

Ian Bruce

*Faculty of Arts and Social Sciences
University of Waikato, New Zealand
ian.bruce@waikato.ac.nz*

THE TEXTUAL EXPRESSION OF CRITICAL THINKING IN PHD DISCUSSIONS IN APPLIED LINGUISTICS

Abstract

The purpose of this study was to identify the textual resources used to express critical thinking in the Discussion chapters or chapter sections of PhD theses from the discipline of Applied Linguistics. Five Discussions were manually analysed using the social genre/cognitive genre model of the author (Bruce, 2008a) as the analytical framework. Three generic elements, used integratively, were found to express critical evaluations as part of constructing an overall argument in the Discussion chapters examined. The first element was the recursive use of an organizing content schema (move pattern), described as: *Point, Support, Evaluation*. The second was the use of key coherence relations to make critical statements in the 'Evaluation' part of this content schema. The third element was the embedding within the critical statements of the metadiscourse devices of *hedging* and *attitude markers* (Hyland, 2005). While not providing a prescriptive approach to expressing critical evaluation in this genre, the findings offer an analytical lens through which novice writers may examine and develop awareness of the types of textual resource used to develop this important element of Discussions.

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Key words

discussion chapter, critical thinking, content schema, critical statements, metadiscourse, genre.

* Corresponding address: Ian Bruce, Faculty of Arts and Social Sciences, University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand.

Sažetak

Cilj ovog rada je identifikacija tekstualnih sredstava za izražavanje kritičkog mišljenja u odeljku *Diskusija* doktorskih teza iz oblasti primenjene lingvistike. Pet primera *Diskusija* manuelno je analizirano na osnovu modela društvenog žanra/kognitivnog žanra (Bruce, 2008a) kao analitičkog okvira. Pronađeno je da tri žanrovska elementa, upotrebljena integrativno, izražavaju kritičku evaluaciju kao sastavni deo konstruisanja opšteg argumenta u analiziranim odeljcima *Diskusija*. Prvi element odnosi se na rekurzivno korišćenje sheme za organizovanje sadržaja (etapnog obrasca), i to *stav, potkrepljivanje, evaluacija*. Drugi je korišćenje ključnih odnosa koherentnosti za izražavanje kritičkih tvrdnji u etapi *evaluacija* unutar sheme sadržaja. Treći element je umetanje metadiskursnih sredstava poput *markera autorskog ograđivanja i izražavanja stava* (Hyland, 2005) u kritičke tvrdnje. Premda ne pružaju preskriptivni pristup izražavanju kritičke evaluacije u ovom žanru, rezultati nude analitičku prizmu kroz koju neiskusni autori mogu da istraže i razviju svest o vrstama tekstualnih resursa pomoću kojih se gradi ovaj važan element odeljka *Diskusija*.

Ključne reči

odeljak *Diskusija*, kritičko mišljenje, shema organizacije sadržaja, kritičke tvrdnje, žanr.

1. INTRODUCTION

This article reports a study that examines the textual expression of critical thinking in five PhD Discussion chapters from the field of Applied Linguistics. The term critical thinking itself arouses multiple expectations and has multiple definitions arising from different philosophical and scientific traditions. As result, there is currently no common source or canon of knowledge that informs either its definition or its teaching (see Brookfield, 2012; Davies & Barnett, 2015). In the second half of the 20th century, both philosophers of science and linguists emphasised the situatedness of the creation and communication of knowledge, acknowledging the influences of historical, cultural, social and institutional contexts on both the methods of scientific research and the classification and constitution of texts. Reflecting this view of the context-specific nature of knowledge and how it is critiqued, Atkinson (1997) argues for *critical thinking as social practice*, as an organic part of a particular academic culture that differs according to the ontology and epistemology of each discipline. Taking this view, the ability to exercise critical thinking appropriately within a particular discipline

is tacitly acquired through acculturation into the research methods, values, practices and texts of that discipline. Drawing on these ideas, I define critical thinking here as *an evaluative judgement made within any field of human activity about some aspect, object or behaviour of that field according to that "field's accepted standards of judgement"* (Swales & Feak, 2012: 228). However, it must be emphasised that the underlying bases for the standards of judgement of different disciplines are not the focus here. Rather this study examines the linguistic trace of this discourse process; that is, identifying the textual means used to express critical thinking in PhD Discussions.

My motivations for undertaking this study are three-fold. First, I am a supervisor (and sometime examiner) of Applied Linguistics PhD theses and most of my own supervisees are L2 writers. Therefore, I have begun here by exploring Discussions in my own disciplinary area in order to inform my own advising practice and as a basis for possible future research of the genre in other disciplines. Secondly, based on anecdotal evidence, it seems that many PhD examiners report weaknesses in the Discussion chapter. Thirdly, previous research has tended to focus on the related genres of research article (RA) and MA discussions, but less work has been done on Discussions in PhDs, possibly because of the size of the texts involved.

In this section, I first consider the requirements of, and writer issues relating to the PhD Discussion chapter. I then review research that has examined actual Discussion writing. This is followed by a brief review of other research approaches to identifying the textual expression of critical thinking, which leads to my rationale for the use of a genre-based approach in the present study.

1.1. The Discussion chapter: Argumentation and critical thinking

The importance of expressing critical thinking in the Discussion chapter is emphasised in most books that provide advice about thesis/dissertation¹ writing (e.g. Bitchener, 2009; Cone & Foster, 1993; Evans, Gruba, & Zobel, 2011; Rudestam & Newton, 2007). In these books, there seems to be general agreement that the Discussion chapter will perform a critically evaluative function in relation to the overall findings of the study being reported in terms of how they answer the research question and how they relate to relevant, previously-published research and theory in the same field. Similarly, it seems that university faculty also agree that the Discussion chapter should incorporate a strong element of critical evaluation. This view emerges from interviews with university faculty in the case studies by Bitchener and Basturkmen (2006) and the findings from a focus group study by Lovitts (2007).

¹ It is acknowledged that the PhD may be referred to as a 'dissertation' in North American English and a 'thesis' in British English. In the context of this study, the term 'thesis' is used.

However, a number of surveys of doctoral students and faculty involved in doctoral supervision suggest that, for those who are relatively new to the requirements of research writing, and especially for L2 writers of English, developing the Discussion section in research articles and Discussion chapters in theses or dissertations presents particular problems. For example, Shaw (1991) found that L2 writers of PhD dissertations in English identified the Discussion chapter as the most difficult as it was the least supported type of writing although they expected examiners to give it most attention. Other studies involving surveys of thesis/dissertation supervisors and students suggest that L2 writers have particular problems with developing and sustaining coherent ideas and arguments in the Discussion chapter, in particular, in presenting an appropriate, critical evaluation of their findings in relation to the disciplinary literature (Allison, Cooley, Lewkowicz, & Nunan, 1998; Cooley & Lewkowicz, 1995, 1997; Dong, 1998; Thompson, 1999). In their case studies, Bitchener and Basturkmen (2006) found that the L2 student writers' problems with the Discussion chapter related partly to their incomplete understanding of the function of this chapter, and in particular the need to interpret and critically discuss their findings. Some of the faculty in Lovitts's (2007) focus group study felt that the "discussion/conclusion chapter was a difficult one for graduate students to write, in part, because at this point in their careers most student have an insufficient perspective on the field to really draw things together and address their implications" (2007: 47).

Thus, while the advice literature and university faculty surveyed appear to share similar expectations of the PhD Discussion chapter, including an emphasis on argument construction supported by the expression of critical thinking, research in this area suggests that novice and L2 research writers find this to be a difficult genre to master, and that their difficulties often seem to relate to formulating appropriate evaluations of the findings and relating these back to previous research in the field.

1.2. Previous research on Discussion chapters

In previous ESP studies that have investigated Discussion chapters in theses and dissertations (and Discussion sections in research articles) over several decades, it appears that the principal focus has been on attempts to understand their organization in terms of rhetorically motivated 'moves', such as Swales (1990, 2011) proposed for research article Introduction sections. A seminal work frequently referred to is Hopkins and Dudley-Evans's (1988) study that examined Discussion chapters in MSc dissertations in the field of biology and discussion sections in research articles in the field of irrigation and drainage, where they found a "cycling" or recursive patterns of involving eleven moves. They found that there was really only "one obligatory move, *statement of result*, which occurred several times, almost always at the head of a cycle" (1988: 117). Their principal

conclusion about the arrangement of these cycles or recursive patterns in the Discussion chapter was that they relate centrally to the interpretation of the results by the writer. In a further study of the evaluation of a Discussion chapter of a thesis in biology, Dudley-Evans (1994: 225) reduced slightly the original eleven-move structure to nine moves.

Yang and Allison (2003) examined the smaller, related genre of Discussion sections of twenty RAs in Applied Linguistics, and reduced Hopkins and Dudley-Evans's (1988) eleven moves to a seven-move structure, some of which contain subsidiary steps. Basturkmen (2009), when examining MA dissertation Discussion chapters and RA discussion sections in the field of language teaching, further condenses Yang and Allison's proposed seven-move structure to four moves with three subsidiary steps relating to commenting on results; the moves are *background information*, *summarizing results*, *reporting a result*, *commenting on the result* by (a) 'explaining' the results, (b) 'comparing with results in the literature', and (c) 'evaluating' the result. She found a considerable degree of recursion in the use of the Moves 3 and 4 – reporting results, commenting on results – which she described as “Result-Comment” sequences.

Overall, it seems that ESP research has tended to focus mostly on establishing patterns for the organization of Discussion chapters in terms of rhetorically motivated moves. Despite some variation in the functions and ordering of moves, 'presenting' and 'commenting on' the research findings are central elements, and moves that perform these functions operate recursively. More recent ESP studies of PhD theses in the fields of the visual and performing arts, using both textual and ethnographic analysis, have revealed a variety of overall thesis macrostructures, including some theses that still contain “chapters that describe and/or critique and theorise the author-artists creative work, where the conventional elements 'Results' and 'Discussion' are intermingled” (Paltridge, Starfield, Ravelli, & Tuckwell, 2012: 399). Yet, beyond a focus on the internal organization of Discussion or its place in the wider thesis, there has been little research that has examined the specific textual elements and devices employed to express critical thinking as it contributes to the construction of argumentation in this genre.

While not discounting the roles of moves and their related lexical items, to achieve my research purpose, I undertook a somewhat more holistic exploration of the textual expression of critical thinking in PhD Discussion chapters/sections using a multi-variable genre model (see Section 2.2). My reasoning was that the expression of this important element needs to be examined *within the functioning discursive and textual whole* that constitutes the genre of the Discussion chapter. Employing this genre model as an analytical tool to identify different types of knowledge that shape elements of a particular category of text is justified in terms of Bhatia's (2002, 2004) proposal that discourse includes social practice, genre and text.

The research question explored was: What are the textual means used by writers to express critical thinking in the Discussion chapters of PhD theses in Applied Linguistics?

2. METHODOLOGY

2.1. The sample

The sample for this study comprised the Discussion chapters from five PhD theses produced by graduates of New Zealand universities: three from the University of Auckland, one from Victoria University of Wellington, and one from Massey University. Each thesis was an annual winner of a 'Best Thesis Competition' organised by the *Applied Linguistics Association of New Zealand* for the years 2009 to 2013. Theses entered in this competition are judged by a panel from this association, and each year one is selected as best thesis. My principal reason for selecting chapters from theses that were annual winners of this competition for the sample of this study was in order to address the "variability of quality issues" in PhD theses that Thompson (2012: 120) identifies, with the review of each thesis by a panel of applied linguists providing a validating judgement additional to its original examination. As Thompson points out, in countries that follow the British university system, PhD theses tend not to be graded in terms of their comparative quality as they are judged on pass/fail criteria. It would, therefore, be logistically difficult to identify a comparative sample of lower-quality PhD theses as the examination system does not disclose this type of information. Although the theses were by both L1 and L2 writers, their selection as competition winners was the sole criterion for their inclusion in the sample. Bibliographic and methodological details about each thesis and page numbers and word counts of the analysed sections are provided in Appendix A.

Specifically, I identified the sections of each thesis that discussed the findings of the research. In three cases this involved a Discussion chapter, in one case a chapter termed Conclusions and in one case the Discussion sections of five chapters that reported five different research investigations. Altogether the sample consisted of 145 pages of text (approximately 57,000 words). In relation to the ethical requirements of the research, the purpose of the study was explained to each of the thesis writers, and their written consent was obtained to quote material from their thesis.

2.2. The genre model

The analytical framework that I employed in this study is the social genre/cognitive genre model that I have previously proposed (Bruce, 2008a). The model is based on two principles from categorization theory in cognitive psychology. The first principle is that complex categories (in this case, genres as complex textual categories) are formed in response to different types of intention or purpose (Barsalou, 1983; Murphy & Medin, 1985). Here different types of purpose relate to the social genre and cognitive genre elements of the model.

Social genre – refers to socially recognized constructs according to which whole texts are classified in terms of their *overall social purpose*. [...] Purpose here is taken to mean the intention to communicate consciously a body of knowledge related to a certain context to a certain target audience.

Cognitive genre – refers to the overall cognitive orientation and internal organization of a segment of writing that realizes a single, *more general rhetorical purpose* [such as] to recount a sequence of events, to explain a process, to present an argument. (Bruce, 2008b: 39)

Social genres are conventionally recognised categories of whole texts that occur in particular contexts for certain audiences, and sometimes involve formulaic patterns in the selection and staging of content. Cognitive genres, so called because they describe the use of more abstract, procedural knowledge, are each instantiated by a particular general, rhetorical purpose (e.g. argue, explain) that influences the micro-level organization of the text, relationships between propositions and linguistic choices relating to cohesion and coherence. Although a specific example of a particular social genre may exhibit features of a single cognitive genre (e.g. an instruction manual will use Explanation, probably recursively), it is more common for examples of social genres to exhibit features of more than one cognitive genre. For example, a personal letter (a social genre) may draw upon a range of different cognitive genres in relation to the different communicative purposes that may characterise the different sections of the overall message as it unfolds (e.g. recounting a series of events, providing an explanation, presenting an argument).

The second principle from categorization theory is that complex categories have a top-down, internal organizational structure (Miller, 1984; Rumelhart & Ortony, 1977). Because of the complexity of discourse creation, the model proposes that writers' choices involve a range of discursive elements that relate to the achievement of different types of social and general rhetorical purpose. Table 1 outlines the different discursive elements of the model (that may influence textual choices) and the subsequent bullet points (summarised from Bruce, 2013) briefly unpack these elements.

social genre elements

- context (Widdowson, 2004)
- epistemology (Lea & Street, 1998)
- stance (Hyland, 2005)
- content schemata (Hasan, 1989; Swales, 1990)

cognitive genre elements

- gestalt patterns of ideas (Johnson, 1987)
 - general textual patterns (Hoey, 1983, 2001)
 - relations between propositions (Crombie, 1985)
-

Table 1. The Social Genre/Cognitive Genre Model

- *Context*: Widdowson (2004: 54) characterises context in terms of schematic knowledge that involves both “intralinguistic and extralinguistic factors”. I suggest that, in relation to academic genres, “extralinguistic factors” involve the specialist, technical knowledge of the field to which the text belongs, and “intralinguistic factors” include the socially-driven forms of communication used in the particular field.
- *Epistemology*: how experts working in a particular field perceive and use knowledge. However, to understand how subject experts view knowledge, a necessary co-condition is to understand how they create and validate (or prove) knowledge – the knowledge-creating paradigms used strongly influence its knowledge-communicating forms, such as its written and spoken genres.
- *Stance*: writer stance relates to the use of the set of ten language devices which Hyland (2005: 49) groups together under the term of *metadiscourse*, devices such as *hedges*, *boosters* and *transitions*. Hyland claims that these are used to make the propositional content of a text “coherent, intelligible and persuasive to a particular audience” (2005: 39).
- *Content schemata*: these are regularly-occurring, conventionalised patterns that may be used in organizing the content of a social genre, each stage of which fulfils a particular communicative or rhetorical purpose. The approach to genre influenced by Systemic Functional Linguistics describes such patterns as *schematic structures* (Eggins, 1994) or *functional stages* (Hasan, 1989), and the English for Specific Purposes approach describes them as *moves* and *steps* (Swales, 1990). The rhetorical purpose that gives rise to a particular ‘stage’ or ‘move’ may relate quite closely to disciplinary content of the text, such as in Bhatia’s (1993) analysis of legal cases (e.g. *establishing the facts of the case*, *arguing the case*) or may be described in less content-specific terms, such as in Connor and Maurenan’s (1999) analysis of grant proposals (e.g. *territory*, *gap*, *goal*, *means*). However, the type of context- and content-related rhetorical purpose that motivates these stages (or ‘moves’) differs from the more general types of rhetorical purpose (e.g. *argue*, *explain*) that instantiate the cognitive genre elements of the model; these are described under the next point.

- *Cognitive genres* refer to segments of writing that aim to achieve one particular, general rhetorical purpose, such as to argue, explain or recount. Such segments of writing are sometimes called *text types* and described in terms of linguistic features (see, for example, Biber, 1989). However, in this model, they are conceptualised in terms of a top-down, internal organizational structure that involves:
 - gestalts called *image schemata* (Johnson, 1987) that reflect the higher-level organisation of ideas (e.g. WHOLE PART, UP DOWN, LINK);
 - *discourse patterns* (Hoey, 1983, 2001) that relate to the organization of smaller sections of the actual written text (e.g. *Problem Solution*); and,
 - *interpropositional relations* (Crombie, 1985) that account for lower-level, more specific, binary coherence relations, e.g. Reason Result, Condition Consequence, Means Purpose, Concession Contraexpectation.

As stated at the end of Section 1.2, the rationale for framing the analysis in terms of this multi-layered model arises from the need to acknowledge the complexity and multi-faceted nature of an extended text, such as a PhD Discussion. The social genre/cognitive genre model employed here aims to operationalise underlying constructs relating to genre and text. Specifically, in this study the texts are examined to identify those elements (in terms of the model) specifically used to express critical thinking as it is defined in Section 1 through text.

2.3. The analysis

The analysis first involved reading the whole of each thesis as preparation for a closer study of the Discussion chapter/sections of each thesis. This was followed by close readings and marking up of the Discussion sections/chapters of the five theses in terms of salient elements that related to the expression of critical thinking, drawing upon the genre model outlined in Table 1. In relation to the higher-level element of the model of attempting to identify a content schema (move structure) to account for larger organizational structures in the writing, the analysis was more inductive, involving constant comparison and reanalysis of each chapter in order to settle on the most appropriate descriptive categories for the rhetorically motivated stages (moves) that characterised its content organization. However, the analysis of lower level elements was more deductive. For example, in relation to stance, this involved the use of Hyland's (2005: 49) metadiscourse model and, in accounting for coherence relations, Crombie's (1985) taxonomy of interpropositional relations was employed.

3. RESULTS

The overall findings were that three key elements from both the social and cognitive genre parts of the model emerged as central to the expression of critical thinking as part of the development of the overall argument of the Discussion chapters:

1. In terms of the organization of content within each of the five theses, a recursive content schema (move structure) emerged as a key evaluation-framing element, described as *Point, Support, Evaluation*. 'Point' and 'Support' appear to be fixed elements while 'Evaluation' occurs in 58% of the identified instances of the schema in the sample (see Table 2).
2. In the 'Evaluation' part of this schema, key coherence relations were used to make critical statements; these were operationalised in terms of Crombie's (1985) taxonomy of *interpropositional* relations (see Appendix B). Specifically, a small number of these relations were employed across the five theses to make these key critical statements.
3. At a lower level, within the critical statements, two elements of Hyland's (2005) metadiscourse model were also employed to help express critical thinking – specifically: *hedging* and *attitude markers*.

While clearly other elements of the genre model were employed in these Discussion chapters, such as stretches of text realizing particular cognitive genres or the use of metadiscourse devices other than those identified in the findings, the focus here is solely on those elements of the genre model directly related to the research purpose of the study. Section 3.1 will explain and exemplify the content schema with examples from the Discussion chapters. Section 3.2 will focus on the critical statements in the Evaluation, and Section 3.3 will report the use of metadiscourse within these critical statements.

3.1. Content schema

Each Discussion chapter began with an introductory overview that mapped the content of the chapter for the reader, following which it was divided into numbered sections. In three theses, these numbered sections also began with further metatextual mapping and concluded with a summary of the key points at the end of the section. However, in relation to the research purpose of the present study, it was *the intra-sectional* use of a particular recursive *content schema* (see Section 2.2) described as *Point, Support, Evaluation* that accounted for the internal organization of the rest of the chapter sections, that helped construct the case being presented, and provided a framework for the expression of critical thinking.

3.1.1. Point

Point tended to be a brief statement at the beginning of the content schema. The point was the textual element about which the evaluative judgement was subsequently formed in the following *Support* and *Evaluation* stages of the schema.

Among the Points in the sample, 52% were a deduction based on a finding(s), 36% were a statement of an actual empirical finding, and 12% were more general claims or statements related to the research. Because the Point stage was realised by writers in these different ways, I did not employ the more general *Reporting a Result* label used by Basturkmen (2009) for the reason that the majority of the points were not actual empirical findings. The Point usually consisted of one or two sentences and in only a few cases involved a paragraph. The following are three examples of 'Points':

(1a) The results from Study 2 demonstrate incidental learning of vocabulary does occur through watching television. (Rogers, 2013, p. 97) – a deduction

(2a) An important finding was that short turns were frequent and dominant as an exchange pattern across the 10 CMC groups. (Nguyen, 2011, p. 222) – an empirical finding

(3a) Methodologically, this study has also contributed to the validation of a classroom observation scheme of WTC behaviour in class. (Cao, 2009, p. 229) – a more general claim

3.1.2. Support

The *Support* stage of the content schema immediately follows the Point and is the most extensive stage. The findings showed that the Support develops the point in three possible ways, by:

- *exemplification* – which involved presenting examples from the data of the study to illustrate and provide evidence for the point;
- *explanation* – which involved interpreting or explaining the point; or,
- *comparison* – which involved comparing the point with the findings or conclusion from other referenced research or theory.

The majority of the Support stages in the five theses use *only one* of these three realizations. However, in four of the five theses a minority of the Support stages combine two realizations to support the point. The most common of the combinations were 'exemplification/comparison' followed by 'comparison/explanation'.

Combinations of two realizations are found in 34% of Roger's Supports; 18% of those of Nguyen, 14% of those of Booth and 13% of those of Jones.

The following are examples of each of the three possible ways of realizing the Support stage. The first example is part of the Support following Point 1a (above), which uses exemplification; that is, providing data from the study as evidence for the assertion made in the Point.

(1b) Participants had mean vocabulary gains of 6.4 words on the Tough Test and 6.8 words on the sensitive test through viewing 10 successive episodes of Chuck. The Experimental Group's gains from the pre- to post-test were significantly greater than those of the control group..." (Rogers, 2013, p. 97)

The second Support example is one that develops its preceding point by explanation. This is the beginning of the Support that follows Point 2a above.

(2b) There are several explanations for these short turns made by the CMC students. It took most of them, with limited typing skills, so long to type a full idea while at the same time they wanted to maintain the conversation and to get their ideas across, which in turn tempted them to hurriedly enter a turn even though it was not a complete idea. An idea therefore, needed several turns to transfer its complete meaning during which it could be unfortunately interrupted by turns from other members... (Nguyen, 2011, p. 222)

The third example of a Support involves comparison. This type compares the assertion made in the Point in terms of how it is similar to, or differs from other research. For example, the following Comment, which uses comparison, is that which follows Point 3a above.

(3b) Observation was considered more suitable for measuring situational WTC (MacIntyre et al., 2001) and a number of previous studies attempted to operationalise WTC in an L2 classroom in slightly different categories (Cao and Philp, 2006; Pattapong, in press, Peng, 2008) (Cao, 2009, pp. 229)

3.1.3. Evaluation

The *Evaluation* stage, which occurs in 59% of the instances of the schema, involves writers expressing their own particular viewpoint about the material presented in the Point and Comment stages. Other ESP researchers (Basturkmen, 2009; Yang & Allison, 2003) make evaluation an optional step within the previous move. I propose it to be a separate move because it involves a more personal, critical type of writing. The difference between Support and Evaluation is similar to Sinclair's (1988) distinction between *attribution* and *averral*; the Support may provide further detail relevant to, or other writers' views on the point, whereas the Evaluation is a more direct expression of the writer's own position, and usually employs particular coherence relations (Knott & Sanders, 1998) to make critical

statements. These relations are operationalised by Crombie's (1985) taxonomy of binary *interpropositional* relations. Embedded within these relations were the metadiscourse elements of *hedging* and *attitude markers* (Hyland, 2005). The types of relation and their frequency are discussed in Section 3.2 following, and the use of metadiscourse is dealt with in Section 3.3.

The following three Evaluation examples are those that follow the three Supports of the previous sub-section. The first Evaluation example relates to Point 1a and Support 1b above.

(1c) It is difficult to make direct comparisons between the mean gains from the results of Study 2 and previous research because of the differing number of test items and different treatments in the studies. The overarching finding from this research and previous research, however, is that vocabulary can be incidentally learned from viewing videos. (Rogers, 2013, p. 98)

The second Evaluation example is the third part of the content schema relating to Point 2a and Support 2b above.

(2c) Above all, this text-only method of exchange, in which the priorities were to quickly get ideas across and to smoothly maintain the conversation, also partly explains the reason why the CMC students tended to key in fewer words in each turn. It is concluded in this study that limited computer knowledge and typing skills affected the quantity and quality of the conversation. (Nguyen, 2011, pp. 222-223)

The third Evaluation example relates to Point 3a and Support 3b above.

(3c) This study modified the scheme of Cao and Philp (2006), contributing to the development of a more refined observational scheme for future classroom WTC studies. (Cao, 2009, p. 229)

Table 2 provides the frequencies of occurrence of the full Point, Support, Evaluation schema and those instances that omitted the Evaluation stage.

THESIS	POINT, SUPPORT, EVALUATION	POINT, SUPPORT (NO EVALUATION)	SCHEMATA TOTAL	CHAPTER LENGTH, WORD TOTAL
Cao (2009)	11	6	17	4,326
Jones (2010)	11	12	23	8,528
Nguyen (2011)	22	17	39	10,788 approx.
Booth (2012)	23	23	46	18,521
Rogers (2013)	26	8	34	15,200 approx.
Total	93	66	159	57,363
Percentages	58%	42%	100%	

Table 2. Frequencies of use of the schema 'Point Support Evaluation'

3.2. Use of key coherence relations as critical statements in the Evaluation section

Within the third part of the content schema (the Evaluation), a central and confirmatory element in the expression of critical thinking was the use of key coherence relations to frame critical statements; these emerged as the most overt and direct expression of the writer’s own position. Across the five theses, 174 such critical statements were identified. These statements are analysed in terms of Crombie’s (1985) taxonomy of binary interpropositional relations. It was found that a small group of these relations was employed to express evaluative judgements in relation to three aspects of the thesis: the research questions or research gap (the overall object or focus of the research), interpretation of the findings, and comparison of the findings with other research. Table 3 shows the actual numbers and percentage frequencies of the relations that frame the critical statements identified in the sample. Some Evaluations contained more than one critical statement.

THESIS	EVALUATION CRITICAL STATEMENTS: TOTALS	REASON RESULT	CONCESSION CONTRA-EXPECTATION	GROUND'S CONCLUSION	MEANS RESULT	AMPLIFICATION	CONDITION CONSEQUENCE	OTHER* RELATIONS
CAO (2009)	27	10	3	3	5	3	0	3
JONES (2010)	24	10	5	1	0	2	3	3
NGUYEN (2011)	26	4	3	8	6	1	2	2
BOOTH (2012)	55	7	14	17	3	4	1	9
ROGERS (2013)	42	11	11	5	4	4	6	1
TOTALS	174	42	36	34	18	14	12	18
PERCENTAGES	100%	24%	21%	20%	10%	8%	7%	10%

* This category includes all other relations used across the five theses in the Evaluation part of the schema

Table 3. Coherence relations framing critical statements in the Evaluation

3.2.1. Reason Result

Among the relations employed by the critical statements in the Evaluation section, Reason Result was the most frequently used with 42 occurrences across the five theses. In defining this binary relation between two propositions, Crombie (1985: 20) states: “the reason member (which very often follows the result member in English) gives a reason *why* a particular effect came or will come about”. Signaling of this relation may employ subordinators, prepositions, conjuncts, causative verbs and nouns. The following are examples of Reason Result relations from the five theses.

(1d) “Another reason that the results reported in Study 2 might be considered conservative has to do with the nature of the vocabulary testing procedure.” (Rogers, 2013, p. 98)

(2d) “These findings are noteworthy because they indicate that learners tend to believe they incidentally learn vocabulary through watching television.” (Rogers, 2013, p. 159)

(3d) In summary of the discussion related to Research Question One, the first part of this chapter highlights the high stakes nature of the TOEIC as a result of a complex interplay between the test makers, the test, community stakeholders, and test-takers.” (Booth, 2012, p. 270)

3.2.2. Concession Contraexpectation

The Concession Contraexpectation relation is the second most frequently used relation to frame critical statements that occurred in the Evaluation section of the schema with 36 occurrences, constituting 21% of the total number (of critical statements). Crombie’s (1985: 22) definition of this relation states: “in this relation, the truth of an inference is directly or indirectly denied”. She suggests that this relation may be signaled by subordinators, prepositions or conjuncts (1985: 88). The following are examples of critical/evaluative statements framed by the Concession Contraexpectation from the sample. The underlined words indicate any linguistic signalling of the relation that occurs.

(1e) “Results from Study 1 indicate that vocabulary knowledge is a significant factor in the comprehension of television. Vocabulary knowledge, however, does not appear to play as large a role in the comprehension of authentic television programs as it does for short listening passages.” (Rogers, 2013, p. 58)

(2e) “No doubt, more research is needed to confirm the extent to which TOEIC scores are used by companies and for what purposes. Nonetheless, previous research, supported by student perspectives in the present study, appears to confirm the high stakes status of the Standard TOEIC fuelled by perceived demands from the employment sector.” (Booth, 2012, pp. 256-257)

3.2.3. Grounds Conclusion

The Grounds Conclusion relation is the third most frequently occurring relation framing critical statements in the Evaluation sections with 34 occurrences, constituting 20% of the total number (of critical statements). In defining this binary relation between two propositions, Crombie (1985: 20) states that in this relation “a deduction is drawn on the basis of some observation”. The following are examples of Grounds Conclusion relations framing critical statements:

(1f) “The results from Study 3 also suggest that lexical coverage may not be as important a factor for incidental vocabulary learning from viewing television as it may be for reading.” (Rogers, 2013, p. 133)

(2f) “For the Captions Group, there were small significant correlations between vocabulary knowledge and comprehension for four of the 10 episodes, and for the no Captions Group, there were small to medium significant correlations for all 10 of the episodes. This indicates that greater vocabulary knowledge may be more important for comprehension of television when captions are not present.” (Rogers, 2013, p. 258)

(3f) “After years of preparing for national standardised tests from middle school to university, individuals continue to prepare for tests for employment, and perhaps later for purposes of promotion. The TOEIC, therefore, provides a powerful mediating tool, for encouraging these cultural norms and conventions.” (Booth, 2012, p. 267)

3.3. Metadiscourse devices

The third element involved in the expression of critical thinking were metadiscourse devices found in the majority of the critical statements that occurred in the Evaluation section. In the genre model presented in Section 2.2, metadiscourse devices relate to the element of genre termed ‘stance’. In the critical statements, two were more frequently used: hedges and attitude markers.² Hyland (2005: 52) defines hedges as language devices that “emphasise the subjectivity of a position by allowing information to be presented as an opinion rather than a fact and therefore open that position to negotiation”, and gives the examples of words, such as “might, perhaps, possible, about” (2005: 49). Hyland’s (2005: 53) states that attitude markers “indicate the writer’s affective, rather than epistemic, attitude to propositions [...] [and are] signalled metadiscoursally by attitude verbs (e.g. *agree, prefer*), sentence adverbs (*unfortunately, hopefully*) and adjectives (*appropriate, logical, remarkable*)”. Table 4 following presents the frequencies of use of attitude markers and hedges in the Discussions of the five theses.

THESIS	CRITICAL STATEMENTS IN THE EVALUATION	CONTAINING HEDGING	CONTAINING ATTITUDE MARKERS
Cao (2009)	27	4	10
Jones (2010)	24	5	15
Nguyen (2011)	26	4	12
Booth (2012)	55	33	7
Rogers (2013)	42	42	9

Table 4. Use of hedges and attitude markers in critical statements

² Different metadiscourse devices occurred in other parts of the schema, such as in the Point. However, two are highlighted here because of their particular role in constructing the critical statements in conjunction with the key interpositional relations.

The following are examples of critical statements containing instance of hedging, which are underlined in each example. (It should be noted that some critical statements contained more than one instance of hedging.)

(1g) “While the results from Study 3 indicate that knowing more vocabulary leads to better comprehension, an increase of 1.67% appears not to be large enough to consistently make a significant difference in understanding.” (Rogers, 2013, p. 129)

(2g) “In this way TOEIC scores have perhaps come to provide a measure of the degree by which future workers may be willing to work hard and commit to the interests of the company.” (Booth, 2012, p. 256)

(3g) “In making this decision, it would be prudent of them to consider research findings that have demonstrated that employing the L2 (English) at an early age as the instructional language will not necessarily lead to academic success . . .” (Jones, 2010, p. 262)

The following are examples of critical statements (in Evaluations) containing attitude markers, which are underlined in each example.

(1h) “This is a promising avenue for future research.” (Nguyen, 2011, p. 223)

(2h) “Since there is a strong link between active involvement of stakeholders in decision-making and success of implementation . . . , it is vital that as many stakeholders as possible are involved in the development of goals.” (Jones, 2010, p. 261)

(3h) “This study is distinctive in that it investigates WTC through actual classroom interaction data and it has . . .” (Cao, 2009, p. 228)

4. DISCUSSION

As stated at the outset, the aim of the study was to identify the textual means used by writers to express critical thinking in the Discussion chapters of PhD theses in Applied Linguistics. Five PhD Discussion chapters were examined and the principal findings were that three key elements of the genre model (that framed the analysis) combined to express critical thinking as part of the writer’s extended argument or case. The elements were: the recursive organizing content schema or move structure (Point, Support, Evaluation); the use of certain coherence relations (Reason Result, Concession Contraexpectation, Grounds Conclusion) to frame key critical statements in the Evaluation part of this schema; and, within the critical statements, the use of the metadiscourse devices of attitude markers and hedging (Hyland, 2005). The Point and Support stages of the schema provided the basis or

framework for the more overtly critical, third stage of Evaluation, found in 58% of the occurrences of the schema. In some cases, its absence from the content schema seemed to suggest that writers believed that some points did not need to be confirmed by this critical element, while in other cases, from a reader's perspective, it seemed that there was scope for adding an Evaluation that reflected the author's viewpoint.

However, it must be acknowledged that, because of the nature of the intensive manual analysis undertaken (157 pages of closely analysed, marked-up text), it was only possible to examine chapters from a small number of theses. Also, because it was not logistically possible to fund and train multiple raters to provide comparative analyses, the study can only be considered to be an exploratory use of this particular research approach. Therefore, this was a small-scale study that would need to be followed up by further research involving larger samples and texts from different disciplines.

In relation to previous research that has examined content-structuring 'moves' in Discussion chapters (Section 1.2), the findings of this study are broadly similar; they show a recursive pattern of firstly highlighting some aspect of a finding and then commenting on it in some way. In the PhD Discussion chapters, the communicative purposes of two optional steps of Basturkmen's (2009) Comment move (explaining and comparing) are developed quite extensively in the Support stage, but in most cases using only one of these types of communicative purpose. In addition, in the PhD chapter sample, the Support stage was often realised by a different rhetorical purpose – exemplifying (providing supporting examples from the data) – which was not found in the studies of Yang and Allison (2003) or Basturkmen (2009). Exemplifying, however, was a feature in the MSc Discussion studies of Hopkins and Dudley-Evans (1988) and Dudley-Evans's (1994). In another divergence from previous studies, I have identified Evaluation as a third stage (move) in this schema – unlike Yang and Allison (2003) and Basturkmen (2009) who propose Evaluation as a step within their Commenting on Results move. I have highlighted it is a separate move, differing from the two previous moves, because it involves more personal, critical writing, the analysis of which was a central focus of this study.

The two other elements that integrate with and strengthen the Evaluation are coherence relations that express critical statements and, within them, embedded metadiscourse devices. The critical statements' use of two causal relations (Reason Result and Grounds Conclusion) relates to Parkinson's (2011) study of argumentation in Discussions in lab reports and RAs, where she found markers of "cause," along with "condition and purpose" (2011: 164) to be important elements of arguing and proving knowledge claims. In relation to the use of metadiscourse devices, the use of hedging in research writing has been identified in earlier studies (e.g. Hyland, 1996), and it emerged the most frequently occurring interactional metadiscourse device in a sample of Results and Discussion chapters from English engineering masters theses (Lee & Casal, 2014).

Subject to confirmation by more research in this area involving other disciplines (and larger samples), the findings here may have implications for teaching the writing of the Discussion chapter, which for many writers is a difficult genre. For example, the identified knowledge elements used to express the writers' critical evaluation of their findings may provide a lens through which to examine existing examples of Discussion chapters. The content schema could provide a basis for examining recursion in the content organization, such as stating and developing points. It could be used to identify the types of knowledge that the Point stage consists of (an empirical finding or an argument based on a finding). Writers could consider the different ways of realizing the Support and the reasons for these differences in relation to the type of information presented in the Point. Examples of Evaluations could then be examined in terms of the key coherence relations used and metadiscourse elements, along with the different ways in which these elements may be linguistically encoded. Finally, writers' attention could also be drawn to examples where there is no Evaluation in the schema and the effect of this on the overall argument development.

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IAN BRUCE is a senior lecturer in Applied Linguistics at the University of Waikato, Hamilton, New Zealand. His research and publications relate closely to English for Academic Purposes (EAP) in two areas: the knowledge base for teaching academic writing and EAP teacher training and development. In relation to researching and teaching academic writing, his theoretical approach is outlined in his book *Academic Writing and Genre* (2008, Bloomsbury). In the area of EAP teacher development and praxis, he has co-authored with Alex Ding a recent book entitled *The English for Academic Purposes Practitioner: Operating on the Edge of Academia* (2017, Palgrave).

Appendix 1

Source theses of Discussion chapters

THESIS	REFERENCE	METHODOLOGY/DATA	CHAPTER/NUMBER OF PAGES/NUMBER OF WORDS
1.	Cao, Y. (2009). <i>Understanding the notion of interdependence, and the dynamics of willingness to communicate</i> . PhD Dissertation, The University of Auckland.	multiple case study, qualitative data	Chapter 7, pp. 222-234 (13 pages), 4,326 words
2.	Jones, J. (2010). <i>An ethnographic enquiry into the implementation of the Kenyan Language-in-Education Policy (mother tongue as subject and medium of instruction) in the Sabaot Language Group</i> . PhD Dissertation, The University of Auckland.	ethnography, qualitative data	Chapter 8, pp. 247-269 (23 pages), 8,528 words
3.	Nguyen, L. V. (2011). <i>Computer-mediated collaborative learning in a Vietnamese tertiary EFL context: Process, product and learners' perceptions</i> . PhD Dissertation, Massey University.	multi-method, including quasi-experiment, quantitative and qualitative data	Chapter 9, pp. 220-249 (30 pages), 10,788 words (estimated)
4.	Booth, D. (2012). <i>Exploring the washback of the TOEIC in South Korea</i> . PhD Dissertation, The University of Auckland.	multi-method, quantitative and qualitative data	Chapter 10, pp. 253-297 (45 pages), 18,521 words
5.	Rodgers, M. P. H. (2013). <i>English language learning through viewing television: An investigation of comprehension, incidental vocabulary acquisition, lexical coverage, attitudes and captions</i> . PhD Dissertation, Victoria University of Wellington.	experimental, quantitative data	Chapter 2, Section 2.11 (6 pages), Chapter 3, Section 3.8 (6 pages), Chapter 4, Section 4.9 (8 pages), Chapter 5, Section 5.8 (5 pages), Chapter 6, Section 6.8 (9 pages); 15,232 words (estimated)

Appendix 2
Crombie's interpropositional relations

PROCESS	RELATION	DEFINITION
Associative	Simple Contrast	Involves the comparison of two things, events or abstractions in terms of some particular in respect of which they differ.
	Comparative Similarity (Simple Comparison)	Involves the comparison of two things, events or abstractions in terms of some particular in respect of which they are similar.
	Statement-Affirmation	The truth of a statement is affirmed.
	Statement-Exception	Involves a statement and an exception to that statement.
	Statement-Exemplification	The first member provides a general statement and the second adds a proposition which is presented as an exemplification of the general statement in the first member.
	Statement-Denial	Involves the denial of the truth of a statement or validity of a proposition.
	Denial-Correction	Involves a corrective non-antonymic substitute for a denial.
	Concession-Contraexpectation	Involves direct or indirect denial of the truth of an inference.
	Supplementary Alternation	Involves two or more non-antithetical choices.
	Contrastive Alternation	Involves a choice between antitheses.
	Paraphrase	Involves the same proposition expressed in different ways.
	Amplification	Involves implicit or explicit repetition of the propositional content of one member of the relation in the other, together with a non-contrastive addition to that propositional content.
	Logico-deductive	Condition-Consequence
Means-Purpose		Involves an action that is/was/will be undertaken <i>with the intention of</i> achieving a particular result.
Reason-Result		Involves the provision of a reason <i>why</i> a particular effect came about or will come about.
Means-Result		Involves a statement of <i>how</i> a particular result is/was/will be achieved.
Grounds-Conclusion		Involves a deduction drawn on the basis of an observation.
Temporo-contigial	Chronological Sequence	Provides the semantic link between event propositions one of which follows the other in time.
	Temporal Overlap	The relation of Temporal Overlap links two events which overlap, either wholly or partly, in time.
	Bonding	This is a non-elective, non-sequential relation between two conjoined or juxtaposed propositions. The second member adds at least one new proposition to the first and the members are not connected in an elective, comparative or sequential way.