, different findings, disagreement,*

Gap-indicating

Semantic feature group (sources)	Features	Examples of lexical realisation
Deficits of knowledge or research actions (Swales 1990; Pieque & AndreuBeso 1998; Samraj 2000; Lewin et al., 2001)	• scarcity • paucity • gaps • needs	*Few has been done…* *Little has been found* *X remains unexamined..* *Y is left unanswered…* *There is a gap in…*

Question raising

Semantic feature group (sources)	Features	Examples of lexical realisation
Question-raising	• questions • queries	What would be the relationship between X and Y?

Continuing a tradition

Semantic feature group (sources)	Features	Examples of lexical realisation
Extending a tradition	• A research method • A research approach • A non-research practice • Extension	X should be continued More research is needed to extend this line of research.

Move 3 Announcing the present research (occupying the niche)

Announcing the purposes

Semantic group (sources)	Features	Examples of lexical realisation
Introducing aims of the thesis (Swales 1990; Lewin 2001; Bunton 2002)	• The researchers • The research • The research report • Discursive processes • Research processes • Purpose or aim of the research/ report • Contents of the report	*We, I, the author* The *study, investigation, research, analysis* Identifiers + product: *This paper, the present report,, the current study* This paper will *present, report, ...* This paper *will analyze ..., examine…* *The purpose ...* Name the phenomena under study

Announcing the work carried out

Semantic group (sources)	Features	Examples of lexical realisation

Introducing work done (Bunton 2002)	• The researchers • The research • Events arising from the research	*author* *study, test, research*

Announcing research method

Semantic group (sources)	Features	Examples of lexical realisation
Describing one's own research method (Bunton 2002)	• Data-collection • Design of procedures	Interviewing Experimenting Qualitative

Materials or subjects

Semantic group (sources)	Features	Examples of lexical realisation
Describing the writer's own research materials or subjects (Bunton 2002)	• Research instruments • The researched	Questionnaires, interview protocols, tests Subjects, informants, students, teachers

Findings or results

Semantic group (sources)	Features	Examples of lexical realisation
Summarizing findings or results (Bunton (2002)	• Research • Analytical processes • Claims of findings and results	Study, research, investigation, test, Found, identified, confirmed, show, suggest, Results, findings

Significance and justification

Semantic group (sources)	Features	Examples of lexical realisation
Showing the significance or justifying one's own research (Bunton 2002)	• Research • Claims of significance • Reasons	Study, investigation, Important Because, reasons,

Thesis structure

Semantic group (sources)	Features	Examples of lexical realisation
Announcing the structure of the thesis (Bunton 2002)	• Document • Chapters • Themes	Report, thesis, etc. Chapter + number Literature review, methodology, etc.

Appendix 5 Discourse-Based Interview

Interview Guide

Dear

Thank you very much for agreeing to participate in my study. Your thesis was nominated as exemplary in its quality of writing and critical thinking by your supervisor. We believe, both you (the writer) and your writing can provide rich resource to help our understanding of advanced academic writing development.

The initial part of this study focused on the Product (text) and comprised an analysis of nominated theses. A discourse analytic framework to study critical thinking in research writing was used to compare the discourse features of exemplary and non-exemplary texts.

This second part of the study will focus on the Process (cognitive and social) involved in enacting and developing critical thinking knowledge for research writing. **Critical thinking in this study is conceptualised as the reasoning required for decision making related to discourse choices that are enacted and realized in research reporting texts.** Discourse choices in this study have been categorised into decisions related to (1) argument structure and organization (2) propositional content development and (3) evaluation of propositions made or cited using lexical choices to convey your stance and/or engage your reader for the purpose of convincing them.

There are two sections of questions in the following page of this interview guide. The first section of questions requests input on how you made discourse-based decisions in the instances identified. The text that was analysed in relation to this interview is attached to provide the context for your responses. The second category of questions requests input on the social process that supported your development as a writer in this respect.

Kindly read through the questions in preparation for our 30 min to 1 hour interview session. You may wish to write out the answers and send them to me before the interview session. This way, I can use the interview time to clarify or further probe your answers. Alternatively, you may use your answers to guide our time and then return the answers to me at the end of the session. I hope to be able to record our interview unless you have any objections.

Your participation and input in this study is greatly appreciated as we work toward advancing our knowledge on how novice writers of research reporting texts can be supported and empowered to participate in their respective discourse communities. Please be assured that your identity will be kept strictly confidential.

I am planning to conduct the interview between 6 and 12 October 2014. Please suggest a convenient time for the session (any day except for Wednesday of that week). Do also feel free to clarify any questions you may have about the questions asked.

Thank you very much.

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Main supervisor : A/P Barbara Grant

Co-supervisors : Dr Antonia Chandrasegaran, Dr Constanza Tolosa

Advisor : A/P Becky Kwan

Introduction

Please indicate the disciplinary community your work belongs in: _____ (the community comprises the scholars whom you cite, the people whom you expect will read your work and the field you are making your contribution of knowledge to.

Further comments (if any): _____

The goal of my interview is to understand how you gained the necessary knowledge to enable you to participate through writing as a legitimate member of your discourse community. My focus in particular is to understand how **you developed knowledge about discourse decision making** (ie. **your reasoning)** that has enabled you to construct texts in a way that fulfils the expectations of your discourse community.

Part 1: Understanding decision-making in text construction

Theoretical assumption: it is assumed that as a writer in your discourse community, you possess knowledge of the writing conventions and practices of this community. This knowledge would include knowledge of the genre you are expected to construct, rhetorical knowledge related to how members in your community convince readers of claims they make and knowledge of content you are writing about. This knowledge would enable you to make effective discourse decisions for constructing texts that can meet the expectations of your readers.

Please read through your Introduction text before reflecting on and answering the following questions. The questions relate to your decision making in the 3 areas of (1) argument structure and organization (2) propositional content development and (3) evaluation of propositions made or cited using lexical choices to convey your stance and/or engage your reader for the purpose of convincing them.

How did you go about making the following decisions in the Introduction you wrote:

Propositional content development

- What literature to read for your study
- What content of the literature to select for your study
- What to use literature for in your study
- How to incorporate literature into your developing text (especially when there are several source texts and where you are using others work for your own purpose rather than for purely to "display information")

Evaluation of propositions made or cited using lexical choices to convey your stance and/or engage your reader for the purpose of convincing them

- How to select appropriate linguistic resources to use for displaying "evaluation" of propositions cited or made by using stance and engagement indicators when trying to convince your reader of claims made.

Argument structure and organization

- How to structure your argument (eg. did you have a specific argument schema in mind based on how members of your discourse community structure arguments?)
- How to order your propositional content for the Introduction?

Part 2: Understanding the socialisation process into the discourse community

The second part of the interview seeks to understand how you were helped/guided in your developmental journey to acquire knowledge about (1)how to write in the expected way and (2) how to make appropriate discourse decisions for this. It will be helpful if you can be specific when answering the following questions by giving examples and citing specific instances where help was rendered (how and in what respect). If you have illustrations in the form of artefacts and the like, it would make our understanding more concrete.

Please reflect on and answer the questions below which relate to your Introduction.

How did you develop knowledge about the following:

Propositional content development

- What relevant literature to read
- How to select literature for use in the study
- How to use literature appropriately

Evaluation of propositions made or cited using lexical choices to convey your stance and/or engage the reader for the purpose of convincing them.

- How to evaluate arguments/propositional claims
- What linguistic resources to use for displaying stance and engagement when trying to convince/argue your reader of you claims [ie. what language resources to use to convince your reader about your claims].
- How to use the linguistic resources to convince/argue appropriately and effectively

Argument structure and organization

- How to structure arguments effectively in your discipline
- How to order your propositional content effectively for the Introduction

-THANK-YOU-

Space for Reflection & Answers

Appendix 6 Compilation of Excerpts

Chapter 5

EX1B enacting move pairs M1-M2 successfully to expose a research gap

Excerpt 5.1A	Annotation
1.1.2 The study of <u>language shift</u>	language shift =topic of sub-section heading
<u>Language shift</u> in both immigrant and non-immigrant communities has been the focus of much sociolinguistic research for a combination of related reasons… (M1)	language shift = topic of M1 propositional content
However, the great majority of <u>this research</u> has been <u>restricted</u> to the American, European and Australian <u>contexts</u>. (M2)	this research refers to topic of language shift research in M1 restricted = limitation of existing research
What are the factors most associated with Hakka (language) shift?	language shift = topic of research question

NE2C enacting move pair M1-M2 less successfully to expose a research gap

Excerpt 5.1B	Annotation
1.2.1 Importance of <u>Writing Skills</u>	Writing = topic of sub-section heading
Among the four language skills, <u>writing</u> is a very important skill (M1)	writing = topic of M1 propositional content
yet <u>it</u> is also the most <u>neglected</u> one (see reports by National Commission on writing, 2003). (M2)	it refers to writing research in M1 neglected = limitation of existing writing research
What are the effects of <u>planning conditions (..) and sub-planning conditions (</u>..) on text quality, fluency, lexical complexity and Flesch reading ease…?	planning and sub-planning conditions = topic of the research question

EX1B enacting move pair M1-M3 successfully to show how studies in the literature apply to their study

Excerpt 5.2A	Annotation
1.1.3 The study of <u>code-switching</u>	code-switching = topic of the sub-section heading
Two European studies that have made use of such a complementary approach are Gal (1979) in her study of <u>language shift</u> in Oberwart, Austria, and perhaps	Language shift = topic of the M1 propositional content

more systematically, W. Li (1994) in his study of language shift among the Tyneside Chinese community in the UK. (M1)	
It is one of the goals of the current study to utilise a similar framework to gain understanding of the sociolinguistic practices of a bilingual Asian community that is undergoing language shift. (M3)	similar framework refers to approaches in studies mentioned in M1 Language shift = topic of the M3 propositional content
Research question What are the factors most associated with Hakka maintenance and/or shift?	language shift = topic of the research question

NE2D enacting move pair M1-M3 less successfully to show how studies in the literature apply to their study

Excerpt 5.2B	Annotation
Creative strategies in advertising	creative strategies = the topic of the sub-section heading.
Later, the Resnik and Stern's classification was applied to the study of magazine, newspaper, and radio advertising. (M1)	classification = topic of M1 propositional content
Similar studies were conducted in different parts of the world including United States (Laczniak, 1979; Stern et al., 1981; Healey and Kassarjian, 1983; Harmon et al., 1983; Chou et al., 1987), Australia (Dowling, 1980), Canada (Pollay et al., 1980), the United Kingdom (Tylor, 1983), Japan (Madden et al., 1986; Hong et al., 1987), China (Rice and Lu, 1988), India (Khan et al., 1991), South Korea (Keown et al., 1992) and Hong Kong (Chan, 1986). (M1)	similar studies refers to the use of classification system mentioned in the first M1by others in the field.
Resnik and Stern's classification system was adopted in this study due to its well-established baseline and tested reliability. (M3)	classification system = topic of M3 propositional content
No research question provided in the text	the reader has to work out that NE2D's study is about various aspects of advertising by reading the research aim and other parts of their introduction chapter.

EX1A enacting move pair M2-M3 to successfully to show the gap the writer's study will occupy

Excerpt 5.3A	Annotation
1.2.5 The gap in existing studies of <u>academic criticism</u>	academic criticism = topic of sub-section heading
These studies have in general shed light on how academic criticism is an intricate verbal act that manifests along a cline from more covert to overt expressions depending on the social and rhetorical context in which it is enacted but they are <u>insufficient</u> for language educators such as General Paper teachers who have an interest in intervening in their students' specific <u>academic criticism</u> practices to help them improve…. (M2) The need to <u>gain an informed, evidence-based understanding</u> of the moves and evaluative meanings that characterize more expert enactments of <u>academic criticism</u> in General Paper essays is the impetus behind the <u>present study</u>. (M3)	insufficient =limitation of existing academic criticism research academic criticism = topic of M2 propositional content gaining informed evidence-based understanding= aim of proposed study academic criticism= topic of M3 propositional content
What moves manifest in successful enactments of <u>academic criticism</u> but are less frequently observed in less successful enactments?	academic criticism = topic research question topic

NE2C enacting move pair M2-M3 less successfully to show the gap the writer's study will occupy

Excerpt 5.3B	Annotation
1.4.2 Significance of the Study	Significance = sub-section heading signally M3 propositional content
An examination of eight prominent <u>writing models</u> seems to reveal a <u>weak consideration</u> of cognitive processes in writing performance, <u>inadequate work</u> carried out on cognitive sub-processes in writing performance, and a <u>lack of 'holistic understanding</u> of the effects of manipulating task variables on writing performance…. (M2)	Writing models= topic of M2 propositional content Weak consideration.., inadequate work.., lack of 'holistic…'= limitation in existing research
Thus, I hope that through <u>this empirical study,</u> <u>tentative ESL writing models</u> that focus on the effects of manipulating planning conditions, pre-task,	Writing models= topic of propositional content Establishing tentative writing models= contribution of present study

extended pre-task, free-writing, sub- planning conditions, topic-given, topic-ideas given and topic-ideas-macrostructure given and revising conditions, revising with and without draft on text quality <u>can be established.</u> (M3)	
What are the effects of planning conditions (..) and sub-planning conditions (..) on text quality, fluency, lexical complexity and Flesch reading ease…?	Planning conditions, sub-planning conditions= topic of research question

EX1B enacting moves M1-M2-M3 within a sub-section to justify the approach to study language shift

Excerpt 5.4A	Annotation
1.1.2 The study of <u>language shift</u>	language shift = topic of sub-section heading
In order to understand the phenomenon of <u>shift</u>, most sociolinguistic studies of <u>language shift</u> have focused on identifying its probable causes and the factors most associated with promoting or hindering the process. (M1)	language shift= topic of M1 propositional content
Indeed, various models have been developed in an attempt to isolate a specific set of sociolinguistic and linguistic factors that can be used to predict the occurrence of <u>language shift</u>, incorporating such variables as age, gender, language attitudes, community size, the cultural distance between the majority and minority language and societal language policy (Romaine, 1989). (M1)	language shift =topic of second M1 propositional content
However, what has been found applicable to one particular community has <u>not necessarily</u> been found <u>applicable to another</u>. (M2)	Not necessarily..applicable= limitation of existing models mentioned in M1
Although <u>language shift</u> is usually described as a community phenomenon, the <u>group behaviour</u> of abandoning one language in favour of another is <u>in effect an aggregate of the choices made by individual members</u> of the community in question. (M2)	language shift= topic of second M2 propositional content in effect an aggregate = flaw of existing approaches implied in M1
An account that takes into consideration individual variation and motivations is therefore likely to	language shift = topic of third M2 propositional content

provide a <u>more complete picture</u> of <u>language shift</u> within a community. (M2)	more complete picture…= evaluation of proposed approach to use for study of language shift
It is <u>from such a perspective</u> that the current study is carried out. (M3)	from such a perspective = approach to be taken in present study introduced in M3
What are the factors most associated with Hakka <u>maintenance and/or shift</u>?	language shift =topic of research question

EX1B enacting moves M1-M2-M3 to achieve coherence within and between two subsections

Excerpt 5.4B	Annotation
1.1.3 The study of <u>code-switching</u>	code-switching =topic of subsection heading
One of the most striking features of bilingualism is <u>code-switching</u>, the alternating use of two or more languages or language varieties in the same stretch of discourse (Auer, 1984a). (M1)	code-switching = topic of M1 propositional content
One strand of current <u>code-switching</u> research focuses on the interactional aspects of switching, which was first inspired by Gumperz' work on bilingual interactive strategies (e.g., Blom & Gumperz, 1972; Gumperz, 1982). (M1)	code-switching =topic of second M1 propositional content
Gumperz' interactional approach to <u>code-switching</u> was further developed by Auer (1984), but his model of bilingual conversation was based on a sequential analysis of conversational <u>code-switching</u> that focuses on the details of the ongoing interaction, in contrast to the classificatory approach taken by Gumperz, where the many functions of code-switching are merely presented as a list of categories. (M1)	code-switching = topic of third M1 propositional content
An account that incorporates both a micro-level analysis of the patterns and uses of <u>code-switching</u> among individual speakers and a macro-level analysis of language choice in different situations is likely to provide <u>more insight</u> into the bilingual practices of a community undergoing <u>language shift</u>	code-switching =topic of first M2 propositional content more insight = evaluation of strength of proposed code-switching approach code-switching and language shift = relationship between two topics established in this M2 move

than one that focuses only on the latter aspect, as most traditional research has done. (M2)	language shift =topic of the second M2 propositional content
Two European studies that have <u>made use of</u> <u>such a complementary approach</u> are Gal (1979) in her study of <u>language shift</u> in Oberwart, Austria, and perhaps more systematically, W. Li (1994) in his study of <u>language shift</u> among the Tyneside Chinese community in the UK. (M2)	such a complementary approach = refers to code switching which is the second topic of the M2 propositional content made use of = support for the code-switching approach mentioned in the previous M2 to contribute to the demarcation of this move M2
	similar framework = refers to code-switching which is second topic of the M3 propositional content
It is one of the goals of the current study to utilise a <u>similar framework</u> to gain understanding of the sociolinguistic practices of a bilingual Asian community that is undergoing <u>language shift</u>. (M3)	language shift =topic of the M3 propositional content similar framework = applies previous approach in M2 to present study in M3
What are the factors most associated with Hakka <u>maintenance and/or shift</u>?	language shift = topic of research question

EX1B enacting moves M1-M2-M3 to achieve coherence within and across three subsections

Excerpt 5.4C	Annotation
1.2 Research problem: the <u>Hakka</u> in Hong Kong	Hakka= topic of subsection heading
Recent years have seen an increase in scholarly research on various aspects of <u>Hakka language</u> and culture, especially in Asia. (M1)	Hakka =topic of M1 propositional content
However, <u>little empirical</u> research has been conducted on the use of <u>Hakka</u> in Hong Kong, in particular from a sociolinguistic perspective. (M2)	little empirical research from sociolinguistic perspective= limitation of current research on Hakka language. Hakka =topic of M2 propositional content
A language survey by Chow and Lau (2001) provided some useful indication of the status of <u>Hakka</u> in Hong Kong, while studies by Lau (2000, 2001b) have chiefly <u>focused on the historical or dialectological aspects</u> of <u>Hakka</u> in Hong Kong. (M2)	Hakka =topic of second M2 propositional content focused on historical..= evaluation of scope of existing research on Hakka
Lau showed that the <u>Hakka</u> variety that is spoken in Hong Kong is essentially <u>homogeneous</u> throughout	Hakka =topic of third M2 propositional content

the territory and is <u>more or less identical</u> with the <u>Hakka</u> that is spoken in neighbouring regions, including the border region of Shenzhen in mainland China. (M2)	homogenous, more or less identical = description of findings reported in previous M2
While census evidence points to a <u>rapid decline</u> in <u>Hakka</u> over the past century, <u>further sociolinguistic inquiry</u> would help explain how various factors at the societal and individual levels influence the extent to which this threatened language variety <u>is maintained or lost.</u> (M2)	rapid decline = continuation of a description of findings reported in the previous M2 moves Hakka =topic of fourth M2 propositional content further sociolinguistic inquiry = need in existing Hakka research Hakka and and language shift (maintained or lost) = relationship between two topics established in this fourth M2 move
1.3 Research aims and objectives This study is informed by two complementary levels of sociolinguistic inquiry, the goal of which is to provide an integrative account of the <u>bilingual language practices</u> of members of the <u>Hakka-speaking population</u> in Hong Kong. (M3)	Hakka= topic of M3 propositional content Bilingual language practices= implies the study of code switching practices
What are the factors most associated with <u>Hakka (language) maintenance and/or shift</u>?	Hakka and language shift= relationship between two topics in research question

NE1C enacting M1-M2-M3 within a subsection to justify the approach to study task prompts

Excerpt 5.5A	Annotation
1.3 Rationale for the study	
<u>**Task prompts**</u> – Writers' understanding of <u>task prompts</u> and task expectations are likely to affect the manner in which the research is carried out and how the research paper is written up. (M1)	Task prompts= topic of M1porpositional content
For example, students' interpretation of the expected genre of the research paper might be different from the requirements of the <u>task prompts</u>….. (M1)	
To understand the task requirements or the demands made of the students, researchers (Kroll, 1979; Swales, 1982; Bridgeman & Carlson, 1984;	Task prompts= topic of second M1porpositional content

Horowitz, 1986a, b; Hale et al.; Carson, 2001; Moore & Morton, 2005) have examined the content, rhetorical structure, and linguistic features of <u>task prompts.</u> (This is described further in Chapter 3)… (M1)	Task prompts= topic of third M1porpositional content
But while many of the above-mentioned studies took students perceptions of the <u>prompts</u> and the instructors' expectations into consideration, they <u>did not examine</u> student papers in order to analyse the possible relationship between the <u>prompts</u> and its impact on the discourse of the resulting papers. (M2)	Task prompts= topic of M2 propositional content did not examine = limitation in existing task prompts research
….One study (Beck & Jeffrey, 2007) that <u>did examine</u> the relationship between <u>prompts</u> and the resulting papers looked at the mismatch of the benchmark papers with the requirements of the prompt. (M2)	Task prompts= topic of second M2 propositional content
The researchers <u>studied the relationship</u> between the genre expectations implied in the <u>task prompts</u> and the genre of the papers written in response to these prompts….(M2)	studied the relationship = evaluative comment of existing task prompts research
The focus of the study was <u>different</u> from that of the present study and others reviewed in this thesis (and discussed further in Chapter 3) in that Beck and Jeffrey were examining what sorts of genres were specified in the writing prompts used in the high-stakes Scholastic Aptitude Test (SAT) in the United States as well as whether the benchmark papers reflected the requirements of the <u>prompt</u>… (M2)	Task prompts= topic of third M2 propositional content different = evaluative comment of existing research
While this study differs in its focus, it informs my thesis as it shows that a structural analysis and analysis of the linguistic features of the <u>task prompts</u> can help to identify task expectations that can then be compared to the genre of the resulting research paper. (M3)	Task prompts= topic of fourth M2 propositional content Task prompts= topic of fifth M2 propositional content

What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?	Task prompts= topic of research question

NE1C enacting moves M1-M2-M3 that lack coherence within and between two subsections

Excerpt 5.5B	Annotation
1.3 Rationale for the study	subsection positioned after subsection on context of study
<u>**Discourse Conventions**</u> <u>–</u>	discourse conventions = topic of sub-section heading
To be able to interpret implied <u>genre expectations</u>, students need to understand the <u>discourse conventions</u> in their area of study. (M1)	genre expectations = relationship between discourse conventions and task prompts implied in genre expectations is found in the final M3 move of previous excerpt. discourse conventions = topic of M1propositional content
In a seminal paper, Bartholomae (1985) too points out that even students who write well need to learn how to write and <u>structure</u> their papers and to 'learn to speak our language' (p. 273)….. (M1)	Structure=relationship between structure and discourse conventions is unclear
In a study that examined student essays written in response to task prompts, Spack (1988) called for writing instructors and university lecturers to provide more scaffolding for student writers to help them <u>organise</u> their ideas for their research papers. (M1)	Organise= relationship between organise and discourse conventions is unclear
The difficulties students face, specifically in <u>framing</u> their papers, have been a recurrent theme in a number of studies of first-year student writing (Bartholomae, 1985; Perry-Woodley 1991; Harris, 1995; Yin, 2000; Leki & Carson's 1997; Schleppegrell, 2004). (M2)	Framing = relationship between framing and discourse conventions is unclear
As these researchers show, novices face great difficulties in writing research papers. (M2)	

More specifically, developing writers have been noted to have difficulty in producing functional Moves, expressing evaluations, stating assumptions, making comparisons, and stating causal relationships (Schleppegrell, 2004). (M2)	Conventions= relationship between understanding conventions in M2 and moves, expressing evaluations etc in previous M2 is unclear
Among other reasons, this may be a case of writers not knowing or understanding the conventions of the genre. (M2)	
In examining the role of writing centres and writing instructors as well as the needs of first-year university students, Harris (1995) found that the majority of students discussed approaching writing instructors for help as they did not know how to structure their papers. (M2)	
Likewise, Leki and Carson's (1997) study of students' experiences of learning to write research papers in order to make the transition from writing classes to other academic courses revealed the unexpected finding that several students stated finding it difficult to organise their ideas and structure their research papers. (M2)	
Given these recurrent findings, it is possible that students do not know how to use rhetorical moves to achieve the purpose of the task. (M2)	Do not know how to use rhetorical moves= unclear how knowledge of rhetorical moves relates to structure paper and organise ideas
To achieve this, it will be necessary to examine the discourse structures used by experts…. (M3)	
However, the key factor in understanding student writing will be to take the students' experience of writing the papers and their motivations for using certain discourse features in to consideration in order to be able to address their needs and to help them overcome their perceived writing difficulties. (M3)	Students' experience= unclear how students' experience relates to discourse convention which is the topic heading of this subsection

What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?	Task prompts= topic heading of research question

NE1C enacting moves M1-M2-M3 that lack coherence within and across three subsections

Excerpt 5.5C	Annotation
1.3 Rationale for the study	
<u>**Learning to Write**</u> **Research Papers –**	Learning to write = topic of heading of subsection Learning to writer= coheres with experience in final M3 of excerpt 5.5.B Research papers = coheres with second M1topic in 5.5.A and fourth M2 topic in 5.5B
Researchers looking at the <u>experience of students learning to write research papers</u> have examined different approaches taken by students in writing different types of research assignments (Nelson, 1990; Macbeth, 2004; Fletcher, 2004; Berkenkotter et al., 1991; Rhodes, 1998; Nielsen & Rocco, 2002; Cho, 2005) (discussed further in Chapter 3). (M1)	Experience of learning to write= topic of the M1 propositional content coheres with subsection on heading learning to write
All the studies reviewed above indicate that the student research paper is a separate genre and that the papers are <u>shaped by the student' research experience.</u> (M1)	research experience = does not cohere with topic of experience of learning to write
But research in this tradition shows that student research papers have several unique features, including the <u>use of experiential knowledge</u> (Spigelman, 2001), and that the students struggle with the task of writing (Sommers & Saltz, 2004; Grobman, 2009). (M1)	experiential knowledge = does not cohere with topic of experience of learning to write
For instance, Spigelman (2001) argues that the 'telling of stories can actually serve the same purposes as academic writing, and the <u>narratives of personal experience</u> can accomplish serious scholarly work' (p. 64)…. (M1)	Narratives of personal experience = does not cohere with topic of experience of learning to write

To study the <u>writing experience</u>, the student's voice can be taken into consideration and the students' roles of being novice writers and researchers in the university will allow researchers 'inside students' learning' (Sommers & Saltz, 2004, p. 146) (M3) experience. (M3)	writing experience = topic of the M3 propositional content coheres with subsection on heading learning to write
This involves analysing both the <u>writer's experience</u> as well as the text produced by writers. (M3)	writer's experience = topic of the M3 propositional content coheres with subsection on heading learning to write
What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?	Task prompts= topic of the research question
How do novice writers describe their <u>experiences</u> as research writers?	Experiences = topic of the research question

Chapter 6

EX1B's effective use of attributive citations to build a research territory

Excerpt 6.1 *[EX1B]*	**Annotation** how attributive citations are used to build knowledge required for the study's research territory
1.1.1 The study of bilingualism: a variable and dynamic phenomenon	
According to Kornakov (2001), among bilingual individuals, it is possible to distinguish four stages of bilingualism: the establishment of bilingualism, established bilingualism, the losing of bilingualism and lost bilingualism. (Attribution) (M1)	Citation providing information about the bilingual process in individuals.
The same may be said of a bilingual community. (M1)	Information about process introduced earlier generalised to bilingual communities.
Romaine (1989) describes the classic pattern as a once monolingual community becoming transitionally bilingual as a stage on the way to the eventual extinction of its original language. (Attribution) (M1)	Citation used to provide/build knowledge about how the bilingual process occurs in a community
When minority and majority languages are used in the same social contexts, this is likely to lead to language shift, defined by Weinreich (1953) as the	Claim relating the bilingual process introduced earlier to language shift.

change from the habitual use of one language to that of another. (Application) (M1)	This claim exposes how the knowledge presented in the preceding attributive citations contribute to building the research territory on language shift (the topic of the research question in this study).
Societies which have maintained the use of their disparate languages for many generations might appear to be in a stable state of bilingualism but as Chambers (2003) notes, stable bilingualism is a relative term because language changes constantly, as do the social circumstances it serves. (Application) (M1)	
This is evidenced in the example of Oberwart, a community which eventually shifted to German monolingualism in spite of sustaining a state of bilingualism in Hungarian and German for at least four centuries, due to social change in the community (Gal, 1979). (Exemplification) (M1)	
Research question What are the factors most associated with Hakka (language) shift?	Claim of significance: to justify the need for a study on language shift on Hakka.

NE2D's less effective use attribute citations to build a research territory

Excerpt 6.2 *[NE2C]*	**Annotation:** Information presented in attributive citations do not contribute to building the research territory of the writer's proposed study.
1.2.3 Current Solutions to Writing Difficulties	
First, genre approaches to teaching of writing have been advocated by some researchers such as Swales (1990), Halliday (1985, 1994), Hyland (2003, 2004, 2007), Schleppegrell (2004) and Christie (1998) (attribution) as they have promised many benefits to learners (see Christie & Martin, 1997; Hyland, 2003, 2004, 2007). (further reference). (M1)	Citations providing information on genre theoretical approach to teaching writing who advocated the approach promised benefits
Genre theory arises from three main schools of thought, Systemic Functional Linguistics, English for Specific Purposes (ESP) and New Rhetoric approach (Hyland, 2003; Johns, Bawarshi, Coe, Hyland, Paltridge, Reiff & Tardy, 2006). (attribution) (M1)	Citations providing information on the origins of genre theory

	No link made between genre theory and the writer's own research on the effect of planning conditions on the writing process.
Genre approaches to teaching of writing involve a discourse analysis of texts to illustrate how language is used to achieve the social purpose of the context. (M1)	Citations providing information on the methods employed in genre pedagogy and research findings on the positive results of the genre approach. No statement or indication made however on the relevance of genre pedagogy or its effects on the writer's specific research territory on planning conditions in the writing process.
For example, Schleppegrell (2004) (exemplification)has illustrated how field, mode and tenor of texts were constructed to realize ideational, interpersonal and textual functions of texts. (M1)	Citation used to illustrate how genre approach has been applied
The explicit pedagogies in genre based teaching of writing involve building the context, modelling and deconstructing of texts, analysing the language use in the texts to achieve the functional purpose& joint negotiation, independent construction and linkage to related texts (Hyland, 2003,2007). (attribution) (M1)	More information on methods used in genre pedagogy
Cheng (2008) examined the effects of teaching 26 Taiwan college freshmen the functional approach to writing in an EFL composition course. (attribution) (M1)	Information on research findings
Cheng (2008) found that students improved in rhetorical moves in content development, textual coherence and language use, as seen from pre to post tests. (attribution) (M1)	Information on research findings
Chandrasegaran and Yeo(2006) found that after teaching some elements of the genre approach to writing to 33 Secondary 3 students in Singapore, the students' awareness of rhetorical goal in writing narrative texts, the quantity of epithets and ideational tokens increased in their post-instruction essays. (attribution) (M1)	Information on research findings
Pang (2002) compared the effects of two different genre-based approaches to the teaching of writing, a textual-based and a contextual-awareness approach,	Information on research findings

on L2 Hong Kong undergraduates' writing. (attribution) (M1)	Information on research findings
Pang (2002) found that the textual-analysis approach yielded better results on mechanic elements of the genre whist the contextual-analysis approach yielded better results on rhetorical elements. (attribution) (M1)	
Research question What are the effects of planning conditions (..) and sub-planning conditions (..) on text quality, fluency, lexical complexity and Flesch reading ease…?	Claim of significance: the need to study the effects of planning and sub-planning conditions in the writing process.

EX2B's effective use of evaluative citations to legitimize the writer's proposed study

Excerpt 6.3 [EX1B]	Annotation how evaluative citations contribute to legitimizing the writer's proposed research
6.1 Literature background	
In the past two decades there has been no dearth of research on writing in academic disciplines. (M1)	
Riazi (1997) for example, summarized 20 studies related to writing and academic disciplines during 1984-1994. (exemplification) (M1)	
The decade-odd time following that period has seen a continuation of interest in the topic among researchers in academic literacy.(M1)	
In particular, there has been a growing interest in the writing at the graduate school level (e.g., Belcher & Braine, 1995; Berkenkotter et al., 1988, 1991; Casanave, 2002; Hyland, 2004; Prior, 1998; Ventola & Mauranen, 1996), involving both NES and NNES students. (attribution) (M1)	
However, in spite of the large number of studies, underexplored areas remain. (M2)	
Firstly, most of the studies were concerned with students in the humanities and social sciences, although there have been a few exceptions of published studies that featured NNES science	Citations used to support evaluative comment on lack of existing studies on writing for publication. Comment on lack of research in science

research students (Blakeslee, 1997; Dong, 1996; Gosden, 1996; P. Shaw, 1991). (Evaluation) (Establishing links between sources) (M2)	
Secondly, whether working with NES or NNES students, <u>most studies</u> were conducted in North American universities; there is still a <u>general lack of parallel</u> research with NNES students in non-Anglophone settings, such as <u>Asian universities</u> (Braine, 2002). (Evaluation) (M2)	Comment on lack of research in non-Anglophone settings These citations contribute to exposing the gap in the exiting research territory which is required to legitimize the writer's study on the need to study writing for publication among science doctoral students in China (research objective).
Thirdly, the studies tended to be "housed" in the context of a disciplinary curriculum, i.e., examining how individual students represent and fulfil coursework writing tasks. (M2)	
For science research students, however, the essential writing task tends to <u>consist of writing for publication</u> in specialist journals <u>rather than fulfilling coursework</u> (Gosden, 1995, 1996; Leki & Carson, 1997). (Evaluation)	Citations used to support evaluative comment on lack of research in writing for publications for science research students This citation further strengthens the need to study writing for publications among science students.
Research objective (no RQ provided) To understand various aspects of writing for publication among science doctoral students in China (paraphrased from NE2Bs thesis introduction)	Claim of significance: to justify the need to study writing for publication of science doctoral students in China.

NE2D's less effective evaluative use of citations to legitimize the writers approach for their study

Excerpt 6.4 *[NE2D]*	**Annotation**
	Evaluative comments do not contribute to legitimizing the writer's selection of the approach for their study. Writer expresses evaluation through a cited source.
Language of Advertising	

Cook (1992) describes discourse of advertising as complex with 'text' and 'context' put together, interacting in a way which is perceived as meaningful and unified by the participants. (M1)?	
He criticises many studies of advertising for <u>separating out components of ads, concentrating on one or a few and ignoring the others.</u> (evaluation) (M2)	Citation used to evaluate other approaches to the study of advertising to expose limitations. Comment on ignoring components in studies of advertising.
Thus, there are studies of advertising which have <u>little or nothing to say</u> about its pictures or music or the people who create it, but there are also studies, which describe the pictures of advertising <u>without paying any attention</u> to language. (evaluation) (M2)	Comment on incomplete analysis of in studies of advertising.
Cook (1992) further points out that describing advertising as discourse is both <u>more complete</u> and <u>more difficult</u> than any of these approaches, for it means <u>trying to describe all these elements, and their effects on each other.</u> (evaluation) (M2)	Comment on strength of proposed approach
The present study will <u>make use</u> of Cook's (1992) framework to analyse advertising language. (application). (M3)	Unsuccessful application of previous evaluative comments to justify the writer's selected approach for the study of various aspects of advertising. The previous evaluative comments on the completeness of the discourse approach to study all elements of advertising do not justify the use of the approach by the writer who aims only to study the language of advertising.
Research aim The study of various aspects advertising	Claim of significance: to legitimize the need to study various aspects of advertising

EX1B's effective use of application citations to build a research territory

Excerpt 6.5 *[EX2B]*	Annotation
	how application citations are used to build the research territory for the writer's research question

7.1 Literature and theoretical background	
From a social constructionist perspective, <u>scholarly texts are composed in anticipation</u> of or in light of the reactions and criticisms from the intended readership, often the gatekeepers (the editors and referees) of a target journal above all (Berkenkotter & Huckin, 1995; J. Flowerdew, 2000a; G. Myers, 1985). (attribution) (M1)	
Such a social constructionist view not only points to the social dimension of research writing, but its political dimension as well, for the <u>author-gatekeeper interaction</u> is hinged upon a power inequity between the two.(M1)	tension experienced by doctoral students
G. Myers (1985, p. 595) attributed a tension inherent in the power inequity to the conflict over novelty claim, the crux of all research writing: "On the one hand, the <u>researcher tries to show that he or she deserves credit for</u> <u>something new</u>, while, on the other, the editors and <u>reviewers try to relate the claim to the body of knowledge produced by the community.</u>" (application) (M1)	Citations are applied to show how ideas in source texts apply to supporting the claim about tensions between students and gatekeepers introduced earlier. tension between the researcher deserving credit and reviewer relating the writer's work to the common body of knowledge
Yet apart from the tension resulting from arguments over novelty claim, the author-gatekeeper tension could also result from the <u>different ideological orientations of the two</u>, as indicated in J. Flowerdew's (2000a) study of a Hong Kong scholar's publication process and B. Morgan's (1997) report of his own publication experience. (application) (M1)	tension between ideological orientations between researchers and gatekeepers.
Since gatekeepers have to make judgements on the basis of their own research background and expertise, they could also impose their allegiances and presumptions in the revision process. (M1)	
Authors' attitude to this could be more or less strongly <u>accommodationist</u> in their desire to get published (Berkenkotter & Huckin, 1995; J. Flowerdew, 2000a); or, where the gatekeepers' criticisms point to the rejection of a manuscript, the negotiation between gatekeepers and authors could	tension between responding in an accommodationist or in resisting manner to the gatekeeper's own research allegiances and presumptions

take the form of <u>resistance</u> on the part of the latter (Gosden, 2001; G. Myers, 1985). (application) (M1)	Each of the application citations used contribute to building the landscape of one of the issues investigated in the writer's study on writing for publication among doctoral students in science in China.
Research objective (no RQ provided) To understand various issues Chinese doctoral students in science face in writing for publication. (paraphrased from EX2Bs thesis introduction)	Claim of significance: to justify the need to study various issues faced by Chinese doctoral students in science writing for publication

NE1C's less effective use of application citations to show how a proposed approach can achieve their research goal

Excerpt 6.6 *[NE1C]*	**Annotation** Application citations not used effectively to introduce approach to be used to answer the writer's research question on novice writers experience as research writers
Learning to write research papers -	
To study the writing experience, the student's voice can be taken into consideration and the students' roles of being novice writers and researchers in the university will <u>allow researchers 'inside students' learning'</u> (Sommers & Saltz, 2004, p. 146) <u>experience</u>. (application) (M3)	Citation applied to imply that studying voice provides a means to study novices learning experience of writing.
Bartholomae (2011) reflects on his earlier work and comments that he looks forward to research 'with the student writing in the centre' (p.280) (M3)	
This involves <u>analysing both the writer's experience as well as the text produced by writers</u>. (application) (M3)	Citation from research on student writing in the centre is applied to imply an analysis to study writing experience involves both experience and texts produced by writers. The writer does not show a direct relationship between the study of voice and the analysis of texts and experiences of writing at the centre.
The present study has the potential to enable writing instructors (such myself) to '<u>teach students to explore and define their own problems,</u> even within the constraints of an assignment, (in order to) …help them to create inspiration	Citation implies an application that suggests the study of voice can benefit students with writing problems.

instead of wait for it' (Flower & Hayes, 1980, p. 32). (application) (M3)	The writer does not make explicit how the study of voice can achieve the potential outcome of helping students with their writing problems.
It may also help instructors to address the difficulties students face when writing their papers. (M3)	
1.5 Research questions How do novice writers describe their experience as research writers?	Research aim: to study novice writers experience of research papers

Table 6.3 Differences in the selection and use of citations in EX and NE texts

Citation Type	EX Texts	NE Texts
Attribution	Effective selection and use because information from sources was used purposefully to display knowledge and to build a relevant research territory for the study proposed in the introduction	Ineffective selection and use because information from sources was used to display knowledge which did not relate to the study proposed in the introduction
Evaluation	Effective selection and use because evaluative citations were used effectively to legitimize the writer's proposed study	Ineffective selection and use because evaluative citations were used to legitimize the writer's study but what was legitimized was not in alignment with how the writer planned to approach their study
Application	Effective selection and use because sources from the literature were used applied effectively to build a research territory for an issue related to the writers proposed research.	Ineffective selection and use because the relationship between the sources selected to show how the writer intended to approach their research problem and the research problem was not explicitly made to show how the citations applied to the writer's study.

Chapter 7

EX1A's appropriate use of hedging

Excerpt 7.1 *[EX1A]*
1.2 Background and problem
Academic criticism, broadly (hedge) defined as the linguistic expression of negative evaluation or disagreement (Stotesbury, 2006; Giannoni, 2005; Holmes, 2009), is a central feature of sound academic argumentation. (M1)
Most (hedge) genres of writing at higher levels of education require students to enact evaluation "to convey an attitude to both those they address and the material they discuss" (Hyland & Diani, 2009, p.5) as they assert and maintain a position on an issue. (M1)
Research question
What evaluative meanings characterise successful enactments of academic criticism?

NE1C's use of hedging that only contributes to the local argument (the research territory)

Excerpt 7.2 *[NE1C]*
1.3 Rationale for the study
Task prompts- Writers' understanding of task prompts and task expectations are likely (hedge) to affect the manner in which the research is carried out and how the research paper is written up. (M1)
For example, students' interpretation of the expected genre of the research paper might be (hedge) different from the requirements of the task prompts. (M1)
Research question
What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements?

EX1A's appropriate avoidance of hedging

Excerpt 7.3 *[EX1A]*
1.1 Introduction
Academic criticism, the expression of a discrepancy in stance between the author's position in an essay and the opposing view, is (unhedged claim) a genre practice characteristic of argumentative writing (Cheng, 2006; Holmes, 2009; Hunston, 1993). (M1)
The centrality of academic criticism in the argumentative genre is (unhedged claim) well acknowledged (e.g., Hunston, 2005; Salager-Meyer & Zambrano, 2001; Stotesbury, 2006). (M1)
Research question
What evaluative meanings characterise successful enactments of academic criticism?

NE1D's lack of hedging

Excerpt 7.4 [NE1D]
1.1 Research background

Although it upholds (unhedged claim) a non-English speaking culture, it places (unhedged claims) a heavy demand upon postgraduate education which is expected to approximate the standards that are found in Britain in terms of English medium instruction, dissertation writing and other academic research. (M1)
Research question
What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section? Why do they have these problems.

NE1D's effective but relatively high use of boosting

Excerpt 7.5 *[NE1D]*
1.1 Research background
Research on the Discussion & Conclusion section is still (booster) limited compared to that of the Introduction and even (booster) scarce in the case of thesis writing genre for social sciences. (M2)
As far as thesis genre is concerned, even (booster) fewer studies have ever probed into this particular part-genre. (M2)
Much (booster) less attention has been given to it from the process perspective or to how this part-genre can be related to the opening Introduction chapter. (M2)
Research question
What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section?

EX1A' effective use of attitude

Excerpt 7.6 *[EX1A]*
1.1 Introduction
As higher levels of education (e.g., post-secondary and beyond) increasingly (attitude) employ the argumentative essay as a tool for evaluating students' achievement, the ability to gain control or mastery of the genre practice of academic criticism can have important (attitude) implications for students' academic progress and success. (M1)
Research question
What evaluative meanings characterise successful enactments of academic criticism?

NE1D's effective but relatively high use of attitude

Excerpt 7.7 *[NE1D]*
1.1 Research background
The second concern can be embodied by a brief overview of the limitations of the previous studies on relevant research writing. (M2)
Although a growing (attitude) body of studies have examined various aspects of research articles (RAs) such as Abstract, Introduction, Literature Review, Results in the past two decades, an overwhelming (attitude) majority of the them are directed towards Introduction (e.g., Anthony,1999; Holmes, 1997; Ozturk, 2006; Samraj, 2002; Swales, 1981, 1990, 2004) and predominantly (attitude) deal with the texts produced in natural sciences.(M2)

Research on the Discussion & Conclusion section is still (booster) limited compared to that of the Introduction and even (booster) scarce in the case of thesis writing genre for social sciences. (M2)
Research question
What are some of the significant problems for L2 Chinese doctoral students of social sciences in composing the Discussion & Conclusion section?

EX2A's effective use of personal intrusion

Excerpt 7.8 *[EX2A]*
1.1 Background and Problem to the Study
In addition, teachers need to be very conscious that one "key to successful commenting is to have what is said in the comments and what is done in the classroom mutually reinforce and enrich each other" (Sommers, 1982, p.155). (M1)
Based on my (self-mention) observation of current practice of several teachers at the JC level, well-intentioned teachers in evaluating students' writing feel the responsibility to respond to student errors both in reasoning and expression, and to correct high frequency errors although these different areas have not been examined and discussed at length in previous lessons….(M1)
However, what is taught and emphasised in the previous lesson was not very adequately reinforced in the comments….(M2)
Little empirical research seems to have been done on students' ability to interpret and act on given teacher comments as intended by the teacher, in addition to problems that may hamper their efforts to make use of written teacher feedback to improve the quality of arguments. (M2)
Research question
Are students of average proficiency in English able to interpret written teacher comments in the same sense as intended by the teacher?

NE1C's use of personal intrusion demarcates their study but does not contribute to the macro argument

Excerpt 7.9 [NE1C]
1.1 Context of the study
Even in their second year, however, the students in my (self-mention) study did not fit the conventional description of a student in a freshman composition class… (M3)
However, given that learning to write academic papers is dependent on the writer's sense of belonging to the community, and given that the students in my (self-mention) study were themselves becoming members of the university, I (self-mention) felt justified in drawing on some aspects of socialization theory to explain the writer's role in negotiating the complex nature of the text. (M3)
Indeed, this was deemed essential to my (self-mention) study because in order to make an informed assessment of the text, it was important to find out the meaning attached to it by the writers themselves. The exact nature of which was unspecified at the time.(M3)

This made it difficult to analyze the texts in my(self-mention) study on the basis of the conventions and norms of any one particular discipline….(M3)
The broad areas of research suggested in the task prompts examined in my (self-mention) study allowed students to explore Bhatia's (1993) suggestion that novices read texts written by experts in a number of different fields and become aware of the conventions and norms of academic writing across disciplines…(M3)
Thus prior to examining the discourse organizational structures in the novices' writing, I deem (self-mention) it proper to examine the various types of discourse structures that are used by expert writers. (See Chapter 3.) (M3)
Research question What do research project <u>task prompts</u> require of novice writers? What do novice writers understand of these requirements? May need to add question on research writing

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