Metadiscourse in Research Articles: A Comparative Study across Disciplines and Research Paradigms

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SUMMARY

Research into academic writing has shown that discourse conventions are shaped by a variety of complex socio-cultural factors. As part of discourse conventions, metadiscourse in academic writing is found to be affected by the knowledge-making practices of different disciplinary fields. While writers from the natural sciences and the humanities differ in their use of metadiscourse, it is largely unclear whether those writers from individual disciplines within the social sciences may show any variability in this interpersonal dimension. In addition, due to the importance of research paradigms in knowledge creation and representation, it is expected that a particular research paradigm and its associated epistemological assumptions may exert influences on the academic discourse in reporting research in that paradigm. This study has set out to investigate whether and how the use of metadiscourse in quantitative, qualitative, and mixed methods research articles (RAs) may vary across the three social science disciplines of applied linguistics, education and psychology.

The study adopts a mixed methods design and combines a primary corpus-based analysis with a complementary semi-structured interview study. The corpus was comprised of the post-method sections of 180 published RAs sampled from a number of internationally prestigious journals in applied linguistics, education, and psychology. Using an analytical framework adapted from Hyland's (2005b) metadiscourse model, I manually coded all metadiscoursal features in the post-method sections of the RAs and performed both quantitative and qualitative analyses. On the basis of the corpus-based research results, a semi-structured interview study was conducted with six specialist informants from the three selected disciplines. The

interview data were used to supplement the discussion of the corpus findings.

The results showed that there are important disciplinary and paradigmatic differences in the use of both interactive and interactional metadiscourse in the post-method sections of the RAs. Across the disciplines, the applied linguistics RAs differed significantly from the psychology RAs in the use of a number of interactive and interactional metadiscourse while the education RAs took a middle position, showing convergence and divergence from the applied linguistics and the psychology RAs in metadiscourse use. Such disciplinary discrepancies can be accounted for by specific knowledge-knower structures prevailing in each of the three disciplines. Across the research paradigms, quantitative RAs used a range of interactive and interactional metadiscoursal features significantly more frequently than qualitative RAs. Furthermore, the mixed methods RAs occupied a middle ground, sharing both similarities and differences with both the quantitative and the qualitative RAs in the use of metadiscourse. These paradigmatic differences could be explained by the contrasting epistemological stances between quantitative and qualitative research paradigms as well as paradigm-specific knowledge-making practices. These general patterns of metadiscourse use were corroborated by the insider accounts from my specialist informants.

A number of implications can be drawn from this study for both novice writers of RAs and for teaching and learning academic writing in courses such as English for academic/specific purposes. The thesis concludes with possible avenues for further research.

CHAPTER I
INTRODUCTION

This chapter begins with a brief sketch of the background of this study, highlighting the importance of academic writing and outlining major research perspectives and analytical approaches. Next, the scope of the study is delimited to academic writing in different disciplines and research paradigms, with a focus on metadiscourse, a type of rhetorical conventions through which the writer, the reader, and the text are weaved together. This chapter then presents the overall research objectives and specific research questions of the study. Finally, a brief overview of the structure of the thesis is provided.

1.1 The Background of the Study

1.1.1 Academic writing and research perspectives

Academic writing generally refers to written communication for academic purposes. The interest in academic writing research has been growing over the past few decades, and the importance of academic writing to both individuals in academy and society at large has been well articulated (e.g. Hyland, 2000, 2009; Hyland & Salager-Meyer, 2008). For individual academics, writing successful academic texts enables them to persuade peers and contribute to knowledge creation within their fields of study (Hyland, 2000). Furthermore, their reputation, rewards, and careers are closely related to their writing and publication (Hyland, 2009). In society, academic discourse has permeated every aspect of our lives, "reshaped our whole worldview", and become "the language of literacy" (Halliday & Martin, 1993, p.11). Overall, this type of discourse can exert powerful influences over other social institutions by providing a model and a way of thinking (Hyland & Salager-Meyer, 2008). Further, writing in academic communities

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can also provide important information about the social practices of scholars in knowledge construction, negotiation, and persuasion (Hyland, 2000). For example, academic texts have been seen as "socially constitutive of disciplines, of individual status and authority, and of knowledge itself" (Hyland & Salager-Meyer, 2008, p.297).

While academic writing or discourse has attracted increasing attention in both language teaching and research, researchers have become more interested in "*how* academics write rather than simply *what* they write about" (Hyland & Salager-Meyer, 2008, p.297). In other words, it is not the subject matter but the discursive practices of academic writing that have interested many researchers. Generally, research on academic writing has been conducted from different perspectives by (a) applied linguists who have focused on the organizational, rhetorical and stylistic features of written texts for descriptive or pedagogical purposes (e.g., Bhatia, 1993; Hyland, 2000; Swales, 1990); (b) historians and those applied linguists who have focused on the rhetorical evolution of research genres (e.g., Atkinson, 1999; Bazerman, 1988; Salager-Meyer, 1998); and (c) sociologists who have attempted to explore interactions between scientists to uncover the process of knowledge construction as embodied in academic texts (e.g., Gilbert & Mulkay,1984; Latour & Woolgar, 1986; Myers, 1990). What is relevant here is the research in applied linguistics, particularly the field of English for Academic/Specific purposes (EAP/ESP), where academic writing has been approached from different methodological traditions, such as genre analysis, corpus-based research, and ethnography (e.g., Charles, 2013, J. Flowerdew, 2002; Lillis, 2008).

1.1.2 Genre approaches

In academic writing, *genre* is a key notion underpinned by a number of underlying

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assumptions (Bawarshi & Reiff, 2010; Berkenkotter & Huckin, 1993, 1995). In general, genre has been examined from different traditions and perspectives, such as literary studies, linguistics, rhetorical and sociological research (Bawarshi & Reiff, 2010; Hyon, 1996). In linguistics, genre has been primarily approached from the traditions of Systemic Functional Linguistics (SFL) and English for Specific Purposes (ESP) (Hyon, 1996). According to Bawarshi and Reiff (2010), although both SFL and ESP approaches examine genre in its social contexts and applies genre analysis in literacy education, they target at different audiences. Whereas SFL research aims to teach genre to "economically and culturally disadvantaged school-aged children in Australia," ESP research mainly targets at "more advanced, often graduate-level, international students in British and American universities" who are non-native speakers of English (Bawarshi & Reiff, 2010, p. 43). In the ESP tradition, genre is defined by Swales (1990) as follows:

> A genre comprises a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style. (p.58)

This definition suggests that a genre is the shared use of conventionalized language through which individual members develop relationships, establish communities and, most importantly, get things done; and that a genre is embedded in a shared social context which both constrains its shape and is shaped by it (cf. Hyland & Salager-Meyer, 2008). Writing in academic communities has formed a constellation or set of interlocking genres in accordance with the purposes and the rhetorical situations of

writing activities (Swales, 2004). While not all genres have equal value for disciplinary practitioners, the genre of research article (RA hereafter) has long enjoyed a privileged status in academic communities. This genre is "a rhetorically sophisticated artifact that displays a careful balance of factual information and social interaction" (Hyland & Salager-Meyer, 2008, p.305). Given its importance, it is not surprising to see that most genre-based approaches to academic writing have focused on this particular genre. An important strand of genre analysis in academic writing aims to describe the rhetorical structure of the RA (e.g., Bhatia, 1993; Swales, 1990). Since the ground-breaking work of Swales (1990), numerous empirical studies along this line have typically used move analysis to identify functional units in particular part-genres or the structural components of RAs (e.g., Basturkmen, 2009, 2012; Bruce, 2009; Holmes, 1997; Lewin, Fine, & Young, 2001; Lim, 2010, 2011; Lin & Evans, 2012; Samraj, 2005; Thompson, 1993; Williams, 1999; Yang & Allison, 2003). While early genre studies primarily relied on discourse-analytic approaches, more recent work in this area has incorporated elements from corpus-based and ethnographic approaches.

1.1.3 Corpus-based approaches

In applied linguistics, a corpus is often defined as "a collection of naturally occurring examples of language, consisting of anything from a few sentences to a set of written texts or tape recordings, which have been collected for linguistic study" (Hunston, 2002, p.2). A distinction has been sometimes made between corpus-based and corpus-driven investigations (Cheng, 2012; McEnery & Hardie, 2012; Tognini-Bonelli, 2001). A corpus-based investigation aims for hypothesis-testing where the researcher checks his/her own intuitions about language use against corpus data. In contrast, in a

corpus-driven investigation, the researcher looks for emerging patterns from corpus data. In other words, a corpus-based approach uses corpus as a method for exploring an existing theory or hypothesis whereas a corpus-driven study rejects the use of corpus as a method but treats corpus itself as the source of theory or hypothesis (McEnery & Hardie, 2012). In relation to academic writing, various types of corpora have been designed and constructed with different sizes, languages, ways of access, and for different uses. Academic learner corpora and expert corpora are two important types of corpora which are of greater relevance for EAP or ESP purposes and for teaching and learning academic writing (Nesi, 2013). While very large corpora, such as the British National Corpus (BNC), or the Professional English Research Consortium (PERC) Corpus, have been built for general or academic purposes, a growing number of corpus-based studies have utilized small-scale, specialized corpora in investigating academic writing such as the corpus of British Academic Written English (BAWE) or Michigan Corpus of Upper-Level Student Papers (MICUSP) (Nesi & Gardner, 2012). A great deal of corpus-based research into academic writing work from bottom-up, that is, using computerized corpora and concordance software to examine the frequency and function of individual lexico-grammatical features in specialized corpora, such as corpora of RAs (e.g., Fløttum, Dahl, & Kinn, 2006; Groom, 2005; Harwood, 2005a, 2005b; Hewings & Hewings, 2002; Hyland, 2000, 2005c).

Although corpus-based studies have received criticisms for being limited to the atomized analysis of corpus data and being at odds with the more top-down genre analysis, some researchers (e.g., L. Flowerdew, 2005) have proposed an integration of corpus- and genre-based approaches to investigating academic writing. By adopting an integrative approach, the corpus analysis may be greatly enhanced by examining lexical

and grammatical features in genre-based rhetorical structures. Moreover, to relate academic writing to its context of production, some corpus-based studies of academic texts (e.g., Hyland, 1998a,1998b, 2005c) have also taken into account ethnographic data when interpreting the corpus findings (L. Flowerdew, 2005), which has constituted another major analytical approach in the investigation of academic writing.

1.1.4 Ethnographic approaches

Ethnography is a qualitative research approach which aims to "understand the social meanings and activities of people in a given 'field' or setting" (Brewer, 2000, p.11). Ethnography is widely used in the fields of anthropology and education, and in writing research it has mainly focused on the writing of students and professional scholars (e.g., Ivanič, 1998; Lillis & Curry, 2006, 2010; Prior, 1998). Ethnography can be conceived of as both a method of data collection and a methodology (Brewer, 2000; Hammersly & Atkinson, 2007). Similarly, in academic writing research, ethnography can be construed as a method, a methodology, and the so-called "deep theorizing" (Lillis, 2008, p.355). At the basic level, ethnography is used as a method or data collection technique. For example, by "talk around text", the research aims to look beyond the written texts and include some ethnographic data to reflect and take into account the writers' perspectives (Lillis, 2008, p.358).

At the level of methodology, ethnographical researchers seek to understand the social world in its natural context (Brewer, 2000, Hammersly & Atkinson, 2007). Similarly, writing researchers also seek to develop contextualized understanding of academic writing. According to Lillis (2008), ethnography as a methodology is characterized by sustained engagement with participants and the use of multiple data sources in exploration. The advantages of ethnography as a methodology include

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developing rich descriptions of the relationship between texts and contexts, and blending emic and etic analytical lens (Lillis, 2008).

At the highest level, ethnography has been used to theorize the text-context relationship in academic writing through such notions as "indexicality" and "orientation" (Lillis, 2008, p.373). Indexicality refers to "specific ways in which bits of language (speech/writing) index, or point to aspects of social context"; and orientation concerns "how speaker/hearer orient to what is said and written" (Lillis, 2008, p.376). Both notions can help academic writing researchers to "capture connections between context and text" (p.376). This approach, according to Lillis (2008), challenges the dichotomy of language and culture and attempts to close the gap between textual analysis and context analysis.

Of greater relevance to the study reported in this thesis is the first level, that is, ethnography as a method. According to Lillis (2008), the use of ethnography in this approach can vary between a focus on the text and a focus on the writer. Where it is text-oriented, the primary research object remains to be the text, and ethnographic data are used as supplementary data only. This method has been widely used by research on academic writing. For example, many empirical studies in EAP and ESP have incorporated some ethnographic data in addition to corpus-based text-linguistic analysis (e.g., Chang & Swales, 1999; Harwood, 2006, 2009; Hyland, 1998a, 2000, 2005c). In contrast, where the research is more writer-oriented, ethnography as a method tends to foreground the insider perspectives in academic writing by exploring participants' understanding of writing practices and conventions dominating in a particular context (e.g., Berkenkotter & Huckin, 1995; Lillis & Curry, 2006, 2010). While this study has obviously anchored itself in the more text-oriented tradition of research, the use of

ethnography as a method can provide supplementary data to my corpus analysis of academic texts.

1.2 The Scope and Focus of the Study

1.2.1 Writing in different academic disciplines

All forms of writing are produced within particular socio-rhetorical contexts, and academic writing is no exception. An important concept related to writing in academic contexts is "discourse community", which is characterized by shared goals, participatory mechanisms and routine discourse conventions (Swales, 1990, p.24). This notion is central to an understanding of academic writing because it provides a means of analyzing communication as a joint, situated activity (Hyland, 2009; Hyland & Salager-Meyer, 2008). Texts produced by members of the same discourse community often display certain degree of homogeneity because a discourse community has constraining power which can affect the community's patterns of communication, including meaning and rhetoric (Hyland, 2000, 2009). In the domain of academic disciplines, discourse communities can be found within and across various disciplines. Individual disciplines have been likened to different academic tribes, each being distinguished by its unique culture and discourse (Becher, 1987; Becher & Trowler, 2001). In other words, every disciplinary community has its own epistemological beliefs, practices, as well as conventions of communication. While the concept of discipline serves as a general label for a field of knowledge, it can either break down into specialist subfields or merge into broad domains of knowledge, hence intra- and cross-disciplinary discourse communities (Becher & Trowler, 2001; Hyland, 2009).

It has been proposed that differences in fields of knowledge or disciplinary communities can be reflected in their distinct discourses (Becher, 1987). A comparison

of the linguistic features of writings in history, sociology and physics has revealed differences in the discourses of the three disciplines (Becher, 1987). In terms of language style, whereas historians tend to use everyday language in their discussion, the language of physics is impenetrable to outsiders. The language of sociologists is accessible but involves the use of technical or semi-technical terms. As regards citation practice, although no quantitative information was reported, Becher (1987) found notable differences in motivation behind the citation behaviors. Specifically, historians used citations primarily to preserve solidarity, and sociologists cite from well-known figures to demonstrate good intellectual network, whereas physicists use citations to prove the reliability of a technique or a procedure adopted in the research.

Research into disciplinary discourses in the humanities and social sciences suggests that differences in linguistic forms can be associated with disciplinary epistemologies and knowledge-making practices. For instance, in a cross-disciplinary comparison, MacDonald (1992, 1994) examined the textual practices of developmental psychology, social history of colonial New England, and renaissance New Historicism in literary studies. The researcher discovered that there were sentence-level differences in the three disciplinary discourses and argued that those differences were related to the differences in knowledge-making. As MacDonald (1994) reported, the three disciplines under examination differed in negotiating knowledge claims and in degrees of particularism. In negotiating knowledge claims, the psychologists made more frequent use of epistemic sentence subjects (e.g., *reason*, *research*), suggesting that the discipline of psychology tended to foreground epistemic categories and to build on previous knowledge. In contrast, the patterns of grammatical subjects in literary scholars' writings focused more on phenomenal categories referring to specific people, places or

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objects (e.g., *Shakespeare*), which indicated that literary studies were more concerned with concrete phenomena, as compared with psychology. In addition, the historian appeared to take a middle position between psychologists and literary scholars in the linguistic choice of grammatical subjects. A similar pattern of disciplinary variation was found in the extent of particularism among the three disciplines. Where the writers from literary studies more frequently referred to particularistic phenomena, those in psychology were most interested in generalizing from particulars, and those in history were interested in both particular and generalizable patterns. More recently, Afros and Schryer (2009) compared the use of promotional lexcio-grammar and other discursive devices between linguistics and literary RAs. They discovered that academic from both disciplines used the rhetorical strategies of positively evaluating their own study and negatively evaluating alternative views. The two disciplines, however, varied in the distribution of these devices across part-genres and moves.

Apart from individual disciplines and specialisms, differences in textual practices have also been identified between broad knowledge domains. Roughly, disciplinary communities can be differentiated between the hard and the soft knowledge domain, corresponding to the natural sciences and the social sciences/ humanities respectively (Becher & Trowler, 2001). Due to the different nature of knowledge between the soft and the hard disciplines, differences may also show up in their disciplinary cultures and patterns of communication. For instance, knowledge in the hard disciplines is typically well-defined and cumulative, and considerable research inputs tend to concentrate on a few problems, resulting in intense competition and accelerated progress. This in turn promotes a rapid style of communication which relies on both written and spoken media, formal and informal channels (Becher, 1987; Becher & Trowler, 2001). By contrast, in

the soft domain, knowledge is viewed as dialectical and interpretive, and research problems are more diverse and less well-defined. Research inputs are less concentrated and there is relatively less competition and little urgency for communication. Consequently, information is mainly conveyed by written materials such as monographs whose publication takes much time (Becher, 1987). These broad differences in knowledge-making practices are reflected in the textual and rhetorical conventions of academic discourse. Stotesbury (2003), for instance, looked into the language of explicit evaluation in the abstracts of the humanities, the social sciences, and the natural sciences. It was found that, on the one hand, the abstracts of the humanities and social sciences employed more evaluative attributes as compared with those of the natural sciences; on the other, the natural sciences used more modality markers than the other two groups in expressing authorial stance.

In a similar vein, Hyland (2000, 2005c) provided much evidence with regard to rhetorical differences in academic texts between the hard and the soft disciplines. Consistent with their disciplinary assumptions, academic writers in the hard knowledge domain typically represented themselves as objective researchers, hiding their authorial presence and subjectivity. By contrast, the writers from the soft knowledge domain showed more personal involvement and interaction with readers in their textual representation, signifying the interpretive nature of knowledge in their fields.

In summary, the previous discussion suggests a strong connection between disciplinary epistemology and disciplinary discourses. Disciplinary communities differ in beliefs and assumptions about knowledge. Such epistemological beliefs are likely to shape their disciplinary discourses and textual embodiments.

1.2.2 Writing in different research paradigms

While writing in a particular disciplinary community is shaped by its disciplinary culture, a major component of that culture is its method of inquiry, or more broadly, research paradigm. A research paradigm can be broadly defined as a set of beliefs and assumptions about the world and knowledge that guide the research practice of those working within that paradigm (Guba, 1990). These beliefs and assumptions about ontology and epistemology are essential to a particular paradigm in scientific inquiries (Guba, 1990; Morgan, 2007). Because different research paradigms differ in their ontological and epistemological assumptions, they tend to favor different methodologies and approaches to research, as well as influence the respective ways of knowledge-making and representation.

The literature on research paradigms or methodologies has generally distinguished three broad approaches to research in the social sciences: quantitative, qualitative, and mixed methods research (Teddlie& Tashakkori, 2009). Quantitative research has positivist or postpositivist roots, whereas qualitative research subscribes to constructivism and other anti-positivist epistemologies (Cohen, Manion, & Morrison, 2011). Mixed methods research is situated somewhere in-between and is often underpinned by pragmatism (Johnson & Christensen, 2012, Morgan, 2014). As will be elaborated in Chapter 3, Teddlie and Tashakkori (2009) propose that these research paradigms can be viewed as different paradigmatic communities with distinct epistemologies. Given their differences in epistemological assumptions, discourses within these paradigmatic communities are thus produced and judged in relation to the communities' norms and conventions.

In terms of their discourses, quantitative and qualitative paradigms are likely to

differ in textual representation and rhetoric (Firestone, 1987; Hansen, 1988; Holliday, 2007). Empirical reports of quantitative research often appear detached, objective and impersonal in style and aim to convince readers of the rigor of certain procedures. The language is viewed as a conduit for conveying phenomena, data and theories, and the role of individual researchers is normally downplayed (Firestone, 1987). Research is typically reported in a text schema of Introduction-Method-Result-Discussion (IMRD), and conclusions are often qualified (Madigan, Johnson, & Linton, 1995). These textual conventions and rhetorical features reflect, to some extent, the empiricist values upheld by a positivistic research paradigm.

In comparison, writings in qualitative research do not prioritize procedures but tend to provide "an unfolding story" in a narrative form to help readers make sense of the data (Holliday, 2007, p.122). Unlike reports on quantitative research which are typically monologic in that only the researcher's voice is heard, writing in qualitative research tends to be heteroglossic or polyphonic, allowing both the researcher and the participants to have a voice in texts (McCarthy & Fishman, 1996). In terms of style and structure, qualitative research writing tends to show more variability and may not necessarily follow the IMRD structure strictly. These conventions of writing in qualitative research imply an interpretive nature of the research and the co-construction of realities and knowledge in the texts. Although little is revealed in the extant literature about the conventions and styles of mixed methods RAs, there is reason to expect that texts reporting this type of RAs would display a hybrid nature, since mixed methods research strives to combine both quantitative and qualitative components in its methodological commitment (Calfee & Sperling, 2010; Morgan, 2014; Teddlie & Tashakkori, 2009). Of course, mixed methods research may also vary from each other

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due to the fact that there are different degrees of mixture, for example, whether the quantitative and the qualitative components are equally integrated or what is the sequential order of combination (Morgan, 2014).

To sum up, there appears to be a potential connection among epistemological assumptions, research paradigms, and discourse conventions. As Hansen (1988) suggests, "the assumptions about what can be known, how it can be known, and how certainly it can be known" not only provide the basis for research paradigms, but also "dictate rhetorical choices about invention, arrangement, and even style" (p.207). Thus, both patterns of textual organization, such as the conventional IMRD structure, and rhetorical characteristics, such as the use of metadiscourse, might vary according to different epistemological assumptions and research paradigms. While a range of academic genres, such as RAs, monographs, brief reports, may be utilized to report quantitative, qualitative, or mixed methods research, RAs appear to be a principal genre for writing and publishing in academic communities, particularly in the social sciences. Thus the RAs will be the focal genre in the present study.

1.2.3 Metadiscourse in academic writing

One important strand of research on academic writing has focused on the interpersonal dimension embodied in academic texts. Studies in this strand have examined interaction in academic texts from different perspectives, for example, metadiscourse (e.g., Hyland, 1998c, 2005b, 2005c), stance and evaluation (e.g., Hunston & Thompson, 2000), or appraisal (e.g., Hood, 2010; Martin & White, 2005). Although these perspectives do overlap and each shed some light on the interpersonal aspect of academic writing, every perspective has adopted its own analytical framework, and the results may not be directly comparable. In what follows, I will provide a brief account

of these different but related frameworks, discussing the common ground and the possible differences among them.

Metadiscourse is a cover term for a group of textual and interpersonal rhetorical resources used to organize texts, guide readers' interpretation, and express authorial stances and writer-reader interaction (Hyland, 1998c, 2005b; Hyland & Tse, 2004; Vande Kopple, 1985, 2002). Although there has been no consensus on the classification of metadiscourse, two basic types of metadiscourse have been distinguished based on their primary functions (Hyland, 2005b; Hyland & Tse, 2004; Vande Kopple, 1985, 2002). One type is referred to as textual/interactive metadiscourse, comprising rhetorical features which help to indicate logical relations between clauses and to guide readers through different text sections. The other type is interpersonal/interactional metadiscourse, which is used to mark the writer's epistemic and attitudinal stance and engage readers in a virtual dialogue.

Evaluation is a broad cover term used for "the expression of the speaker or writer's attitude or stance towards, viewpoint on, or feelings about the entities or propositions that he or she is talking about" (Thompson & Hunston, 2000, p.5). Most of the pioneering work on evaluation focuses on written academic discourse, and Hunston (1989) has proposed a model of evaluation consisting of functions of status, value, and relevance. According to Hunston (2000, 2011), status is assigned to every proposition which is open to further evaluation. Value can be given to worldly entities external to text or to propositions/statements internal to text. Finally, relevance marks the degree of relevance of certain stretches of text. Hunston (2011) points out that her work on value has been largely overtaken by Martin and White's (2005) appraisal model.

As Hunston (2011) suggests, stance is a term used in two distinct ways. First, it is

used by researchers such as Biber and Finegan (1988, 1989) and Conrad and Biber (2000) to refer to the overt linguistic expression of a speaker's attitude, feelings, and commitment concerning his or her message. Researchers adopting this approach to stance are more quantitative-oriented and primarily limit their investigation to certain grammatical encodings such as sentence adverbials, (Conrad & Biber, 2000) or particular lexical features such as attributive markers (Bednarek, 2006). A second use of stance refers to an interpretation of stance as an activity rather than a collection of linguistic markers (Hunston, 2011). This use of stance allows researchers to take a more fine-tuned, qualitative exploration of stance-taking activities, such as in conversation analysis (Englebreston, 2007).

Appraisal is a theoretical perspective informed by Systemic Functional Linguistics and developed by Martin and his colleagues (e.g. Martin & White, 2005; Martin & Rose, 2007). In general, appraisal resources focus on tenor at the level of discourse semantics. Martin and White (2005) classify appraisal resources into three systems of meaning: Attitude, Engagement, and Graduation, and each of these systems can be further divided into subsystems. Attitude is concerned with feelings, emotions, and evaluation of things. Engagement adjusts the speaker or the writer's degree of commitment to what he or she is saying. Graduation deals with the grading or intensity of utterances and the focus of categorization.

Overall, these different terms as noted above are used to refer to a largely common area of language use (Bednarek, 2006; Hunston, 2011). For example, hedges and boosters are two metadiscoursal resources used to express primarily epistemic meanings. These same linguistic phenomena are covered under various labels, such as epistemic stance, status, or engagement in the respective frameworks. As another example, all

frameworks converge in the language used for expressing personal attitudes and emotional reactions. Subtle differences, however, exist among these analytical frameworks. For instance, one type of semantic resources called proclaim: pronouncement in the appraisal system overlap to a great extent with the metadiscoursal subcategory of boosters in that both refer to a high degree of the speaker/writer's investment or commitment to propositions. Despite such similarity, Martin and White (2005, p. 133) point out that whereas pronouncements are "dialogistically contractive" (e.g. *indeed*), boosters can be either dialogistically expansive (e.g. he *must* be lying…) or contractive (e.g. *I contend that…*)". Further, although all these frameworks focus on the tenor or the interpersonal dimension of language use, metadiscourse is more inclusive by subsuming a variety of interactive resources. Some of the interactive resources, such as endophoric markers and frame markers, fall outside the coverage of the other frameworks.

As this study builds on previous work in this line of research, it focuses on the use of metadiscourse as part of the rhetorical conventions in RAs. As part of rhetorical conventions, metadiscourse in academic texts is likely to be constrained by primarily disciplinary, paradigmatic, and/or cultural norms. Thus, an analysis of the use of metadiscourse in academic texts such as RAs may yield insights into the underlying mechanisms of the disciplinary or cultural discourse communities. Within the field of academic writing, there has been a mounting interest in the use of metadiscourse in academic genres in general and in RAs in particular. Generally, writing research has paid considerable attention to the use of metadiscourse in a range of academic genres such as textbooks (e.g. Kuhi & Behnam, 2011), research articles (Hyland, 2005c), book reviews (e.g. Tse & Hyland, 2006), thesis and dissertations (e.g. Bunton, 1999), student

essays (e.g. Ädel, 2006), and academic lectures (e.g. Dafouz-Milne & Perucha, 2010). Empirical studies of metadiscourse in RAs can be grouped according to three analytical perspectives: cross-generic, cross-cultural/linguistic, and cross-disciplinary (see Chapter 2 for details). A brief overview of the relevant literature indicates that metadiscourse use in RAs is sensitive to its context of use. For example, notable differences in the use of metadiscourse have been found in the hard versus the soft disciplines (e.g., Hyland, 1998c, 2005c; Lafuente-Millán, 2010; Peacock, 2006). Such disciplinary differences are believed to be reflective of the contrasting epistemologies in the natural and social sciences, as discussed in Section 1.2.1 above. Due to differences in the nature of knowledge and disciplinary cultures, it is reasonable to expect academic writing from different disciplines and paradigms to show variation in textual conventions and writer stances.

1.3 Research Purpose and Questions

The overarching purpose of the present study is to compare how different academic disciplines and research paradigms may affect the use of metadiscourse in academic discourse, particularly in the genre of research articles.

By contextualizing the present study in previous research, it is obvious to note two important lacunas in current research on metadiscourse use in academic discourse. Firstly, although broad differences have been identified in metadiscourse use between the soft and the hard knowledge domain (e.g., Hyland, 2005c), it is not clear to what extent individual disciplines might differ from each other within either domain in the use of metadiscourse. Since most cross-disciplinary studies on metadiscourse have chosen to contrast disciplines from the natural sciences with those from the social sciences and/or the humanities, there has been a neglect of possible disciplinary

differences within either the hard or the soft knowledge domain. The present study thus attempts to address this research gap by making a comparison of three disciplines from the social sciences: applied linguistics, education, and psychology. These disciplines, though from the same area of the social sciences, are expected to display some inter-disciplinary variations in terms of textual conventions because there may exist nuanced differences in their disciplinary orientations and their knowledge-making practices (Lim, 2010, 2011; MacDonald, 1992, 1994). Thus, it is plausible to expect that the discourses of these disciplines may show some differences in rhetorical conventions such as metadiscourse.

Secondly, apart from academic discipline, the use of metadiscourse in the genre of RA may also be subject to a variety of other influences. While previous research has identified genre, language, and culture as a few major variables shaping metadiscourse in academic texts, little is known about how the use of metadiscourse might be affected by research paradigms. Although findings from cross-disciplinary studies may be suggestive of paradigmatic orientations (e.g., Hyland, 2000, 2005c), it is not yet clear whether and to what extent different research paradigms, such as quantitative, qualitative and mixed methods research, might shape discourse conventions in academic texts such as RAs. Given that knowledge creation is driven by research paradigms, it is reasonable to hypothesize that the use of metadiscourse in different types of RAs might show variation consistent with the underlying epistemologies of the respective research paradigms.

To address the research gaps as identified above, the present study aims to examine the use of metadiscourse across three disciplines and three research paradigms. Specifically, this study hopes to address the following four research questions:

1. What are the differences, if any, among the disciplines of applied linguistics, education, and psychology in the use of interactive metadiscourse in RAs?

2. What are the differences, if any, among the disciplines of applied linguistics, education, and psychology in the use of interactional metadiscourse in RAs?

3. What are the differences, if any, among quantitative, qualitative, and mixed methods research paradigms in the use of interactive metadiscourse in RAs across the three aforementioned disciplines?

4. What are the differences, if any, among quantitative, qualitative, and mixed methods research paradigms in the use of interactional metadiscourse in RAs across the three aforementioned disciplines?

The first two questions are concerned with the use of metadiscourse in RAs from different disciplines. The term *use* in this study refers to the frequencies of occurrence, the linguistic forms, and the communicative functions of each major type and subtype of metadiscourse in the corpus of RAs. A distinction is made between interactive and interactional metadiscourse because these two broad types have distinct functions in academic texts and may be used differently in different disciplines (Hyland, 2005b). Likewise, the same distinction is also made in the third and the fourth questions which are concerned with the use of metadiscourse in different types of research paradigms across the selected disciplines. The cross-disciplinary and cross-paradigmatic comparisons of metadiscourse are expected to provide evidence to support or reject the hypothesized differences among the different disciplines and paradigms. To address these questions, a mixed methods approach has been adopted, combining the strengths of both corpus-based analysis and qualitative interviewing methods. Specifically, I designed and constructed a small-scale, specialized corpus of RAs and conducted both

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quantitative and qualitative textual analyses. To complement my etic perspective as an analyst, interview data with disciplinary insiders were also collected and analyzed. Taken together, such an approach is capable of providing a comprehensive understanding of the use of metadiscourse across the disciplines and the paradigms.

1.4 Structure of This Thesis

This thesis consists of seven chapters. Chapter 1 introduces the background of the study and contextualizes the study in the current research on academic writing. The chapter also outlines the research scope and carves out a niche for the present study.

In Chapter 2, I first provide a critical review of different conceptualizations of and approaches to metadiscourse. Next, I critically evaluate Hyland's (2005b) interpersonal model of metadiscourse and propose to adapt his model for my own purposes. In the remainder of Chapter 2, I review relevant empirical studies on metadiscourse in academic writing, particularly in RAs from two perspectives: cross-generic and cross-disciplinary. This focused literature review leads to the identification of a clear need for more research within the soft disciplines.

Chapter 3 proposes a theoretical model for examining disciplinary and paradigmatic influences on the use of metadiscourse in RAs. The chapter begins with a synthesis of theoretical perspectives drawn from Bernstein's (1999) horizontal/hierarchical knowledge structures and Maton's (2000, 2007, 2010a, 2014) knowledge-knower structures to provide a framework for analyzing differences in disciplinary discourses. Next, I present an overview of the definitions and classifications of paradigms in social science research. Through a review of relevant literature, the three major paradigms, that is, quantitative, qualitative, and mixed methods paradigms, are juxtaposed with each other and their positions regarding ontology, epistemology, and methodology are

contrasted. Then I propose a working model of the relationship between paradigms and knowledge creation and representation. Based on this model, the chapter reviews extant literature on how quantitative and qualitative research paradigms differ in their discursive practices and rhetorical conventions, and finally, concludes by the call for more research across different paradigms.

Chapter 4 details the methodology used in this study. First, I explicate mixed methods design of the present study. Then I report the construction of the corpus and how the corpus data have been coded and analyzed both quantitatively and qualitatively. This is followed by an explanation of the collection and analysis of the supplementary interview data. Finally, I make a case that a blending of different data sources can provide more comprehensive answers to my research questions.

Chapter 5 and Chapter 6 report and discuss findings from the present study. Although the two chapters focus on different types of metadiscourse, they are structured and organized similarly. In Chapter 5, I focus on interactive metadiscourse and present the results from the corpus-based analysis of how the use of the main types and subtypes of interactive metadiscourse differ across the disciplines and the paradigms. Chapter 6 reports the results of interactional metadiscourse and how different main types and subtypes of interactional metadiscourse are employed by the RAs writers from the paradigms and the disciplines. In both chapters, the disciplinary differences are explained in terms of the dominating knowledge-knower structures of particular disciplines in question. The paradigmatic differences in the use of metadiscourse are discussed and attributed to the respective epistemological assumptions underlying the quantitative, qualitative, and mixed methods paradigms. In interpreting the results, excerpts from the insiders' accounts are drawn on to complement my corpus analysis.

Chapter 7 concludes the thesis by summarizing the main findings of the study, discussing the significance of these findings, and drawing implications for teaching and learning academic writing. Finally, the thesis ends with an acknowledgement of the limitations of the study and suggests possible directions for further research.

1.5 Summary

This introductory chapter has set the background of this study within the broad field of applied linguistics by presenting an overview of research on academic writing and some major research perspectives. By outlining the three main analytical approaches to academic writing, namely, genre analysis, corpus-based approaches, and ethnographic approaches, I hoped to situate the present study within the well-established traditions of research on academic discourse. Next, I have narrowed down the broad perspectives on academic writing to focus on writing in different disciplines and paradigms, with particular attention to an array of rhetorical resources that can be used to express both textual and interpersonal meanings. Two important research gaps related to disciplines and paradigms were identified, which justifies the research objective of this study and its research questions. Finally, I provided a brief survey of the different parts of this thesis. The next chapter will focus on the central concept of this study, metadiscourse, and review the major theoretical issues and empirical studies related to this notion.

CHAPTER II
METADISCOURSE: THEORY AND PRACTICE

As a linguistic construct, metadiscourse has received much attention in applied linguistics over the past few decades, particularly in the fields of composition, academic writing, and discourse analysis. Despite the growing interest in metadiscourse, there is yet no agreed-upon basis for its conceptualization and classification. This chapter aims to review the existing theoretical discussions of metadiscourse and provide an overview of empirical studies on its use in academic contexts.

In this chapter, I shall firstly explicate some fundamental issues concerning the definitions and various analytical approaches to classifying metadiscourse, in particular, the 'broad' and 'narrow' approaches. Next, I will provide a broad overview of metadiscourse research across different contexts, particularly in academic settings. Two major strands of empirical research will be covered in the review: cross-generic, and cross-disciplinary (cf. Lafuente-Millán, Mur Dueñas, Lorés-Sanz, & Vázquez-Orta, 2010). Finally, based on a review of the relevant empirical research, I will highlight the need for the present study and propose to extend the current research by investigating the use of metadiscourse across three social science disciplines and three research paradigms.

2.1 The Concept of Metadiscourse

Although metadiscourse is not a new concept (see Vande Kopple, 1985), over the past few decades, it has received much research attention in applied linguistics and the related fields (Swales & Leeder, 2012). The concept of metadiscourse covers a vast range of heterogeneous rhetorical devices which have been variously termed as metatalk

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(Schiffrin, 1980), metatext (Mauranen, 1993a, 1993b), and subsumed by such linguistic frameworks as evaluation (Hunston & Thompson, 2000), stance (Biber et al, 1999, Conrad & Biber, 2000), and appraisal (Martin & White, 2005), as noted in the previous chapter (Section 1.2.3).

The notion of 'metadiscourse', probably coined by Zellig Harris in 1959 (Beauvais, 1989; Hyland, 2005b), has since been explored by various scholars from a range of perspectives, for instance, communication, pragmatics, rhetoric and composition. Although each perspective defines metadiscourse in its own way, all perspectives stress that metadiscourse is reflexive and interactive in nature and is a pragmatic use of language in communication.

In communication theory, for instance, metadiscourse refers to "talk about talk", that is, "the pragmatic use of language to comment reflexively on discourse itself" (Craig, 2008, p. 3107). In other words, the use of metadiscourse involves a shift of attention or focus away from the ongoing communication and places a stretch of discourse in a context or frame which constrains the meaning and the manner of the ongoing communication. For example, by using expressions like *first* and *second*, a speaker frames a following segment of discourse as a series of ordered points (Craig, 2008). The use of metadiscourse in this sense appears to be closely related to what is called meta-communication in pragmatics where a change of level from primary communication is involved (Hübler, 2011). In other words, while primary communication is concerned with messages or content, the meta-communication is about how to present such messages.

Within pragmatics, metadiscourse has been approached in terms of speech act theory (Beauvais, 1989), the cooperative principle (Abdi, Tavangar, & Tavakoli, 2010),

and relevance theory (Aguilar, 2008; Ifantidou, 2005). For example, Beauvais (1989) believes that "a useful theory of metadiscourse must first use pragmatic terms to identify the functions that metadiscourse can serve in a text, and *then* use syntactic terms to identify the various forms that can serve each function" (p.13). Thus, in accordance with speech act theory of Austin, Beauvais (1989) defines metadiscourse as "illocutionary force indicators that identify expositive illocutionary acts" (p.15) and proposes a taxonomy of metadiscourse as primary and secondary illocutionary acts.

Based on Gricean cooperative principle (CP), Abdi et al. (2010) reconceptualize metadiscourse in the genre RAs. They adopt CP maxims such as manner, quantity, quality, and add a new maxim—interaction, and use the framework to account for the metadiscursive strategies found in RAs across six disciplines in the natural and the social sciences.

From a relevance-theoretic perspective, the relevance of an input in communication can be assessed by the balance between "cognitive effects" and "processing effort" (Sperber & Wilson, 1995; Wilson & Sperber, 2004). A communicator is likely to maximize the relevance of his/her utterance to the intended audience by increasing the cognitive effects of an input and decreasing the required processing effort (Sperber & Wilson, 1995; Wilson & Sperber, 2004). When applying this principle to written communication, a writer may provide the "ostensive stimulus" (Wilson & Sperber, 2004, p.611), namely, a linguistic cue in verbal communication, to attract readers' attention based on his/her assessment of the readers' cognitive and contextual needs. By implication, metadiscursive resources can be seen as the ostensive stimuli used by the speaker/writer who seeks to maximize the relevance of his/her propositional information addressed to the reader (Aguilar, 2008). Several scholars have investigated the use of

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various metadiscursive resources from the relevance-theoretic perspective, such as code glosses (Murillo, 2004), transitions and frame markers (Aguilar, 2008), as well as evidential markers (White, 2011).

In addition, metadiscourse has been increasingly associated with a type of reflexive language use which is variously referred to as "metapragmatic discourse" (Lucy, 1993, p. 17), "explicit metapragmatics" (Hübler, 2011, p. 108, see also Hübler & Bublitz, 2007), or more broadly as "metapragmatic awareness" (Verschueren, 2000, p.445). Thus, metadiscourse can be seen as part of metapragmatics which involves "the pragmatics of actually performed meta-utterances that serve as means of commenting on and interfering with on-going discourse or text" (Hübler & Bublitz, 2007, p. 6). In analyzing metapragmatics, a basic distinction has been drawn between meta-utterances which focus on the structural aspects and those which focus on the interactional aspects according to the purpose and level of the communication (Hübler, 2011). Perhaps inspired by this distinction, most research on metadiscourse has drawn a similar division between the textual and the interpersonal aspects.

In the field of rhetoric and composition, Mao (1993) has distinguished between two different senses of metadiscourse. On one hand, metadiscourse is used in a general sense to refer to "discourse *about* discourse", that is, "any kind of critical interpretation or theoretical exposition of a given (or 'target') discourse or theory" (p.265). In this sense, the use of metadiscourse is often analogous to the creation of other terms prefixed by *meta*, such as metacognition or metahistory. On the other hand, Mao (1993) clearly prefers to define metadiscourse more specifically as "various kinds of linguistic tokens that an author employs in her text to guide or direct her reader as to how to understand her, her text, and her stance toward it" (p. 265). It is this sense of

metadiscourse, according to Mao (1993), that is more interesting to scholars of rhetorical and composition studies.

Despite a proliferation of definitions, it has been lamented that metadiscourse "has always been something of a fuzzy term" (Hyland, 2005b, p. 16). This is especially true when considering its various definitions which are usually vague or elusive, such as "writing about writing" (Williams, 1985, p.226), "discourse about discourse" (Vande Kopple, 1985, p. 83), "discoursing about the discourse" (Crismore, 1984, p.280), and "talk about talk" (Craig, 2008, p. 3107). The fuzziness of this term, as Hyland (2005b) observes, can be partly attributed to the "heterogeneity of the features of spoken and written discourse which can signal the dimensions of context that metadiscourse refers to" (p.18). Although earlier researchers mostly agree that metadiscourse signals writer's attempt in the text to guide reader's perception, no consensus could be reached concerning how to define the term precisely, what linguistic forms to include under the rubric of metadiscourse, and how to classify or group those various devices. In other words, because an explicit theoretical basis is lacking, it is inherently difficult to define, identify and classify a myriad of linguistic features which serve to connect the sender, the receiver and the organization of the message. Disputes arise over issues such as whether metadiscourse should be propositional or non-propositional (e.g., Ifantidou, 2005; Khabbazi-Oskouei, 2013; Mao, 1993), whether it should be primary or secondary in status (e.g., Ädel, 2005, 2006; Hyland, 2005b; Hyland & Tse, 2004) and whether it should include an interactional dimension, as "narrow" or "broad" approaches disagree about (Ädel, 2006, p.168; see also Mauranen, 1993b, p.145, for a similar distinction between "non-integrative" and "integrative" approaches).

Admittedly, the controversies surrounding metadiscourse are far from over, but

researchers have made attempts at defining this phenomenon more systematically by drawing upon various theoretical perspectives. Nevertheless, there have been some enduring theoretical controversies on the notion of metadiscourse, which will be discussed below.

2.2 Major Theoretical Issues in Metadiscourse

As Hyland and Tse (2004) have observed, although metadiscourse is an intuitively interesting notion, it is "under-theorized and empirically vague" (p.156). Discourse analysts often find it difficult to pin down metadiscourse in practice. There are considerable disagreements among metadiscourse theorists over issues such as what are the boundary and relationship between metadiscourse and propositional discourse, and how to identify and classify metadiscoursal devices. These issues will be discussed in detail in the following section.

2.2.1 Propositional versus non-propositional discourse

The first issue to be dealt with concerns the question of whether metadiscourse is propositional or non-propositional, and in relation to this, whether it is a primary or secondary discourse. Early discussions on metadiscourse often define the concept by differentiating between propositional and non-propositional aspects of discourse. For example, Vande Kopple (1985) maintains that there are two levels involved in communication: the propositional level and the metadiscoursal level. The propositional level is concerned with supplying information about the subject matter, whereas "on the level of metadiscourse, we do not add propositional material but help our readers organize, classify, interpret, evaluate, and react to such material [propositional content]" (p. 83). In a similar vein, when comparing the use of metadiscourse between American and Finish university students' argumentative texts, Crismore, Markkanen, and

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Steffensen (1993) define metadiscourse as "the linguistic material in texts, whether spoken or written, that does not add anything to the propositional content but that is intended to help the listener or reader organize, interpret, and evaluate the information given" (p.40). These and other similar definitions have helped establish a contrast between propositional and non-propositional discourse or metadiscourse. As the above definitions insist, one key perceived feature of metadiscourse, as compared with propositional discourse, is that it is devoid of any subject matter or propositional meaning. Under this view, metadiscourse is no more than commentaries to propositional contents or stylistic manipulation dependent on individual idiosyncrasies (Hyland, 2005b).

This dichotomy between propositional discourse and metadiscourse has also resulted in a hierarchy of discourse. It is claimed that the propositional content constitutes a level of primary discourse, whereas the metadiscourse works on a different level and does not "expand the propositional information of a text" (Vande Kopple, 1985, p.85). Such a view is also echoed by others when commenting on the distinct functions of primary discourse and metadiscourse (e.g., Crismore & Farnsworth, 1990; Crismore et al, 1993). Metadiscourse is thus considered not only non-propositional but also secondary in status.

Nevertheless, some metadiscourse researchers have questioned the stringent distinction between propositional and non-propositional discourse, particularly the equation of non-propositional with non-truth conditional meanings. For example, Ifantidou (2005) argues that the widespread assumption of metadiscourse as non-propositional in nature has been a misinterpretation. Although certain metadiscourse markers are non-propositional, a wide range of metadiscoursal features

such as modal adverbials, evidential main-clause verbs, and discourse connectives may contribute to truth-conditional meaning, that is, the propositional content of discourse. Mao (1993) also points out that as long as metadiscourse is subject to truth-conditional judgment, "the apparent basis for characterizing metadiscourse as being 'nonpropositional' collapses", and "it is therefore implausible to designate one type of discourse as being primary and the other type as being secondary when both types fulfill the same kind of communicative infelicities" (p. 267). In relation to this, Ädel (2006) notes that the characterization of metadiscourse as non-propositional discourse is a historical result of describing metalinguistic phenomena by using semantic criteria, which has become less appropriate from the perspective of pragmatics. From a semantic perspective, a typical metalinguistic expression such as *here is an example* is considered propositional because the veracity of this proposition can be checked by looking at whether there is an example or not. However, such a truth-conditional criterion becomes irrelevant from a pragmatic or functional point of view. Through the use of metalinguistic expression *here is an example*, the writer/speaker is probably making a comment on the running text/utterance rather than communicating the subject matter of the discourse. Thus, it can be seen that part of this confusion of metadiscourse with propositional discourse has occurred because metadiscourse as a pragmatic concept is mixed up with proposition as a semantic notion.

It is worth noting that while Ädel (2006) also acknowledges that a rigid definition of metadiscourse as non-propositional material is untenable, she does suggest that it would be feasible to relax the criteria and maintain a distinction between metadiscourse and the subject matter of a text. Interestingly, a similar point has also been made by Hyland (2005b), though his theoretical framework is very different from that of Ädel.

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Hyland rejects a separation between primary and secondary discourse and sees metadiscourse as more than supporting propositional content, arguing that metadiscourse is "the means by which propositional content is made coherent, intelligible, and persuasive to a particular audience" (2005b, p. 39). In other words, metadiscourse is not an entirely different level of discourse, but is integrated with propositional discourse in the process of communication. As Hyland and Tse (2004) have observed, "a rigid conceptual separation between proposition and metadiscourse relegates the latter to a commentary on the main informational purpose of the text rather than seeing it as an integral process of communicating meaning" (p.161). In short, the relationship between metadiscourse and proposition becomes a complex one. On the one hand, in terms of pragmatics, it is unhelpful to draw a too rigid distinction between metadiscourse and propositional discourse as both may be subject to truth-conditionals; on the other hand, it is necessary to maintain a relaxed version of the distinction as a useful starting point in identifying metadiscoursal features.

The difficulty to draw a clear boundary between metadiscourse and propositional discourse is perhaps "because the idea of 'proposition' is under-theorized and rarely elaborated" and thus may not provide researchers with "an infallible means of identifying what is propositional and what is not" (Hyland, 2005b, p.38). To better theorize the notion of metadiscourse, Hyland (2005b) draws on Sinclair's (2004) conceptualization of "planes of discourse" (p.51) where an "interactive plane" (p.52) (writer-reader interaction) is distinguished from an "autonomous plane" (p.53) (the record of experience). Based on this distinction, metadiscourse can be seen as working on the interactive plane and is distinguished from propositional discourse by orienting towards the discourse instead of the subject matter about the world. According to

Hyland (2005b), both propositional discourse and metadiscourse are essential to the process of communication, and metadiscourse is not "secondary" but a "specialized" (p.39) type of discourse in organizing texts, constructing stance, and interacting with readers.

2.2.2 The broad versus narrow approaches to metadiscourse

The second key question for metadiscourse theorists to address is how to classify the diverse devices collected under the cover term of metadiscourse. Researchers adopting different theoretical assumptions have different understandings of metadiscourse and have proposed a variety of taxonomies. Ädel (2006) and Hyland (2005b) have provided some excellent summaries of the major classification schemes in the metadiscourse literature. It should be noted that disagreements over the role and boundary of metadiscourse have given rise to two different approaches in the literature, namely, the "integrative" and the "non-integrative" approach (Mauranen, 1993b, p.145) or the "broad" and the "narrow" approach (Ädel, 2006, p.168). More recently, Ädel (2010) has renamed these two approaches as the "interactive model" and the "reflexive model" (p.70).

A broad, integrative approach to metadiscourse includes a wide range of textual and interpersonal features that are metadiscoursal (see Vande Kopple, 1985; Crismore & Farnsworth, 1990; Crismore et al., 1993; Hyland, 1998c). Table 2.1 presents a summary of the major analytical schemes of metadiscoursal resources produced in the broad approach.

Table 2.1

Analytical Schemes of Metadiscourse in the Broad Approach

	Vande Kopple (1985)	Crismore et al. (1993)	Hyland (1998c)

Textual metadiscourse	(1) Text connectives
	   sequencers
	   logical connectors
	   reminders
	   announcers
	   topicalizers
	(2) Code glosses
		(1) Textual markers
		   logical connectives
		   sequencers
		   reminders
		   topicalizers
		(2) Interpretive markers
		   code glosses
		   illocution markers
		   announcers
			(1) Logical connectives
			(2) Frame markers
			(3) Endophoric markers
			(4) Evidentials
			(5) Code glosses

Interpersonal metadiscourse	(3) Illocution markers
	(4) Validity markers
	   hedges
	   emphatics
	   attributors
	(5) Narrators
	(6) Attitude markers
	(7) Commentary
		(3) Hedges
		(4) Certainty markers
		(5) Attributors
		(6) Attitude markers
		(7) Commentary
			(6) Hedges
			(7) Emphatics
			(8) Attitude markers
			(9) Relational markers
			(10) Person markers

As Table 2.1shows, the broad approach to metadiscourse is primarily represented by researchers such as Vande Kopple (1998), Crismore et al. (1993), and Hyland (1998c), who view metadiscourse as consisting not only of textual aspects but also of interpersonal aspects. These researchers have consistently made a distinction between textual and interpersonal metadiscourse although they may disagree on the specific functions and classifications within each basic type. Typically, the function of textual metadiscourse is to organize the text and to guide the reader towards a preferred interpretation of the propositional content, and the primary function of interpersonal metadiscourse is to express the writer's evaluation and stance towards the propositional

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materials. Such a division seems to flow from the textual and interpersonal meta-functions in Halliday's (1994) systemic functional grammar (SFG), and thus this approach is also referred to as the "SFG-inspired model" by Ädel (2006, p.16). However, as I shall discuss in the next section, Hyland (2005b, see also Hyland & Tse, 2004) has rejected such a division between textual and interpersonal metadiscourse and proposed that all metadiscourse is interpersonal in orientation.

In comparison, the narrow or non-integrative approach focuses on a variety of textual features variously termed as "metatext" (Mauranen, 1993a, p.7; see also Ädel, 2006; Bunton, 1999; Valero-Gracès, 1996). A summary of the representative analytical schemes of the narrow approach is presented in Table 2.2.

Table 2.2

Analytical Schemes of Metadiscourse in the Narrow Approach

	Mauranen (1993a)	Bunton (1999)	Ädel (2006)
Categories	(1) Connectors	(1) Text references	(1) Metatext
	(2) Reviews	a. previews	a. impersonal
	(3) Previews	b. reviews	b. personal
	(4) Action markers	c. overviews	(2) Writer-reader
		(2) Non-linear text	interaction
		references	
		(3) Inter-text references	
		(4) Text act markers	
		(5) Text connecters	
		(6) Text glosses	

According to Mauranen (1993a), the function of metatext is "to organise and comment on the discourse, particularly the propositional content that is being conveyed" (p. 9). Altogether four kinds of textual features are included in her classification system: connectors (e.g., *however, as a result*), reviews (e.g., *the above argument ignores…*),

previews (e.g., *we show below that…*), and action markers (e.g., *to express this argument in notation*).[1] The same taxonomy was later adopted by Valero-Gracès (1996) in her contrastive study of Spanish and English economic texts and was further revised by Bunton (1999) in his study of doctoral theses. For researchers who adopt the narrow approach, it may be easier to identify metadiscourse items by restricting it to only text-reflexive features for organizing texts. However, as Ädel (2006) argues, in so doing they may leave out two important components of the writing process: the writer and the reader. Thus, she claims to adopt a middle ground approach by proposing an alternative model of metadiscourse based on a critique of the SFG-inspired models (Ädel, 2005, 2006).

Ädel's model of metadiscourse is derived from Jakobson's (1960) metalinguistic, directive and expressive functions of language, and she defines metadiscourse as "text about the evolving text, or the writer's explicit commentary on her own ongoing discourse" (Ädel, 2006, p.20). In her model, Ädel has distinguished two categories of metadiscoursal expressions: the "metatext" and the "writer-reader interaction". The metatext means "the writer's (and /or the reader's) discourse acts, or refers to aspects of the text itself, such as its organization and wording, or the writing of it" (Ädel, 2006, p. 36). For example, when writers introduce a topic or state a purpose, they make comments on their own discourse acts by using metatext (e.g., *we must now consider the pros and cons of …*)[2]. The category of "writer-reader interaction" refers to "linguistics expressions that are used to address reader directly, to engage them in a mock dialogue" (Ädel, 2006, p. 37). For instance, one way writers show awareness of

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[1] All examples provided in the parentheses are from Mauranen (1993a).
[2] The examples of "metatext" and "writer-reader interaction" are taken from Ädel (2006).

their readers is to anticipate their response by using metadiscursive expressions (e.g., *Let me tell you the truth; why do I draw this conclusion? Let's first make a definition of...*).

By focusing on the central notion of "reflexivity" (Ädel, 2006, p.19), Ädel has chosen to delimit metadiscourse by including only those features concerned with the world of discourse. Other linguistic features like "stance markers" which explicitly "express the speaker's attitude towards what is said" (p.38) are excluded because they are concerned with the real world out there. For example, expressions which signal the writer's doubt or certainty, agreement or disagreement, belief or disbelief (e.g., *I am convinced that; I agree; I suppose*), according to Ädel, display attitudes to phenomena in the real world rather than the world of written discourse and therefore should be excluded from metadiscourse. This is considered to be a crucial difference between her own position on metadiscourse and the positions of the broad approach. According to Ädel (2006), a greater emphasis on reflexivity in her model allows researchers to make a distinction between the world of discourse and the world of reality. A restriction of metadiscourse to the former is likely to avoid the dichotomy between metadiscourse and propositional material as well as to limit the scope of the broad approach which includes a range of heterogeneous textual and interpersonal features. On the other hand, her model also differs from the other positions in the narrow approach because the latter only focus on metatext or the function of guidance in written text, whereas hers also foregrounds the function of interaction by the inclusion of writer-reader interaction restricted to the world of discourse.

Despite Ädel's (2006, p.180) claim of a "middle ground" position, I tend to group her model of metadiscourse with the narrow approach because of its strong emphasis on

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text-reflexivity. The difference between the broad and the narrow approach, according to Ädel and Mauranen (2010, p.2), is that whereas the former sees "textual interaction" as fundamental to the approach, the latter sees "reflexivity" as fundamental to the approach. In other words, a key distinction is that the narrow approach emphasizes on the reflexivity of language use, and hence excludes the writer's evaluation or stance from the scope of metadiscourse (Ädel, 2006). As a result, some linguistic resources such as hedges, boosters and attitude markers which are legitimate in the broad approach to metadiscourse are excluded by the narrow approach. In spite of such difference, both the broad and the narrow approach perceive metadiscourse as consisting of two basic functions: guiding readers through text and interacting with readers. For instance, while Ädel (2006) distinguishes between "metatext" and "writer-reader interaction" (p. 20), Hyland's (2005b; see also Hyland & Tse, 2004) interpersonal model of metadiscourse draws a similar distinction between "interactive" and "interactional" functions (p.49). A more detailed description of Hyland's model is provided in the following section.

2.3 A Critical Appraisal of Hyland's Interpersonal Model of Metadiscourse

Based on previous theoretical and empirical explorations of metadiscourse (e.g., Crismore et al, 1993; Hyland, 1998c; Vande Kopple, 1985, 2002), Hyland has proposed a revised model of metadiscourse which emphasizes the social interactions between writer and reader (Hyland, 2005b; Hyland & Tse, 2004). Hyland (2005b; Hyland & Tse, 2004) has theorized about metadiscourse by drawing on Sinclair's (2004) model of planes of discourse and defines metadiscourse as "the cover term for the self-reflective expressions used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular

community" (2005b, p. 37). This definition links writer/speaker, text/discourse, and reader/audience within particular discourse communities and focuses on the interactional mechanism in communication.

In this model, Hyland lays down some key principles for delimiting and identifying metadiscourse. These include: (a) metadiscourse is distinct from propositional discourse; (b) metadiscourse embodies writer-reader interaction in texts; and (c) metadiscourse distinguishes between internal and external relations (Hyland, 2005b; Hyland & Tse, 2004).

With regard to the first principle, as already discussed in the previous section, Hyland (2005b) maintains that it is necessary to draw a proposition-metadiscourse distinction because propositional discourse is concerned with "things in the world" whereas the metadiscourse refers to "things in the discourse" (p.38). Moreover, the use of metadiscourse is seen by Hyland as "integral to the process of communication and not mere commentary on propositions" (2005b, p.41). Thus metadiscourse is a specialized type of discourse but not a secondary one as compared with propositional discourse. Although maintaining a distinction between metadiscourse and propositional discourse is important, as noted by some, there are challenges in applying this principle to textual analysis. One issue, as pointed out by Thompson (2008), is that "it is not always a straightforward matter to decide exactly what counts as metadiscourse in a text" (p. 138). The distinction between metadiscourse and propositional discourse is particularly problematic with respect to interactional metadiscourse. For example, Khabbazi-Oskouei (2013) takes issue with the following instances of metadiscourse identified in Hyland's (2005b, p.150) analysis of RAs:

a) The first clue of this emerged when we noticed a quite <u>extraordinary</u> result.

b) Homicide followed by suicide has been a <u>neglected</u> area in criminological theory and research. The work that exists is marked by a series of methodological limitations, such as <u>small</u> samples and lack of systematic multivariate analysis.

Where Hyland (2005b) regards the underlined parts as attitudinal markers (a main type of metadiscourse) which express writers' evaluative stances, Khabbazi-Oskouei (2013) argues that the function of those evaluative expressions is to "qualify people, things or events in the real world rather than within the proposition[discourse]" (p.99) and therefore should not be counted as metadiscourse. The disagreement arises because although attitudinal adjectives such as *extraordinary*, *neglected*, and *small* in the above examples are clearly evaluative, they may not function as metadiscourse in these contexts. As Hyland (2005b) acknowledges, when evaluative expressions are used to "qualify individual items" rather than "provide an attitudinal or evaluative frame for an entire proposition", they should be "excluded as metadiscourse because they do not function in relation to an entire proposition" (p.31).

Similar issues also arise with regard to the identification of hedges. In the hedging literature, a distinction has been made between two types of hedging expressions: shields and approximators (Prince, Frader, & Bosk, 1982). Whereas shields concern the relationship between the speaker /writer and the propositional content (e.g., *perhaps*, *possibly*), approximators express semantic fuzziness within a proposition proper (e.g., *somewhat*, *sort of*). Although Hyland (1998a, 1998b, 2005b) obviously includes both shields and approximators as hedges, it is questionable whether the latter can constitute prototypical hedges which "withhold complete commitment to a proposition" (Hyland, 2005b, p.52). For some researchers, such as Crompton (1997), only shields qualify as hedges, whereas approximators do not reflect the writer's lack of commitment to

proposition, and are simply short-hand devices when no exact quantification expressions are available. Thus, including approximators as hedges may further blur the boundary between metadiscourse and propositional content.

One possible way to address the above challenges in identifying and classifying metadiscourse is to supplement a purely functional approach to metadiscourse with some syntactic references (cf. Khabbazi-Oskouei, 2013; Markkanen, Steffensen, & Crismore, 1993).With respect to attitudinal adjectives, for example, only the adjectival expressions that could be separated from the main message or proposition in clauses by using punctuation marks or impersonal structures, such as *it is (adjective)that*, are counted as metadiscourse (Khabbazi-Oskouei, 2013). In other words, metadiscourse are those elements "whose function in the first place is to allow writer intrusion between the propositional content and the readers" (Markkanen et al., 1993, p.142). With this syntactic criterion, adjectival expressions in Examples a and b (i.e., *extraordinary*, *neglected*, and *small*) should be excluded from metadiscourse in their respective contexts. In a similar way, in the case of hedges, shields are typically separate from propositional content and are used to explicitly qualify a writer's commitment, and thus constitute prototypical metadiscourse. In contrast, approximators are mainly used within propositions to "sharpen or soften the boundaries between experiential categories" such as quantity (e.g., *roughly*), degree (*somewhat*), and frequency (*often*), whose "*core* function is semantic, notably, covering for lack of specific information or giving the right representation of reality" (Lafuente-Millán, 2008, pp.69-70, italics in original). Thus, approximators are primarily propositional and should not be included as part of metadiscourse despite the fact that some of them can reduce the writer's commitment to propositions and overlap with shields in terms of function (Lafuente-Millán, 2008). In

the latter case, a syntactic criterion is necessary for a case-by-case contextual analysis of such approximators to decide whether they should be included as metadiscourse.

Regarding the second principle, Hyland argues that all metadiscourse involves the writer-reader interactions and the conventional textual-interpersonal "duality" should be abandoned (Hyland, 2005b, p.41). Hyland points out that although the separation between textual and interpersonal metadiscourse obviously echoes the textual and interpersonal meta-functions in Halliday's (1994) systemic functional grammar theory, the notion of metadiscourse "plays no part in his [Halliday's] thinking" (Hyland & Tse, 2004, p. 161). In addition, previous theoretical work on metadiscourse has not strictly followed a functional grammar or Halliday's idea that the ideational, interpersonal, and textual functions work simultaneously in the same text. Hyland notes that it is difficult to keep the two types of metadiscourse apart in practice because textual resources cannot work on a level separate and independent from either the ideational or interpersonal aspects. According to systemic functional grammar theory (Halliday, 1994; Halliday & Matthiessen, 2004), ideational, interpersonal and textual functions are realized as a whole, and linguistic choices are often multifunctional. A case in point is the use of transitions or conjunctions in texts. Although they are typically referred to as "text connectives" (Vande Kopple, 1985, p.83) or as part of "textual markers" (Crismore et al., 1993, p.47) in the earlier metadiscourse literature, Hyland (2005b) claims that these metadiscoursal markers can be seen as orienting towards either the ideational or interpersonal meanings. It is classified as a subtype of textual metadiscourse largely due to humans' perceptive tendency towards the experiential world; that is, we tend to regard conjunctions as connectives between ideas. Nevertheless, as Hyland points out, "we can also see conjunctions as interactionally motivated, contributing to the creation

and maintenance of shifting interpersonal orientations" (Hyland & Tse, 2004, p. 163; for a similar discussion, see also Thompson & Zhou, 2000). In short, the so-called "textual metadiscourse" in the earlier metadiscourse literature is "actually another aspect of the *interpersonal* features of a text", and "[I]t concerns decisions by the writer to highlight certain relationships and aspects of organization to accommodate readers' understandings, guide their reading, and make them aware of the writer's preferred interpretations" (Hyland, 2005b, p.45). Therefore, Hyland (2005b) revises his early view on a division of textual and interpersonal metadiscourse (see Hyland, 1998c) and argues that all metadiscourse fundamentally embodies social interactions between writer/speaker and reader/listener.

The third principle concerns the question of whether metadiscourse is oriented to the internal discourse or the external world, in other words, whether it represents relationship between elements within the text itself (interpersonal/metadiscoursal) or relations outside the text (ideational/propositional) (Mauranen, 1993b). A case in point is, again, the use of conjunctions/connectives, which have been referred to variously as "connectors" (Mauranen, 1993b, p.162), "linking adverbials" (Biber, Johanssan, Leech, Conrad, & Finegan, 1999, p.875), or "logical markers" (Mur-Dueñas, 2009, p.247). In terms of systemic functional grammar, conjunctions can be distinguished into external and internal types (Halliday & Hasan, 1976; Martin & Rose, 2007). External conjunctions, as Martin and Rose (2007, p.116) suggest, construe experience as "logically organized sequences of activities" (e.g., *and*, *besides*, *whereas*, *although*, *as soon as*, *in case*), whereas internal conjunction presents discourse as "logically organized waves of information" (e.g., *furthermore, similarly, conversely, in conclusion,*

nevertheless).[3] In terms of syntactic structure, internal conjunctions are more or less encoded through "paratactic" and "cohesive" relations, that is, an equal relation between two independent clauses (Martin & Rose, 2007, p.121); in comparison, external conjunctions can be encoded through not only paratactic and cohesive relations but also "hypotactic" relations where an independent clause is connected with a dependent clause (p. 121). Obviously, Hyland (2005b) has made a similar distinction by drawing on Martin's (1992) work:

> [connective items] they can function to either connect steps in an exposition (internal), organizing the *discourse* as an argument, or they can connect activities in the world outside the text (external), representing *experiences* as a series of events (Martin, 1992). (p.45, emphasis in the original)

Based on this distinction, Hyland (2005b) suggests that only transitional markers, that is, those connectives used to link arguments, can express metadiscoursal functions.

While Hyland (2005b) apparently delimits the scope of metadiscoursal transitions to discourse-internal devices, I would suggest that it is sometimes challenging to apply this criterion in actual analysis. For instance, although Hyland (2005b) himself defines transitions as expressing "relations between main clauses" (p.49), he seems to relax it somewhat in actual textual analyses. For instance,

> c) It's hard to discuss 'intelligence' <u>because</u> so-called 'intelligence tests' measure only certain abilities. (Hyland, 2005b, p.167)

In terms of syntactic structure, it is clear that *because* in Examples c above connects an independent clause with a dependent clause, rather than between two main clauses. Even though Hyland (2005b) argues that "what is important is not whether a sentence

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[3] It should be noted that some of these conjunctions can express both internal and external relations depending on particular contexts of use.

becomes ungrammatical if an item is removed, but the function that item is performing in the sentence" (p.35), it may not be immediately obvious that the use of *because* in the above example is discourse-internal. Although *because* can occasionally be used to encode discourse-internal relations, as pointed out by Martin (1992, p. 192) and Thompson (2014, p.200), the internal relations of interest in this thesis are what has been referred to as "cohesive", namely, "connections between clause complexes", rather than "hypotactic conjunctions" (Martin, 1992, p.207). Since metadiscoursal transitions are used to construct logical arguments rather than worldly activities, they overlap to a great extent with internal conjunctions where an equal relationship between clauses prevails. By this criterion, *because* in Example c may not be part of metadiscoursal transitions. To maintain consistency in applying the discourse-internal principle, some researchers (e.g., Gardezi & Nesi, 2009; Mur-Dueñas, 2009) propose to delimit metadiscoursal transitions to inter-sentential cohesive devices because they are more explicit indicators of logical relationships between discourse units. For instance, Mur-Dueñas (2009) restricts her analysis to "only logical markers which join two main clauses and which are most frequently separated from the rest of the discourse by punctuation marks" (p. 250). Likewise, in Gardezi and Nesi (2009), only inter-sentential conjunctions have been included, whereas "any markers of addition, comparison, or consequence relating to the outside world" have been excluded (p.241). Thus, with regard to transitional markers, the present study similarly adds a supplementary syntactic criterion to Hyland's principle by focusing only on discourse-internal, inter-sentential transitions.

In a similar vein, metadiscoursal resources such as sequencers (e.g., *firstly*, *next*, *finally*) can either function as organizers of activities that happen in the real world or

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represent steps in argument internal to the discourse. Only when those sequencers are used as organizers of arguments can they be classified as metadiscourse because they function as reflexive references to the text itself. For instance, in the sentence "they were first asked to assess a series of scenarios, then to comment on the characteristics of 'good' research" (APL/MM01)[4], *first* and *then* are used as temporal sequencers which are external to the discourse and therefore should not be seen as metadiscoursal. By comparison, similar expressions should be considered as metadiscoursal in the discourse segment "however, several limitations should be considered. *First*, CBASP is an integrative treatment. … *Second, …*" (PSY/QUAN08). Sequencers in the latter example are metadiscoursal because expressions like *first* and *second* here denote discourse-internal meaning and are used to connect steps in an argument rather than real world activities.

The same internal-external distinction is also drawn by Ädel (2006), who maintains that "a basic question to keep in mind when analysing data is whether the focus is on the ongoing discourse or on the other, 'worldly', activities or phenomena that are external to the text" (p.28). In general, the internal versus external distinction can be a useful criterion in the identification of metadiscourse in texts.

Despite the criticisms to his framework, Hyland (2005b) proposes to categorize metadiscourse into two types: interactive and interactional metadiscourse. Table 2.3 presents the various categories, their main rhetorical functions, and illustrative

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[4] In this thesis, I use the following notation system for examples taken from the corpus: APL, EDU, and PSY stand for applied linguistics, education, and psychology; QUAL, QUAN, and MM stand for qualitative, quantitative, and mixed methods research paradigms; numerical numbers represent the coded RAs. For instance, APL/MM01 means the first RA in the mixed methods subcorpus for the discipline of applied linguistics.

examples.

Table 2.3

Hyland's Interpersonal Model of Metadiscourse

Categories	Functions	Examples
Interactive		
Transitions	Express relations between main clauses	*in addition; but; thus; and*
Frame markers	Refer to discourse acts, sequences or stages	*finally, to conclude; my purpose is,*
Endophoric markers	Refer to information in other parts of the text	*noted above; see Fig; in section 2*
Evidentials	Refer to information from other texts	*according to X; Z states*
Code glosses	Elaborate propositional meanings	*namely; e.g.; such as*
Interactional		
Hedges	Withhold commitment and open dialogue	*might; perhaps; possible*
Boosters	Emphasize certainty or close dialogue	*in fact; definitely;*
Attitude markers	Express writer's attitude to proposition	*unfortunately; I agree;*
Self mentions	Explicit reference to author (s)	*I; we; my; our;*
Engagement markers	Explicitly build relationship with reader	*consider; note; you can see that*

From an interpersonal point of view, interactive metadiscourse is concerned with the writer's awareness of participating audience and their needs and expectations. As Hyland (2005b) points out, interactive metadiscourse is "clearly not simply text-organizing" but is "a consequence of the writer's assessment of the reader's assumed comprehension capacities, understanding of related texts, and need for interpretive guidance, as well as the relationship between the writer and reader" (p. 50). This suggests that the deployment of interactive metadiscourse is sensitive to how much

the writer understands his/her readers in the rhetorical contexts. Interactive metadiscourse includes five subcategories of linguistic resources: transitions, frame markers, endophoric markers, evidentials, and code glosses. Interactional metadiscourse represents a writer's explicit presence in the text and his/her interaction with potential readers. This type of metadiscourse allows the writer to intrude into the text and express his/her views or evaluate propositional information. Through the use of interactional metadiscourse, the writer can involve readers by anticipating their likely responses to the message and to engage them in a dialogue. Interactional metadiscourse also includes five subcategories of linguistic resources: hedges, boosters, attitude markers, self-mentions and engagement markers, as shown in Table 2.3.

To sum up, Hyland's (2005b) model represents an essentially functional approach to metadiscourse. This model of metadiscourse is more inclusive as compared with those of the narrow approach and has been widely applied in metadiscourse research since its inception, particularly in the study of academic texts. For example, recent years have seen a multitude of investigations into interactive and/or interactional metadiscourse of various academic genres (e.g., Abdi et al., 2010; Del Saz-Rubio, 2011; Hyland, 2005c; Khedri, Heng, & Ebrahimi, 2013; Lafuente-Millán, 2014; Li & Wharton 2012; McGrath & Kuteeva, 2012; Peterlin, 2005). However, because of the fuzzy and multifunctional nature of metadiscourse, there are a few challenges in applying this model to actual textual analysis, particularly in distinguishing metadiscourse from propositional discourse. To tackle these challenges, I would suggest the inclusion of two supplementary syntactic criteria. The first one concerns whether a potential metadiscoursal item qualifies an entire proposition or simply modifies some individual elements within that proposition. This criterion applies to most interactional

metadiscourse, particularly hedges, boosters, and attitude markers. The second criterion addresses whether a potential interactive metadiscoursal item encodes a discourse-internal or a discourse-external relationship. This criterion applies to most interactive metadiscourse, particularly transitional markers and endophoric markers. These additional criteria will not only facilitate the analytical process but contribute to the analytical coherence of the model of metadiscourse. Thus, the present study modified Hyland's model of metadiscourse and adapted it for my own purpose of investigating metadiscourse in the post-method RA sections. The modified model will be laid out in detail in Chapter 4.

2.4 Metadiscourse in Academic Writing

In recent years, there have been an increasing number of empirical studies focusing on the use of metadiscourse in written communication, particularly in academic writing. This is not surprising given a growing awareness of the importance of writer-reader interactions in academic texts which appear to be detached, objective, and impersonal. The role of metadiscourse in constructing academic knowledge has been well recognized in the fields of discourse analysis, English for academic or specific purposes, as well as studies of academic literacies. There are generally three broad analytical perspectives informing research on the use of metadiscourse in academic writing: cross-generic, cross-cultural, and cross-disciplinary (Lafuente-Millán et al., 2010). Due to a shortage of cross-paradigmatic research on metadiscourse, it is not possible to provide a review of such research, and hence it is perceived as one important research gap in this thesis. However, the related literature on differences between academic writing produced in different research paradigms will be reviewed in Sections 3.2.5 and 3.2.6. In this section, I will present a focused review of the relevant literature on

metadiscourse from the cross-generic and cross-disciplinary strands of research.

2.4.1 Cross-generic research on metadiscourse

An important strand of research on the use of metadiscourse in academic writing compares different genres in academic communication. A genre, as noted in Section 1.1.2, is "a class of communicative events" (Swales, 1990, p.58) used by members of a particular discourse community to substantiate their shared communicative purposes. The shared communicative purposes not only shape the "schematic structure of the discourse" but constrain the choice of "content and style" (p.58). In other words, genres are conventional, socially recognized ways of using language in particular contexts. Genre analysis of academic or professional writing has been a major area of research over the past few decades in the field of applied linguistics (e.g., Bhatia, 1993; Swales, 1990).

In relation to research on metadiscourse, a variety of written genres, ranging from non-academic to academic, have been studied in recent years. The non-academic genres include science popularizations (Crismore & Farnsworth, 1990; Hyland, 2010a), written advertisement (Fu, 2012; Fuertes-Olivera, Velasco-Sacristán, Arribas-Baño, & Samaniego-Fernández, 2001), and media reports (Dafouz-Milne, 2008). Predominantly, metadiscourse research on academic writing has focused on RAs and part-genres of RAs (e.g., Abdi et al, 2010; Abdollahzadeh, 2011; Dahl, 2004; Del Saz-Rubio, 2011; Gillaerts & Van de Velde, 2010; Hyland, 1998a. 1998b, 1998c, 2005c; Hu & Cao, 2011; Khedri et al., 2013; Loi & Lim, 2013; McGrath & Kuteeva, 2012). Other investigated genres include book reviews (Moreno & Suárez, 2008; Itakura & Tsui, 2011), textbooks (Bondi, 2010; Crismore, 1984; Kuhi & Behnam, 2011), dissertations (Bunton, 1999, Hyland, 2004), undergraduate project reports and essays (Hyland, 2002c; Li & Wharton,

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2012), as well as some peripheral and genres such as academic weblogs (Luzón, 2010) or such occluded genres as referee reports (Fortanet-Gómez & Ruiz-Garrido, 2010).

In the following section, I will limit my review to several key cross-generic studies involving a few commonly encountered genres such as RAs, textbooks, science popularizations, and undergraduate student project reports. This focusing is to highlight how the genre of RAs, the focal genre in the present study, differs from other genres in the use of metadiscourse.

In a recent comparative study of academic genres in the field of applied linguistics, Kuhi and Behnam (2011) adopted Hyland's (2005b) analytical framework and examined the use of metadiscourse across the genres of RAs, handbook chapters, scholarly textbook chapters, and introductory textbook chapters. The analyses showed considerable variation in the frequency and the distribution of both interactive and interactional metadiscourse features across the genres. A most notable contrast was found between the RAs and the introductory textbooks in the use of various metadiscoursal resources. As far as the use of interactive metadiscourse is concerned, the RAs contained more evidentials and displayed manifest intertextuality, whereas the textbooks relied more on comprehension facilitators such as transitions, code glosses, frame markers, and endophoric markers. Disparity between these two genres was also found in the relative frequencies of interactional metadiscourse. Where the RAs used hedges and self-mentions more frequently, the relative frequencies of reader pronouns, and directives were much higher in the introductory textbooks. The observed variation in the incidence and relative prominence of different subcategories of metadiscourse between the RAs and the textbooks, as suggested by Kuhi and Behnam (2011), can be related to the different communicative functions of the two genres which are influenced

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by various socio-cultural and institutional factors. For instance, the greater prominence of engagement markers such as reader pronouns and directives in the textbooks suggested authoritative, non-argumentative, and unequal power relations between textbook writers and readers. By contrast, more frequent occurrence of hedges and self-mentions in RAs indicated the authors adopted a more prudent stance in order to engage with readers in a relatively equal power relationship. In addition, the results from this study also indicated that the handbook chapters and the scholarly textbook chapters were hybrid in metadiscourse use. In some respects, these genres displayed similarity with the RAs and in other respects, they resembled the introductory textbooks. Kuhi and Behnam (2011) thus contended that it would be more appropriate to view rhetorical variations in those genres as a continuum rather than as a polarity. In short, according to these two authors, the variations across the genres indicated that different communicative goals, epistemological assumptions, audiences, funding sources, and knowledge-making practices of academic communities worked together to shape the use of the metadiscoursal features in academic texts.

In a similar cross-generic comparative study, Hyland (2002c) focused on the use of a specific subcategory of interactional metadiscourse, directives, in a corpus of published RAs, textbooks, and L2 student project reports. The results showed that the use of directives varied, in both relative frequency and discourse functions, with the writers' rhetorical purposes and their sensitivity to readers across these genres. Firstly, the quantitative results showed that both the textbooks and the RAs used more directives than the student reports. The high incidence of directives in these two genres, according to Hyland (2002c), was a function of the writers' efforts to guide readers as learners through texts or to persuade them as peers to accept new knowledge claims. In

contrast, the student reports were written for readers with high authority such as supervisors or examiners, and thus using directives in this genre was risky. Secondly, in terms of discourse functions, while the student reports employed mainly textual directives (e.g., *see section 1; refer to example 2*), the textbooks and the RAs relied more on cognitive directives (e.g., *this should be seen as; remember*). Hyland (2002c) related the difference in the proportion of cognitive directives between the RAs and textbooks on the one hand and the student reports on the other to their relative status in power relations. Due to their less powerful status, the students may have employed fewer cognitive directives to reduce the imposition on their readers, who were perceived as more powerful as compared with the students.

Another specific difference concerning the use of textual directives was found to exist between the textbooks and the student reports on the one hand and the RAs on the other. A functional analysis indicated that both the textbooks and the student reports tended to use textual directives primarily to refer to the other sections of a text, whereas the RAs were more likely to use textual directives to guide readers to the supporting literature. The variation in the functions of directives across these genres, as Hyland (2002c) suggested, was "intimately related to their assessments of appropriate reader-relationships in different generic and disciplinary contexts" (p. 236). Therefore, Hyland (2002c) concluded that academic writing is both individual and institutional, and that a writer's use of specific rhetorical strategies in a particular genre should be consistent with the rhetorical conventions of the particular community he/she belongs to.

Parallel to the comparative studies of RAs and textbooks, another strand of cross-generic research has examined scientific RAs and science popularizations from a

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comparative point of view. Science popularizations have different readership from textbooks. Whereas textbooks are addressed to particular student populations, popular science writings target more widely at the general public. In an early exploratory study of metadiscourse, Crismore and Farnsworth (1990) compared a science RA with a popular science article on the same biological topic, and found notable differences in the use of metadiscoursal features including hedges, emphatics, and commentaries. Overall, more metadiscourse was used in the RA written specifically for a professional scientific audience as compared with the popular science article written for the general public. Crismore and Farnsworth also noted that although hedges were frequently used in both texts, they had a stronger presence in the RA. They therefore concluded that hedging was "the mark of a professional scientist" (1990, p.135) who did science and wrote on science with caution. Although this study compared only two articles, the disparities in metadiscourse use pointed to different ways the authors positioned their audience and themselves.

A similar comparison of professional and popular science articles was recently carried out by Hyland (2010), who compared how writers manipulated rhetorical features to display both their authority and their interaction with readers. Based on the assumption that different purposes and audiences of the two genres may influence the ways writers negotiate interpersonality and represent scientific knowledge, Hyland compared 120 RAs from four science and engineering fields with 120 popular science articles in the use of a range of metadiscourse markers. The findings showed interesting cross-generic differences in the use of hedges, attitude markers, personal pronouns, and questions. Consistent with previous findings in Crismore and Farnsworth (1990), the RAs in Hyland's dataset contained abundant hedges to convey a degree of caution or

tentativeness, whereas the popularizations had fewer hedges and favored unmodified or boosted assertions. According to Hyland (2010), this difference was due to knowledge transformation from research into popular science, which involves "removing doubts and upgrading the significance of claims to emphasize their uniqueness, rarity or originality" (p. 124). The use of personal pronouns also showed variations between the two genres. While the inclusive *we* was widely used in both the RAs and the popularizations, reader references such as *you* rarely occurred in the RAs. In addition, the use of questions, which bears the dialogic imprint, almost never occurred in the science and engineering RAs, although they were common engagement devices in the popularizations. This indicated that these two genres were designed for distinct audiences, namely experts versus the general public, who had different goals, interests, knowledge backgrounds, and processing abilities.

In summary, the comparative studies have revealed various rhetorical disparities in the use of metadiscourse across different genres in academic and non-academic contexts. Such differences can be attributed to a range of social and institutional factors which could, to different extents, influence the texts produced in various contexts. Compared with other genres, the genre of RA appears to be more likely to use certain types of metadiscourse, for example, hedges and evidential markers. Due to its prestige and importance in academy, the RA genre has also attracted considerable research attention and has become a focal genre for metadiscourse research from cross-cultural and cross-disciplinary perspectives.

2.4.2 Cross-disciplinary research on metadiscourse

2.4.2.1 Interaction of cultural and disciplinary influences

The term of 'culture' in academic writing research can have two distinct senses. First, culture is normally understood as "received culture" or national culture native to a country or state (Atkinson, 2004, p.277). This sense of culture is reflected in many studies of contrastive rhetoric where the rhetorical choices made by writers will inevitably be influenced by cultural norms, values, and belief systems prevailing in particular sociocultural contexts (e.g., Connor, 1996; Kaplan, 1966). Second, in cross-disciplinary research the same term could be used to refer to professional, disciplinary culture (Atkinson, 2004). It has been observed that in academic writing the cultural and disciplinary cultures often interact and jointly shape the discourse structures and rhetorical strategies, particularly those of RAs (Fløttum et al., 2006; Yakhontova, 2006). Metadiscourse, as part of writing conventions, seems also under such joint influences. A natural question to ask, however, is which plays a more prominent role in academic writing, culture or discipline? There seems to be no easy answer to this question since the findings reported in the previous research are sometimes inconsistent or even contradictory. For example, the main purpose in Dahl's (2004) doubly contrastive study of metatext in three languages (French, English and Norwegian) and three disciplines (economics, linguistics, and medicine) was to see whether the language or the discipline was the most important variable in shaping metatext in RAs. The findings indicated two different answers. On the one hand, in the fields of economics and linguistics, language and cultural conventions in writing seemed to be more influential. For example, whereas authorial presence was more visible and explicit in the English and the Norwegian texts, the French texts seemed to favor a more implicit

authorial presence. On the other hand, in the field of medicine there seemed to be little difference among the three languages regarding authorial presence, indicative of metatext as a marker of academic discipline rather than a national culture.

In another study which overlapped with Dahl's (2004) in both languages and disciplines (except for economics), Vold (2006) found little disciplinary difference but significant cross-linguistic differences. It is worth noting that the metadiscoursal features examined in these two studies were different, which may partly explain the inconsistencies of the findings. In Dahl's (2004) study, it is the so-called "locational" or "rhetorical" metatext (p.1811-12) that was investigated. Vold's (2006) study, however, focused on a selected list of epistemic markers. This suggests that the interrelationship between culture and discipline is complex, with different factors weighing differently on different metadiscoursal features. To assess each variable's unique contribution to metadiscourse use in academic writing, it is necessary to untangle such intertwined cultural and disciplinary factors. Therefore, the present thesis attempts to focus on the disciplinary factor in the context of RAs produced and published in the English language.

With respect to the use of metadiscourse in RAs, a plethora of studies have compared how different disciplines, particularly between the natural sciences and the humanities/social sciences, deployed these features in presenting their arguments and persuading their readers. In what follows, the thesis will provide a review of this body of literature in relation to both interactional and interactive metadiscourse.

2.4.2.2 Interactional metadiscourse across disciplines

One key finding from cross-disciplinary research on the use of metadiscourse in

RAs is the broad contrast between the hard and the soft disciplines, particularly with regard to writer stance and engagement with readers (Hyland, 2005c, 2006). Writer stance expresses the writer's textual voice and can be signaled primarily in RAs through metadiscoursal resources such as hedges, boosters, attitude markers, and self-mentions.

For example, in a corpus-based study of 240 RAs from eight disciplines across the hard and the soft spectrum, Hyland (2005c) investigated a range of metadiscoursal features in his framework of stance and engagement. The results showed that the writers from the different disciplinary communities used these interactional markers in different ways: those in the humanities and social sciences, such as philosophy and applied linguistics, tended to adopt more "explicitly involved and personal positions" (Hyland, 2005c, p.187) than those from the natural sciences such as engineering and physics.

Similar findings were also reported regarding specific types of interactional metadiscourse, such as hedges, boosters, and attitude markers. Abdi (2002) compared the use of three types of interactional metadiscourse (hedges, boosters, and attitude markers) in the discussion sections of 40 RAs in the natural sciences and the social sciences. The results showed that although there were no significant differences between the natural science and the social science writers in using boosters, they differed clearly in using hedges and attitude markers, with the social scientists showing more uncertainty and subjective evaluation in the texts. In an earlier study of 56 RAs from the same eight disciplines, Hyland (1998a) reported a far greater incidence of both hedges and boosters in the soft disciplines than in the hard ones for mitigating or reinforcing the writers' commitment. Other studies corroborated Hyland's (1998a) results about the discipline-specific use of hedges and boosters in RAs. For example, Vold (2006) compared the use of hedges in 120 RAs across three languages (English,

French, Norwegian) and two disciplines (medicine, applied linguistics) and found both cross-linguistic and cross-disciplinary variations. Overall, hedges in the linguistics RAs were more frequent than those in the medical RAs, although the difference was not statistically significant (Vold, 2006). Peacock (2006) compared the use of boosters in 216 RAs in six disciplines and discovered that the two science disciplines used fewer boosters than the four social science disciplines. However, recently this broad distinction between the soft and the hard knowledge domains has been questioned in favor of more specific comparisons between individual disciplines or subdisciplines (Lafuente-Millán, 2008). In his comparative study of epistemic modality markers in four disciplines from both the soft and the hard domains, Lafuente-Millán (2008) made fine-tuned distinctions between hedges, boosters and approximators to gain a more detailed picture. The results showed that while academic writers from the soft disciplines (i.e., business management and applied linguistics) expectedly used more hedges and boosters, those from urology, which has been typically classified as a branch of medicine and hence a hard discipline, also used a relatively high frequency of hedges. In addition, the frequencies of approximators appeared to be similar in all four disciplines. This may indicate that, as Lafuente-Millán (2008) argued, a straightforward distinction between the soft and the hard disciplines regarding the patterns of use of epistemic modality markers and approximators seems untenable, and further research of a more fine-grained nature is needed.

Apart from expressing doubt and certainty through hedges and boosters, RA writers also explicitly express their affective attitudes towards propositional content through attitude markers (Hyland, 2005b). In Hyland's (2005c) study, the overall proportion of attitude markers is higher in the soft disciplines than in the hard disciplines. Since

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modal verbs of obligation/necessity are often used to indicate a writer's attitude, Giltrow (2005) examined the use of deontic modals (e.g., *must*, *should*) in a comparative study of 105 RAs from the disciplines of forestry, social psychology, and urban geography. The results showed that deontic modals were used equally frequently in the RAs from the three disciplines in expressing knowledge obligations, that is, imposing obligations on researchers in knowledge-making practices. However, in terms of field obligations, namely, the use of deontic modal verbs in obligating professionals to act on research attested knowledge, the social psychology RAs were less likely to use deontic modals than either the forestry or the urban geography RAs.

Another aspect of metadiscourse in RAs which tends to vary among different disciplines is authorial presence (Hyland, 2006). Making explicit self-reference in RAs may be seen as against the tradition of impersonality and objectivity of the genre. Nevertheless, extensive research on the use of self-mentions in disciplinary writing suggests that academic writers often use the first-person pronouns to refer to themselves. In his cross-disciplinary study of 240 RAs, Hyland (2001b) revealed that although there was no apparent hard/soft division in the overall frequencies of self-citations, the use of first-person pronouns in the soft fields was much more frequent than that in the hard fields. A similar hard/soft disciplinary distinction was also observed in Harwood (2005b), who found that the RA writers from physics and computer science made far more frequent use of exclusive *we* than those from business management and economics. In contrast, the writers from the soft disciplines preferred to use singular pronoun *I*, which was rarely used by those from the hard disciplines. As far as the specific forms of first person pronouns are concerned, Lafuente-Millán (2010) discovered in his study of 96 RAs from four disciplines that while the singular pronoun *I* occurred in the RAs of

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business management and applied linguistics, it was not used in the urology and the food technology RAs. In comparison, the incidence of exclusive *we* was very frequent not only in the business management and the applied linguistics RAs but also in the urology RAs. However, the use of the possessive form *our* was more frequent in the two hard disciplines than in the two soft disciplines.

While the use of hedges, boosters, attitude markers, and self-mentions help RA writers to establish authorial stances in texts, the use of engagement markers can help writers relate to their readers (Hyland, 2001a, 2005b). Research on engagement markers in RAs has mainly focused on such metadiscoursal resources as directives and reader references. With respect to the former, researchers such as Swales, Ahmad, Chang, Chavez, Dressen, and Seymour (1998) examined the use of imperatives, the most important subtype of directives, in the RAs from 10 academic disciplines across the hard/soft division. Whereas their results showed no obvious relationship between the use of imperatives and the hard/soft division, it was found that the RAs in statistics, experimental geology, and linguistics, where imperatives occurred most frequently, similarly contained "mathematical, experimental, or illustrative elements, and which, in consequence, may require rather more specific forms of reader-text management" (Swales et al., 1998, p. 103). Likewise, in Hyland's (2001a, 2002c, 2005c) studies of engagement markers in RAs across eight disciplines, no clear patterns along the hard/soft split were reported regarding the use of directives, although the highest proportions of directives were found in the hard sciences. In terms of function, however, it was found that the majority of directives in the science and engineering RAs were physical acts, whereas those in the soft disciplines RAs were textual acts (Hyland,

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2002c). As regards reader references, there seems to be a clear division between hard and soft disciplines. Hyland (2001a, 2005c) has demonstrated that the RAs from the hard disciplines used much fewer reader references, such as inclusive *we*, the second-person pronouns, and the indefinite pronouns, than those from the soft disciplines.

Other engagement markers such as questions, knowledge appeals, and personal asides, although used only sparely in RAs, also appear to differ between the hard and the soft disciplines (Hyland, 2001a, 2002d, 2005c). For instance, Hyland (2002d) investigated the use of questions in 120 RAs, 56 textbook chapters, and 64 student project reports from a range of hard and soft disciplines. The results indicated that across genres, questions were used more frequently in the soft disciplines such as philosophy, applied linguistics, and marketing, as compared with the hard disciplines. This tendency to interact with disciplinary readers in soft disciplines was similarly observed in the use of engagement markers such as knowledge appeals and personal asides (Hyland, 2001b, 2005c). Together, the more frequent use of metadiscursive resources for stance and engagement, as evidenced by previous research, indicated that RA writers in the social sciences and humanities tended to involve themselves more explicitly in the texts and to persuade by engaging more interaction with their readers.

2.4.2.3 Interactive metadiscourse across disciplines

While cross-disciplinary differences along the hard/soft line are more explicit in the use of interactional metadiscourse in RAs, the use of interactive metadiscourse also show similar disciplinary effects (e.g., Dahl, 2004; Hyland, 1999, 2007; Peacock, 2010) For example, Hyland (2007) found in a corpus of 240 RAs marked differences between

the hard and soft disciplines in the use of code glosses, a major type of interactive metadiscourse, for reformulating and exemplifying. Specifically, whereas the hard disciplines used more code glosses to reformulate propositions, the soft disciplines employed more code glosses to offer exemplification. A hard-soft difference was similarly found for another type of interactive metadiscourse, evidential markers, in an earlier study across the same eight disciplines (Hyland, 1999). The findings not only revealed a general prevalence of evidential markers in the soft disciplines over the hard disciplines, but also showed that while non-integral evidential markers (the cited sources were not included as part of syntactic structure) dominated disciplines such as physics or engineering, integral evidential markers (the cited sources constituted part of the syntactic structure) were more frequently found in disciplines such as applied linguistics and philosophy. Moreover, it was found that while all disciplines preferred a summary or paraphrase of the source information, only the soft disciplines quoted directly from the sources. According to Hyland (1999, 2007), such variations in metadiscourse use reflected fundamental differences in constructing and representing knowledge between the two broad knowledge domains.

Research on other types of interactive metadiscourse showed similar patterns of use between the hard and the soft disciplines. For instance, Peacock (2010) compared the use of "linking adverbials" (which overlapped to a great extent with Hyland's (2005b) classification of transitional markers) in 320 RAs across eight disciplines divided into the natural and the social sciences. The results showed a clear tendency for the natural science disciplines to use fewer linking devices than the social science disciplines. Parallel hard-soft differences were also observed with endophoric markers and frame markers, namely, "locational metatext" and "rhetorical metatext" (Dahl, 2004,

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pp.1811-12). Based on a corpus of 180 RAs from three disciplines, Dahl (2004) found that the medicine RAs used the locational and rhetorical metatext far less frequently than the economics and linguistics RAs. These variations were attributed to different ways of arguing and reporting between medicine on one hand, and economics and linguistics on the other (Dahl, 2004). So far it is worth noting that these cross-disciplinary studies of interactive metadiscourse tended to highlight differences between the hard and the soft disciplines. One exception, however, was Khedri et al.'s study (2013), which compared the use of interactive metadiscourse in 60 RA abstracts from economics and applied linguistics and uncovered both similarities and differences. For example, while the distribution of interactive metadiscourse in both disciplines followed a similar hierarchical order, the applied linguistics abstracts used remarkably more interactive metadiscourse than the economics abstracts as a whole and in all types of interactive metadiscourse except for transitional markers.

In summary, the cross-disciplinary studies on the use of metadiscourse have offered a great deal of insights into the different ways the hard and the soft disciplines organize their discourses and generate discipline-specific knowledge. One important finding is that RAs in the hard and soft disciplines have different conventions. While hard disciplines tend to persuade by emphasizing procedures and methods and distancing researchers from arguments, the soft disciplines tend to argue by explicit personal projection and engagement with readers (Hyland, 2005c, 2006).

This contrast in rhetorical practices, according to Hyland (2005b), can be attributed to the different nature and epistemic beliefs of different disciplines. The hard disciplines or the natural sciences are analogous to the "urban" areas of knowledge where there are a great deal of research input (including manpower and funding) and competition

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(Becher, 1989; Becher & Trowler, 2001). The research problems are clearly demarcated and fall typically within well-established research paradigms. Researchers in these disciplines have much shared contexts and normally adopt a cumulative view of knowledge growth where any novel and/or significant contributions to the body of knowledge can be easily recognized. Such a positivistic nature and beliefs of these disciplines, according to Hyland (2005c, 2006) may account for rhetorical choices in the discourses of natural sciences. For instance, the preference for generalizations over individual interpretations in the natural sciences may allow RA writers to make strong claims by using fewer hedges and subjective evaluations (Hyland, 2006). In addition, a highly structured reporting format may reduce the opportunities for natural science RA writers to make explicit personal intrusion into the texts by deploying self-mentions and announcing discourse actions (Hyland, 2005c, Dahl, 2004).

By contrast, soft disciplines, that is, the social sciences and the humanities, are known to be more "rural" and have less shared ground in terms of research problems and paradigms (Becher, 1989; Becher & Trowler, 2001). Thus in the discourses of soft disciplines, RA writers often have to rely on their personal authority and credibility to persuade others to accept their knowledge claims, and subjective interpretation is often given more priority because of a lack of solid evidence (Hyland, 2005c, 2006). These broad differences between the natural and the human sciences may account for the aforementioned discursive practices in soft disciplines (Hyland, 2006). For instance, the more frequent use of both interactive and interactional metadiscourse in RAs from the humanities and the social sciences may arise from the emphasis on individual interpretation in knowledge-making and cooperation between writers and readers (Hyland, 2006).

2.5 Beyond the Hard and Soft Division

A review of previous work in Section 2.4 has shown that the use of metadiscourse in RAs may be subject to a variety of socio-cultural influences. For example, the cross-disciplinary comparisons of the use of metadiscourse have revealed that there exist fundamental differences between the natural sciences on the one hand and the humanities and the social sciences on the other. The previous research has also revealed that the preferences for specific types or subtypes of interactive or interactional metadiscourse in the hard versus soft disciplinary contexts may be closely associated with the epistemological beliefs and practices in those knowledge areas. It thus seems that the broad differences in metadiscourse can be attributed to the distinction between hard versus soft disciplines. The differences in the use of metadiscourse, as Hyland (2006, p.21) suggests, reflect the "epistemic conventions" of the hard and the soft disciplinary communities such as "what counts as appropriate evidence and argument". In other words, the hard and the soft disciplines differ in their underlying assumptions about what can be known and how it can be known, which have resulted in the rhetorical differences in their disciplinary discourses, for instance, the ways of presenting arguments and persuasion in RAs. Despite these findings, a few gaps in knowledge can be identified through a review of prior research on metadiscourse across disciplines.

To begin with, a broad characterization of hard and soft knowledge domains may not offer us deeper insights on how metadiscourse is used within each of these broad areas. For example, the dichotomized classification of the hard and soft disciplines does not appear to be applicable to social science disciplines where all forms of knowledge and discourses are supposed to fall into the soft domain. This broad knowledge domain

deserves special attention because unlike the natural sciences, there are often no agreed-upon research problems, theories, and methods within soft knowledge domain and it is often difficult to draw clear boundaries between individual disciplines within the social sciences (Becher & Trowler, 2001). As a result, individual disciplines within the soft knowledge area would be expected to differ in discursive practices such as generic structures (e.g., Lewin et al, 2001; Lim, 2010, 2011) and various lexico-grammatical features (e.g., Afros & Schryer, 2009; Lindeberg 2004; MacDonald, 1992, 1994). For example, in a comparative study involving three soft disciplines (i.e., psychology, history, and literary studies) MacDonald (1992, 1994) found differences in the use of grammatical subjects across the disciplinary texts. Specifically, whereas the psychology RAs used more epistemic subjects, those of history and literary studies used more phenomenal subjects. According to the researcher, such sentence-level differences reflected more profound differences across disciplines in knowledge-making. In a similar vein, Afros and Schryer (2009) discovered that the use of promotional discourse features varied between the linguistics and the literary RAs. Lindeberg (2004) also reported clear differences in the use of language of promotion and hedging strategies across three closely related disciplines of finance, marketing, and business management. Based on these findings, it is reasonable to hypothesize that individual disciplines within soft knowledge domain may also differ in the use of metadiscourse. However, a broad hard versus soft distinction may not help us to gain more fine-tuned picture of the use of metadiscourse within soft disciplines. Clearly, comparisons across individual soft disciplines are needed to tease out the more nuanced differences in the use of metadiscourse.

Another gap in the extant cross-disciplinary research on metadiscourse use is the

unbalanced representation of academic disciplines. Although several previous studies on discursive practices have involved a number of soft disciplines such as applied linguistics (e.g., Hyland 2000, 2005c), literary studies (e.g., Afros & Schryer, 2009; Lewin & Perpignan, 2012), business management (e.g., Harwood, 2005a, 2005b; Mur-Dueñas, 2007, 2010), economics (e.g., Bondi, 2010; Khedri et al., 2013), less attention has been paid to other disciplines in the social sciences. Given this neglect of knowledge, the present study extends the cross-disciplinary research by investigating the use of metadiscourse in three social science disciplines: applied linguistics, education, and psychology. These disciplines are chosen for two reasons. Firstly, except for applied linguistics, education and psychology have been underrepresented in previous cross-disciplinary research on metadiscourse. Thus, little knowledge is available regarding metadiscourse use of these two disciplines (but see Loi & Lim, 2013 for an exception). Second, all of the three disciplines are characterized by a diverse range of specialisms, research problems, and research paradigms (e.g., Alise & Teddlie, 2010; Kidd, 2002; Richards, 2009). All these factors, particularly the existence of multiple research paradigms, are likely to affect the use of metadiscourse in the disciplinary discourses. As shall be discussed in Chapter 3, research paradigm is another important focal variable in the present study apart from discipline.

While Hyland (1999, 2000, 2005c) has hinted that the hard-soft distinction in the use of metadiscourse could be attributed to the differences between the positivist and anti-positivist epistemologies dominating in the sciences and the humanities, no clear epistemological boundary can be drawn around the social sciences which tend to share characteristics with both the sciences and the humanities (Wignell, 2007). As noted above, all the three selected disciplines subsume a range of theoretical perspectives and

research paradigms, and a broad characterization of anti-positivist epistemology may not be adequate to account for the variation in metadiscourse within these disciplinary discourses. As shall be discussed in the next chapter, various research paradigms appear to compete for dominance across different fields of the social sciences. Although a few exploratory studies have given tangential attention to discursive practices between quantitative and qualitative research reports (e.g., Firestone, 1987; Hansen, 1988; Sallinen & Braidwood, 2009), little published research has ever investigated whether there exists any connections between different research paradigms in the social sciences and the use of metadiscourse in their discourses, such as RAs. Such glaring omission is surprising given that many social science disciplines can be characterized by multiple research paradigms, such as quantitative, qualitative and mixed methods research (e.g., Alise & Teddlie, 2010). Thus another goal of the present study is to bridge this gap by comparing the use of metadiscourse in quantitative, qualitative, and mixed methods RAs, as will be further elaborated in Chapter 3.

2.6 Summary

This chapter has reviewed both theoretical issues and empirical studies in relation to metadiscourse research and identified a few gaps in our knowledge about metadiscourse.

In the first three sections (2.1-2.3), I have reviewed some important theoretical issues related to the definition and delimitation of metadiscourse, which reveals the complex nature of the notion and the difficulty to delimit its boundary. Firstly, while metadiscourse is mainly concerned with the non-propositional aspect of language use, an influential view sees it as a special type of discourse operating on the interactive plane of discourse (Hyland, 2005b). Secondly, there are controversies over how to

delimit metadiscourse. The "narrow" approach advocates for focusing mainly on metatext, whereas the "broad" approach is in favor of including not only textual but also interpersonal metadiscourse. In addition, there are also those who claim to hold a middle position (e.g., Ädel, 2006) and who view all metadiscourse as interpersonal (e.g., Hyland, 2005b; Hyland & Tse, 2004). In this study I adopt the broad, interpersonal view of metadiscourse (Hyland, 2005b) that all metadiscourse represents interaction between writers and readers in discourse, and which is realized by interactive as well as interactional metadiscourse.

Secondly, in Section 2.4 I have reviewed the major lines of empirical research on the use of metadiscourse, with an emphasis on RAs. The cross-generic research on metadiscourse has revealed how metadiscourse differ across a range of genres produced in different communication contexts and aiming at different readership, such as RAs, textbooks, students' reports and science popularizations. Due to the complex interplay of the variables of national culture and disciplinary culture in academic writing research, this study has chosen to examine only the latter variable by excluding the former from consideration. Then, a review of cross-disciplinary comparison among different disciplines indicated important differences in the use of both interactive and interactional metadiscourse between the hard disciplines on one hand, and the soft disciplines on the other.

Based on a review of previous research, a few gaps in knowledge can be identified in Section 2.5. Firstly, there is a need for research on the use of metadiscourse within the social sciences; second, the disciplines of education and psychology have been underrepresented in previous work on metadiscourse; third, no available research has intensively investigated the use of metadiscourse in different research paradigms. This

neglect of research calls for further investigations which consider possible connections between metadiscourse use and different research paradigms across different social science disciplines. Thus, in the present study, I propose to further investigate the possible differences in the use of metadiscourse in quantitative, qualitative, and mixed methods RAs across the disciplines of applied linguistics, education, and psychology.

While the hard versus soft division is insufficient in describing the nuanced discursive differences between different social science disciplines and between different research paradigms, a new conceptual framework will be developed to facilitate such comparison in Chapter 3.

CAHPTER III

THEORETICAL FRAMEWORK

This chapter aims to construct a theoretical framework for the present study. The framework is composed of two important potential sources of influence on the use of metadiscourse in RAs, namely, discipline and research paradigm. The chapter will begin by drawing on theoretical notions about "knowledge structures" (Bernstein, 1999) and "knower structures" (Maton, 2000, also see Maton 2007, 2010a, 2010b, 2014) to frame the analysis across disciplines. By proposing a continuum of knowledge-knower structures for various academic disciplines, I argue that the discursive practices of the three disciplines under examination could be analyzed in relation to their relative positions along such a continuum.

Next, the chapter will introduce the concept of "paradigm" in social science research and provide a brief overview of the paradigm talk prevailing in the social sciences, for example, the conversation about various paradigms in terms of either the underlying philosophical assumptions or the research practice (e.g., Guba, 1990; Lincoln & Guba, 1985; Teddlie & Tashakkori, 2009). The discussion will focus on research paradigms and propose to view quantitative, mixed methods, and qualitative research as forming a continuum of paradigms. Then, the chapter provides an overview of the prevalence of the three research paradigms across and within the selected disciplines, which indicates the disciplinary variations in the knowledge-making practices and the plurality of different research paradigms within each of the selected disciplines. Next, it will model the relationship between research paradigms, knowledge

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creation, and discursive practices. The key argument is that basic assumptions about the world and knowledge at the paradigm level will permeate through every aspect of knowledge creation and representation. Finally, the chapter reviews the relevant literature on paradigmatic differences in discursive practices to justify the argument and identify the research gap for the present study.

3.1 Knowledge-Knower Structures in Academic Disciplines

3.1.1 Hierarchical and horizontal knowledge structures

As noted in Chapter II, the division of academic disciplines into the hard and soft ones appears to be instantiated by the respective discursive practices of each broad knowledge domain (Becher & Trowler, 2001; Hyland, 2000). In terms of the nature and forms of knowledge, such a distinction is similar to the classification between what Basil Bernstein (1999, p.162) called "hierarchical knowledge structures" and "horizontal knowledge structures". According to Bernstein (1999), different forms of knowledge can be realized in two types of discourse: "horizontal discourse" and "vertical discourse" (p. 158). The horizontal discourse refers to everyday or common-sense knowledge which is featured as "local, segmentally organised, context specific and dependent" (Bernstein, 1999, p.159). In contrast, vertical discourse refers to either the knowledge of the natural sciences, which takes the form of "a coherent, explicit, and systematically principled structure, hierarchically organized," or the knowledge produced by the humanities and the social sciences, which takes the form of "a series of specialised languages with specialised modes of interrogation and specialised criteria for the production and circulation" (p.159). Thus, knowledge in the form of vertical discourse represents the academic knowledge produced by different academic disciplines. The two different forms of knowledge in vertical discourse have

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been respectively referred to by Bernstein (1999) as "hierarchical knowledge structures" and "horizontal knowledge structures" (p.162). As Bernstein points out, hierarchical knowledge structures are typical of the natural sciences, which aim to create "very general propositions and theories" and "integrate knowledge at lower levels" across "an expanding range of apparently different phenomena" (p.162). In contrast, horizontal knowledge structures are characteristic of the humanities and the social sciences, where knowledge is produced by "sepcialised modes of interrogation" and represented by "specialised languages" (p.162).

Since knowledge in the natural sciences and the humanities takes different forms and is organized differently, these two types of knowledge structures give rise to distinct ways of knowledge accumulation or growth. Within hierarchical knowledge structures, knowledge growth takes the form of theory development, which means that a more general, inclusive theory will integrate a previous theory which may be more particularistic (Bernstein, 1999). However, a greater degree of generality in theory is not the case of knowledge development in horizontal knowledge structures. This is because different horizontal knowledge structures have their own specialized languages which "are not translatable" since these languages "make different and often opposing assumptions, with each language having its own criteria for legitimate texts, what counts as evidence, and what counts as legitimate questions, or a legitimate problematic" (Bernstein, 1999, p.163). Thus, horizontal knowledge structures, as opposed to hierarchical knowledge structures, accumulate knowledge by introducing new languages (Bernstein, 1999). A new language, in Bernstein's (1999) words, "offers the possibility of a fresh perspective, a new set of questions, a new set of connections, and an apparently new problematic, and most importantly, a new set of speakers" (p.163).

This means that in horizontal knowledge structures, a new knowledge is often brought about segmentally by a new generation of "speakers" who may use their new language to challenge "the hegemony and legitimacy of more senior speakers" (Bernstein, 1999, p.163). While Bernstein's (1999) model focuses on the epistemic principles and structures for organizing knowledge in different disciplinary fields, Maton (2000, 2007, 2010a, 2010b, 2014) has extended this model of knowledge structures into a model of knowledge-knower structures by adding knower structures as a social dimension.

3.1.2 Knowledge-knower structures and languages of legitimation

Bernstein's (1999) model of knowledge structures provides a way of analyzing the differences in the discourses of various intellectual fields or disciplines. According to Maton (2000, 2007, 2010a, 2014), however, a mere description of knowledge structures is insufficient to understand the underlying principles of discourses from different disciplinary fields. In addition to an epistemic dimension, there is also a social dimension of knowledge organization. As Maton argues, "social power and knowledge are intertwined, but irreducible to one another; knowledge comprises both sociological and epistemological forms of power" (2000, p.149). Thus, Maton (2007) proposes to expand Bernstein's knowledge structures by adding a social dimension of "knower structures" (p.91). Without knower structures, Maton (2010b) argues, "Bernstein's model can be criticized as overtly focused on progress in the sciences and offering a deficit model of the humanities" (p.178).

As in the knowledge structures, Maton (2007, see also Maton, 2010a, 2010b, 2014) distinguishes between "hierarchical knower structures" and "horizontal knower structures" (p.91). In other words, knower structures are distinguished "by the degree to which they integrate and subsume new knowers" (Maton, 2010b, p.164). Hierarchical

knower structures refer to "a systematically principled and hierarchical organization of knowers based on the image of an ideal knower which develops through the integration of new knowers at lower levels and across an expanding range of different dispositions" (Maton, 2007, p.91). This type of knower structures, as Maton (2007) suggests, characterizes the fields of humanities and can be portrayed as a "pyramid of knowers" (p.91) where the ideal knower occupies the pinnacle position (see Figure 3.1).By contrast, horizontal knower structures comprise of "a series of strongly bounded knowers, each with its own specialised modes of being and acting, with non-comparable habituses or embodied dispositions based on different biological and /or social backgrounds and histories" (Maton, 2007, p.92). Horizontal knower structures are characteristic of the natural sciences where individual scientists can be seen as a group of knowers segmented from each other in terms of their "different biological and/or social backgrounds and histories (Maton, 2007, p.92).

For Maton (2007), each intellectual field can be characterized by both a knowledge structure and a knower structure, because "for every knowledge structure there is also a knower structure" (p. 87). Thus, different intellectual fields or disciplines are characterized by different knowledge-knower structures. Overall, scientific fields can be portrayed as a combination of hierarchical knowledge structures and horizontal knower structures, whereas the fields of humanities can be characterized as a composite of the horizontal knowledge structures and the hierarchical knower structures. These patterns of knowledge-knower structures underlying the discourses of the sciences and the humanities are presented in Figure 3.1.
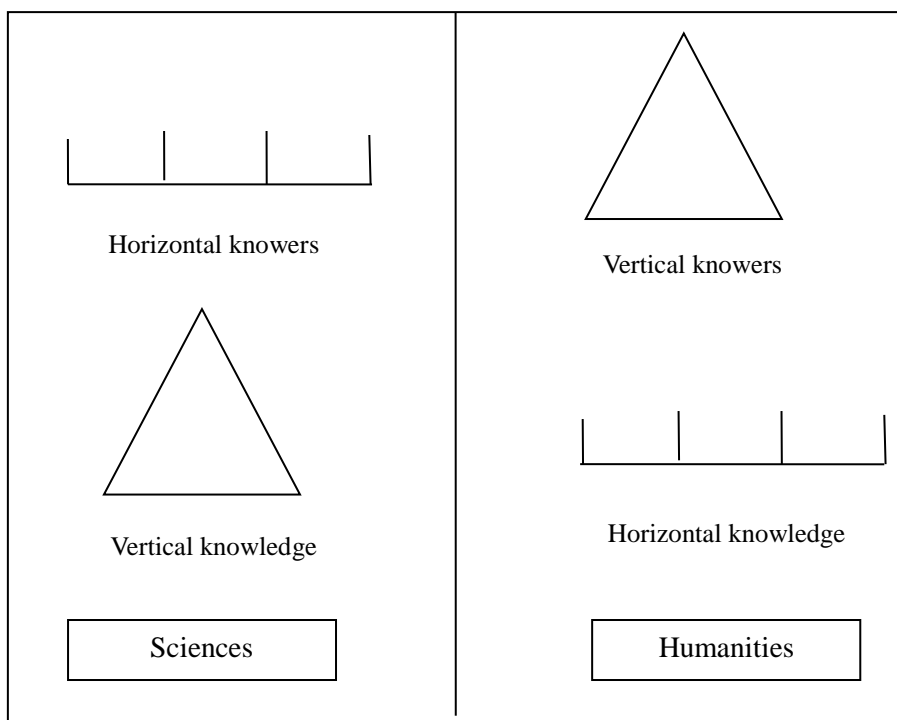
Figure 3.1 An illustration of different knowledge-knower structures in the sciences and the humanities

By making a distinction between knowledge and knower structures, Maton (2010a) proposes that knowledge claims and discursive practices made by actors from different disciplines constitute their disciplines' "languages of legitimation" (p.37) which can be analyzed in terms of two kinds of relations. The "epistemic relation" refers to the relationship "between knowledge and its proclaimed object (that part of the world of which knowledge is claimed or towards which practices are oriented)" (Maton, 2010a, p.43). The "social relation" refers to the relationship "between knowledge and its subject, author or actor (who is making the claim to knowledge or action)" (Maton, 2010a, p.44). In short, the languages of legitimation concern *what* can be claimed as legitimate knowledge of a certain disciplinary field and *who* has the legitimacy to make such knowledge claims. Since the relative strength of both the epistemic and the social

relations can vary from weak(-) to strong (+), Maton (2010a) distinguishes four different "legitimation codes"(p.43) to describe the principles underlying the knowledge claims and practices of different disciplinary fields (Figure 3.2)
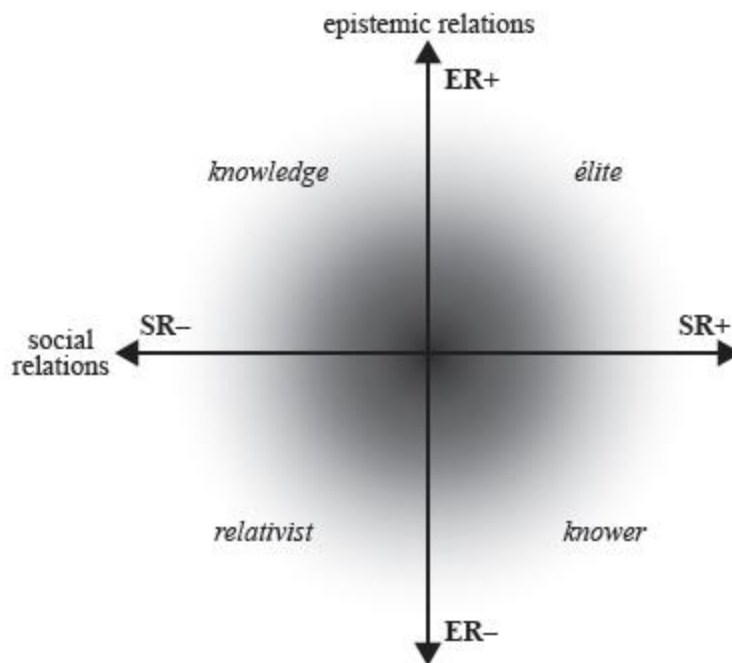
Figure 3.2 Different Legitimation Codes (adapted from Figure 5.1 in Maton, 2014, p.30)

Two most important legitimation codes presented in Figure 3.2 are the "knowledge code" and the "knower code" (p.44), whereas the "elite code" and the "relativist code" (p.45) are yet to be identified in practice (Maton, 2010a). The knowledge code refers to a language of legitimation with a stronger epistemic relation but a weaker social relation; in contrast, the knower code refers to a language of legitimation with a weaker epistemic relation but a stronger social relation. The key difference between the two codes of legitimation, as Maton (2010a) suggests, is "which of the two relations specializes legitimacy within the field, that is, which is emphasized when actors claim a special status for the knowledge and practices of the field and thereby define its

boundaries and limits" (p.47). In the knowledge code, claims are legitimated by the "special procedures" followed in an inquiry, but knowledge claims in the knower code are legitimated by the "privileged insights of the author" (Maton, 2010a, p.47). Elsewhere, Maton (2010b) elaborates the relationship between the two types of codes:

> For knowledge-code fields the principal motivation is developing knowledge, and training specialized knowers is a means to this end. For knower-code fields the principal motivation is developing knowers, and creating specialist knowledge is the means." Thus, adding 'knower structures' to the framework builds on rather than displaces 'knowledge structures'. (p. 164)

In summary, the knowledge code legitimates claims in disciplines according to agreed-upon specialized procedures, such as in the natural sciences, whereas the dispositions of knowers, such as their personal attributes, biological and social backgrounds are less significant; on the other hand, the knower code legitimates knowledge claims by knowers who possess special dispositions, rather than through specialised procedures, as is typical of the arts and humanities (Maton, 2007, 2010a, 2010b, 2014).

3.1.3 The legitimation code of the social sciences

Given that the sciences and the humanities adopt different codes of legitimation, a natural question to ask is: what is the code of legitimation for the social sciences? After an examination of discourses of economics, sociology, and political science, Wignell (2007) suggests that the language of social sciences has evolved "as a hybrid of the languages of the humanities and of the physical sciences, with, over time, the language patterns of the physical sciences taking a more and more prominent role" (p. 185). Thus, Wignell suggests that, firstly, the codes of legitimation in the social sciences may bear traces of both the knowledge code and the knower code, showing variations across

individual disciplinary fields; and secondly, there has been a tendency that the discourses of the social sciences are likely to be more oriented towards the knowledge code rather than the knower code over time, at least in the three disciplines under his examination. Whereas knowledge legitimation in the natural sciences and the humanities can be portrayed by contrasting the knowledge code and the knower code (Maton, 2007, 2010a, 2010b, 2014), what kind of legitimation code exists in the social sciences? One way to approach the question is to conceptualize the knowledge and the knower code as representing the two ends of a continuum and the social sciences take the middle range of the continuum in terms of the relative strengths of the respective epistemic and social relations (see Figure 3.3).
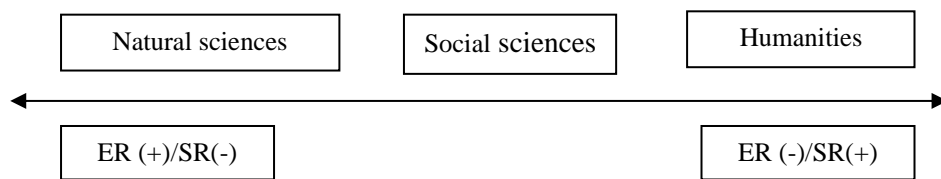
Figure 3.3 The relative positions of the natural sciences, social sciences, and humanities in epistemic and social relations

Nevertheless, social science is no more than a cover term for a diverse range of intellectual fields, and how knowledge is legitimated may vary from one discipline to another, which is also related to the nature of each disciplinary field. The disciplinary communities in the social sciences, as suggested in Becher and Trowler (2001), are relatively divergent and have more permeable boundaries as compared with those of the natural sciences. Most of social science disciplines embrace a wide range of specialisms or sub-disciplines where they are only loosely knit together but differ in the objects of study or modes of inquiry. Therefore, these disciplines have less stable, more

fragmented, and open-ended epistemological structures. For instance, the three disciplines under investigation in this study, namely, applied linguistics, education, and psychology, are likely to subsume a range of sub-disciplines where there might be both convergence and tensions. As will be detailed in Section 4.2.1.1 later, this study focuses only on certain specialisms or sub-disciplines rather than on the disciplines as a whole. However, for the sake of convenience, the thesis will still use the general labels such as applied linguistics, education, and psychology to differentiate each discipline.

For the purpose of this study, I propose that the three disciplines under investigation, that is, applied linguistics, education, and psychology, may be positioned in relation to each other and display different orientations towards either the knowledge code or knower code in terms of their relative strengths of the epistemic and social relations. In other words, they may vary in epistemic relations in terms of what constitute legitimate knowledge claims in the field, and in social relations in terms of who can make such knowledge claims. On the basis of previous research, it is plausible to hypothesize that the language of legitimation in psychology may be closer to the linguistic characteristics of the knowledge code, that is, those of the natural sciences. For instance, both the discourse and the research paradigms in psychology have been found to bear more traces of the natural sciences (Bazerman, 1988; Harper, 2008; Kidd, 2002; Madigan et al., 1995). On the other hand, the languages of legitimation in applied linguistics and education seem to lean toward the knower code, that is, those of the humanities. Although this tendency was indicated in some previous research on discursive practices in applied linguistics and education (e.g., Hood, 2010, 2011; Rabab'ah, 2013), such a hypothesis will be further evaluated in this study.

3.2 Paradigmatic Influences on Discursive Practice

3.2.1 The definition of paradigm in the social sciences

Over the past three decades, there has been considerable discussion about various paradigms in the social science research. The discussion has arisen mainly due to the emergence of what Lincoln and Guba (1985, p.14) called "naturalistic paradigm", as opposed to the traditional research paradigm of positivism which had been dominating in social science research. The conversation about paradigm becomes increasingly popular among social scientists partly because it has offered a principled way to connect a set of fundamental ontological and epistemological beliefs in the knowledge-making practices as well as the knowledge created thereof. This section will present an overview of the major philosophical and research paradigms prevailing in the social sciences.

A central question in social science research is how knowledge is created or produced. This begs another set of related questions: what counts as knowledge in the social sciences? What is the nature of this knowledge? How is this knowledge related to the researcher? How does this knowledge accumulate or grow? To answer these questions, it is necessary to know in which paradigm these questions are raised. Paradigms provide general frameworks within which such questions become meaningful and interesting.

What then is a paradigm? The concept is believed to be first put forward by Thomas Kuhn in his seminal work, *The Structure of Scientific Revolutions* (1962). Although Kuhn's use of *paradigm* was initially concerned with the natural sciences, this term has later been widely used by social scientists for various purposes (Morgan, 2007). Because Kuhn was criticized for having used *paradigm* in a variety of ways and caused

much confusion (Masterman, 1970), in a later edition of the book (1970), he attempted to clarify his use of paradigm by offering two definitions of this term in the postscript. On one hand, a paradigm "stands for the entire constellation of beliefs, values, techniques and so on shared by the members of a given community"; on the other hand, it refers to "the concrete puzzle solutions, which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science" (Kuhn, 1970, p.175). Although Kuhn himself seemed to favor the second definition, that is, paradigms as models or examples, it is the first definition, namely, paradigms as shared beliefs and assumptions that have been of most interest to social scientists (Morgan, 2007). For example, Guba (1990) defined paradigm in its most generic sense as "a basic set of beliefs that guides action" (p.17). More recently, Morgan (2007) has distinguished four interpretations of paradigm in the literature of social science research methodology. These four interpretations, as Morgan (2007) suggested, can be positioned on a continuum from the general to the specific: (1) paradigm as worldviews; (2) paradigm as epistemological stances; (3) paradigm as shared beliefs in a research field; (4) paradigm as model examples. All these interpretations "treat paradigms as shared belief systems that influence the kinds of knowledge researchers seek and how they interpret the evidence they collect" (Morgan, 2007, p. 50). In this study, following Guba (1990) and Morgan (2007), I define a paradigm generally as a set of shared assumptions and beliefs about the world, knowledge, and methodology that guide disciplined inquiries in a field. This definition shares similarity with what Morgan (2007) has termed "paradigm as epistemological stances" (p. 57) because it is mostly concerned with ontology, epistemology, and methodology in scientific pursuits.

The ontological and epistemological assumptions are fundamental to social science

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research and researchers because such assumptions form the philosophical roots of methodology in any inquiries. In brief, ontology refers to the theories, beliefs and assumptions about the nature of existence or reality. In other words, ontology addresses the question of what can be known (Guba, 1990). Answers to ontological questions constitute premises or foundations of social science inquiries.

While ontology deals with the nature of the world, epistemology is concerned with the question of how the world can be known. That is, it justifies what counts as scientific production of knowledge (Guba, 1990; Pascale, 2011). Epistemology also addresses the relationship between the knower and the known (Guba, 1990; Lincoln & Guba, 1985). Researchers' ontological and epistemological assumptions underlie their disciplined inquiries, regardless of whether or not they have an explicit knowledge of these terms. For example, how one conceptualizes the best approach to understanding the social world is clearly dependent on one's beliefs about the nature of such existence. Questions such as what constitutes data or what counts as evidence are all ontological and epistemological issues.

Another important component of a paradigm in this study is methodology. It is concerned with the question of how researchers should conduct research to generate knowledge. In this regard, it is important to make a distinction between methodology and method, as suggested by some theorists (e.g., Cohen et al., 2011; Guba & Lincoln, 1989; Smith, 1989). Simply put, methodology is more comprehensive, referring to an overall approach of inquiry, but method consists of more specific procedures such as data collection, data analysis, and sometimes even interpretation (Cohen et al., 2011). This distinction between methodology and method is parallel to Smith's (1989) "broad" and "narrow" senses of the term *method*, that is, "method as logic of justification" and

"method as technique" (p.4). Whereas method as logic of justification focuses on the justification provided in support of research practice, method as technique emphasizes on the steps or procedures involved in an inquiry. According to Smith (1989), it is the broad meaning of method that is more interesting because the logic of justification is closely related to the larger issues of epistemology and ontology. In short, the relationship between methodology and method can be summarized as follows: "The methodological question cannot be reduced to a question of methods; methods must be fitted to a predetermined methodology" (Guba & Lincoln, 2004, p.22).

In summary, a paradigm consists of a set of beliefs and assumptions about ontology, epistemology, and methodology in scientific research. The importance of paradigm has been well recognized because it plays a critical role in guiding researchers in their selection of research methods and strategies for data collection and analysis (Cohen et al., 2011; Guba, 1990; Guba &Lincoln, 1985).

3.2.2 Philosophical and research paradigms in the social sciences

3.2.2.1 Philosophical paradigms

In the social sciences, multiple ontological and epistemological stances coexist although dominant paradigms tend to vary from discipline to discipline. This section provides an overview of major paradigms prevailing in social science inquiries and examines their underlying assumptions and stances.

As mentioned earlier in Section 3.2.1, over the past 30 years, a range of paradigms emerging from different disciplines and research traditions have been competing for dominance in social science inquiries. Similarly, many theorists have proposed various ways to classify these diverse paradigms. Two broad approaches to classification appear to be widely used: paradigms can be distinguished either on the basis of their

philosophical underpinnings (e.g., Cohen et al., 2011; Creswell & Plano Clark, 2011; Guba, 1990; Guba & Lincoln, 1994, 2005; Lincoln & Guba, 1985; Ponterotto, 2005; Willis, 2007) or on the basis of their *research practice* (e.g., Creswell, 2009; Johnson & Christensen, 2012; Morgan, 2014; Teddlie & Tashakkori, 2009). In the first type of typology, paradigms are classified with an emphasis on the philosophy of knowledge and theoretical underpinnings, such as positivism or constructivism which has been underpinned by contrasting ontological and epistemological assumptions (see Table 3.1).

Table 3.1

Major Philosophical Paradigms in Social Science Inquiries

Guba & Lincoln (1994, 2005)	Ponterotto (2005)	Willis (2007)	Creswell & Plano Clark (2011)	Cohen, Manion, & Morrison (2011)
Positivism	Positivism	Positivism	Postpositivism	Positivism
Postpositivism	Postpositivism	Interpretivism	Constructivism	Interpretivism
Constructivism	Constructivism-Interpretivism	Critical theory	Participatory	Critical theory
			Pragmatism	
Critical theory et al.	Critical-Ideological			

Alternatively, from the perspective of research practice, various paradigms can also be classified according to the dominating methodological approach, such as quantitative, qualitative, and mixed methods research (see Table 3.2). Although philosophical paradigms and research paradigms cannot be simply mapped onto each other, they in fact converge to a great extent in terms of epistemological and methodological assumptions, as will be further discussed below.

Table 3.2

Major Research Paradigms in Social Science Inquires

Creswell (2009)	Teddlie & Tashakkori (2009)	Johnson & Christensen (2012)	Morgan (2014)
Quantitative research	Quantitative research	Quantitative research	Quantitative research
Qualitative research	Qualitative research	Qualitative research	Qualitative research
Mixed methods research	Mixed methods research	Mixed research	Mixed methods research

As can be seen from Table 3.1, the most common philosophical paradigms are positivism, postpositivism, constructivism/interpretivism, and critical theory. Among many scholars who have contributed to the on-going conversation about philosophical paradigms, Lincoln and Guba (1985, see also Guba, 1990; Guba & Lincoln 1994, 2004, 2005) have systematically mapped out different positions, contrasted in particular the conventional and the constructivist paradigms, and pointed out their incommensurability. The conventional paradigm refers to philosophical positivism which has dominated scientific inquiry for past several hundred years and is conventionally called the scientific paradigm. More recently, positivism has been under serious challenge, and a modified version of positivism, known as postpositivism, has been proposed to address some of those challenges. Although there are important differences between positivism and postpositivism, these two paradigms still share considerable common ground in some axiomatic elements and thus are "clearly commensurable" (Guba & Lincoln, 2005, p.201). Both positivism and postpositivism subscribe to a realist ontology, assuming the existence of objective reality. However, positivists' version of realism is naïve realism because they not only believe that there is an external reality, but that reality can be directly perceived through observation and can converge with theory through

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disciplined inquiry (Lincoln & Guba, 1985; Phillips & Burbules, 2000). Postpositivists, on the other hand, believe that reality can only be partially comprehended and that such understanding is simply probabilistic, hence the need for researchers to be critical about their inquiries (Phillips & Burbules, 2000; Popper, 1965). Generally, epistemological beliefs flow from ontological ones. Because of its ontological belief in the existence of an exterior reality, positivism assumes that it is possible to maintain a separation between the investigator and the investigated (i.e., the knower and the known), and that the investigator can objectively study the phenomenon without being influenced by it. This objectivist epistemological stance is often known as dualism (Smith, 1989), which stresses the separation between the knower and the known. Thus, the ideal inquiry process is construed as neutral and free from any possible value bias. Postpostivism, recognizing that absolute objectivity is impossible to achieve, modifies its position on dualism by retaining objectivity as a "regulatory ideal" and striving to be as neutral as possible (Guba, 1990, p.21). In addition, postpositivism relies on external sources such as "critical traditions" (requiring findings of any inquiry to be consistent with the existing scholarly tradition of the field) and the "critical community" (e.g., editors, referees, and professional peers) to achieve the goal of objectivity (Guba & Lincoln, 2004). Both ontological and epistemological assumptions feed into methodological beliefs. Likewise, methodology issue is based on the premises of ontology and epistemology. Given its realist ontology and an objectivist epistemology, it is understandable that the conventional paradigm favors an experimental, manipulative methodology. In this methodology, research questions or hypotheses are clearly formulated as propositions and are subjected to empirical tests for verification or falsification. Inquiries are conducted in such a way that possible confounding variables

are manipulated to prevent outcomes from being contaminated by contextual influences. Although the conventional paradigm mainly uses quantitative methods, it does not exclude qualitative methods from inquiry due to a postpositivist emphasis on triangulation (Guba & Lincoln, 1989, 2004). Apart from its methods of inquiry, the way a research is represented or crafted within the positivist/postpositivist paradigm is also perceived to be consistent with its ontological and epistemological assumptions (e.g., Cunliffe, 2011; Mantzoukas, 2004). For instance, in terms of what or who gets represented, (post)positivistic research typically foregrounds "the truth, the reality, and the laws of nature and society in an objective, value-free, and precise manner" but tends to minimize "any possibility of representing individuals, be they participants and /or researcher (s)" (Mantzoukas, 2004, p.997). In terms of language use, this type of research account is seen as "monologic" namely, 'written in the third person", and "in language that is abstract/academic" (Cunliffe, 2011, p.660). In short, the style and language of such research accounts and texts seem to be reflective of the realist ontology and the objectivist epistemology.

Because of an anti-positivist position, the constructivist paradigm (also referred to as the naturalistic or interpretivist paradigm) has been marginalized for a long time though it had an established tradition (Lincoln & Guba, 1985). In contrast to positivism, the constructivist paradigm subscribes to a relativist ontology, assuming that there exist multiple realities constructed socially by individuals. Unlike positivism or postpositivism, constructivism denies the existence of any universal or causal laws which might govern those constructed realities. Due to these very different ontological assumptions, it is not surprising that its epistemological beliefs also diverge from those of (post)positivism. Constructivism, contrary to (post)positivism, adopts a transactional

and subjectivist epistemology, assuming that it is impossible to separate the investigator from the object of the investigation and that it is the interaction between the two which creates the data and findings (Lincoln & Guba, 1985). Thus, this philosophical paradigm not only blurred the conventional distinction between ontology and epistemology but also allows value to enter the inquiry process and play an influential role in it. Because the constructivist paradigm assumes the existence of multiple social realities and adopts a transactional epistemology, it aims first and foremost to understand the variety of constructions by analyzing them, soliciting critiques from others, and bringing these critiques into a prevailing consensus (Guba, 1990; Guba & Lincoln, 1989). This methodology of inquiry is thus both hermeneutical and dialectical. To be more concrete, those various constructions are to be depicted and interpreted by conventional hermeneutical techniques, and are compared and contrasted through a dialectical interchange with research participants. With respect to representation, what or who is represented in research within the constructivist paradigm is perceived to be very different from the (post)positivistic perspective (Mantzoukas, 2004). Given a relativist ontology and a subjectivist epistemology, the research accounts within the constructivist paradigm are perceived to provide "thick interpretations and descriptions associated with the subjectivist focus on contextual and constructed meanings and subjectively experienced time and place" (Cunliffe, 2011, p.663). Thus, it is believed that researchers adhering to the anti-positivist paradigms have "a responsibility not only to include themselves in the text but also to identify adequately to the reader how they have done that" (Mantzoukas, 2004, p. 1002). The presence and voice of a researcher in this type of research becomes a necessity because such a way of representation can "help readers understand and evaluate the value of the research" by clearly stating all

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decisions made by the researchers and "how they relate to the fundamental epistemological and ontological propositions" of the non-positivist paradigms (p. 1003).

The paradigms of (post)positivism and constructivism, as argued by Guba and Lincoln (1994, 2005), have been contending for dominance and a paradigm shift in Kuhnian sense is going on with the constructivist paradigm gaining increasing prominence. I would argue that whether such a paradigm shift will run its full course depends on the individual field in question. For the present purpose, it is essential to realize that these paradigms are based on fundamentally different ontological, epistemological, and methodological assumptions.

With respect to the paradigm of critical theory, Guba (1990) believes it should be more appropriately labeled as "ideologically oriented inquiry" (p.23). Similarly, Ponterotto (2005) characterizes critical theory as "one of emancipation and transformation" which "serves to disrupt and change the status quo" (p.129). Critical theory has been used as a cover term for a range of alternative ideological perspectives, such as Marxism, feminism, and participatory research (Guba, 1990). In terms of ontology and epistemology, critical theory shares with constructivism in rejection of the idea that reality is directly knowable and its view of reality as constructed. However, it differs from constructivism in perceiving reality and events within power relations and in contending that all research is informed by ideological influences (Bogdan & Biklen, 2007; Ponterotto, 2005). In terms of methodology, critical theory advocates a dialectic stance in researcher-participant interaction which empowers participants towards emancipation and transformation (Guba, 1990; Ponterotto, 2005). In short, the critical paradigm is "primarily idiographic and emic" and "often forms the conceptual base for qualitative multicultural research" (Ponterotto, 2005, p.130).

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To sum up, a brief survey of the philosophical paradigms in social science inquires indicates the co-existence of several paradigms differentiated by distinct ontological, epistemological, and methodological assumptions. A broad contrast can be drawn between positivism and postpositivism on the one hand versus constructivism and critical theory on the other. As Willis (2007) suggests, although there are important differences within clusters of paradigms, for example, between positivism and postpositivism, or between constructivism and critical theory, such differences seem less important than similarities. Willis (2007) characterizes the relationship among within-group paradigms as that of "family resemblances" (p.12). In other words, although unique in their own ways, the individual paradigms within a broad group may share enough resemblances in philosophical roots. For example, positivism and its variant, postpositivism, resemble each other considerably and dominate the quantitative research tradition, whereas constructivism and critical theory constitute two most important paradigms in the qualitative research tradition (Bogdan & Biklen, 2007; Willis, 2007). Thus, some philosophers of the social sciences have classified paradigms of inquiry in terms of research practice, that is, methodological orientations to research, rather than the metaphysics or philosophy of knowledge.

3.2.2.2 Research paradigms

While philosophical paradigms emphasize the philosophical foundations of different approaches to inquiry, research paradigms focus more on methodological approaches to inquiry. Teddlie and Tashakkori (2009) argue that scientists in social and behavioral sciences can be generally grouped into three communities: purely quantitative researchers, purely qualitative researchers, and mixed methodologists. Within each of these communities, members share similar attributes, such as

philosophical beliefs, methodological orientations, and research practices. Between these communities, there tend to be some distinct "cultural" differences in worldviews, assumptions of knowledge-making, community goals, professional organizations, and enculturation of novices (Teddlie & Tashakkori, 2009, p.4). A brief summary of some main characteristics of the three communities is presented in Table 3.3.

In what follows, I compare and contrast the three research paradigms at the levels of paradigmatic assumptions, strategies of inquiry, and research methods. In particular, I highlight the differences between quantitative and qualitative research since these two paradigms are distinct both at the level of philosophical foundations and at the level of research practice.

Table 3.3

Characteristics of Quantitative, Qualitative, and Mixed Methods Research

Dimension	Quantitative	Mixed methods	Qualitative
Philosophical position	positivism/ postpositivism	pragmatism	constructivism/ interpretivism
Ontology (theory of reality)	objective, singular reality	objective and subjective; singular and multiple realities	subjective, mentally constructed, multiple realities
Epistemology (theory of knowledge)	justification of hypothesis; universal laws, and standards	pragmatic justification; mixture of universal laws and specific understanding	understanding of participants' aims and perspectives
Views of human behavior	regular and predictable	dynamic, complex, partially predictable	situational , intentional, and personal
Purpose of research	confirmatory; theory verification; causal explanation and prediction	confirmatory plus exploratory	exploratory; theory generation; empathetic understanding

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Methodology	deduction	deductive-inductive cycle; abduction	induction
Typical design(s)	(quasi) experimental; correlational; survey	mixed designs (e.g., parallel, sequential)	ethnographic designs; case study
Form of data	typically numeric	both numeric and narrative	typically narrative
Sampling	mostly probability	probability, purposive and mixed	mostly purposive
Data analysis	statistical analyses: descriptive and inferential	integration of thematic and statistical	thematic analyses: categorical and contextualizing
Results	generalizable knowledge; provision of objective outsider's views	both objective and subjective views	particularistic knowledge, provision of insiders' views
Validity/ Trustworthiness	internal and external validity	inference quality, inference transferability	trustworthiness; credibility; transferability
Researcher role	detached; objective	intersubjective	immersed; subjective
Rhetoric	impersonal, formal style	integration of formal and informal style	literary, informal style

Note: The table is adapted from Teddlie & Tashakkori (2009)

In terms of philosophical foundations, quantitative and qualitative research are often connected to different worldviews and philosophies of knowledge. Quantitative research is typically associated with positivism/ postpositivism which takes a realist view of the world and claims that all genuine knowledge is derived from empirical experience and can be advanced only by means of neutral observation and experimentation (Phillips & Burbules, 2000). Within this perspective, knowledge takes the form of universal standards or laws which are independent of researchers (Creswell, 2009; Johnson & Christensen, 2012; Teddlie & Tashakkori, 2009). In contrast,

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qualitative research is generally associated with constructivist/interpretivist philosophies which subscribe to a worldview of multiple, constructed realities (Creswell, 2009; Johnson & Christensen, 2012; Teddlie & Tashakkori, 2009) Qualitative researchers regard social science inquiries as subjective rather than objective undertakings and endeavor to understand social phenomena from the standpoint of individuals in specific contexts (Lincoln & Guba, 1985). As an alternative to both quantitative and qualitative research, mixed methods research typically associates itself with the philosophical orientation of pragmatism, advocating the use of whatever methodological tools required to address the research questions under study (Morgan, 2014; Johnson & Christensen, 2012; Johnson, Onwuegbuzie, & Turner, 2007; Teddlie & Tashakkori, 2009). Epistemologically, mixed methods researchers believe that knowledge is both shared social experience and unique to individuals (Morgan, 2014). Therefore, the knowledge produced within mixed methods usually exhibits the characteristics of both quantitative and qualitative paradigms, that is, a mixture of universal laws and concrete understandings of participant perspectives (Johnson & Christensen, 2012).

With respect to research practice, the quantitative and qualitative research paradigms are distinguished by their respective objectives, methodologies, strategies of inquiry, and specific procedures. The quantitative research paradigm typically views human behavior as governed by regularities and determined by causes. Therefore, the purpose of the quantitative paradigm is confirmatory, that is, to identify the causal mechanisms at work. Typically, quantitative research follows a hypothetico-deductive methodology where researchers generate hypotheses from a theory or a conceptual framework and test them by collecting numeric data and conducting statistical analyses (Cohen et al., 2011; Johnson & Christensen, 2012). Designs in quantitative research are

well established, for example, survey, (quasi) experimental, causal comparative and correlational studies (Crsewell, 2009). Data in quantitative research are typically numeric. Quantitative researchers give priority to internal and external validity to ensure strong causal inference and the generalizability of their findings. Within the quantitative research paradigm, social scientists emulate natural scientists in their endeavor to produce laws or law-like generalizations (Johnson & Christensen, 2012; Teddlie & Tashakkori, 2009).

In comparison, the qualitative research paradigm tends to view human behavior as "being fluid, dynamic, and changing over time and place" (Johnson & Christensen, 2012, p. 35). Thus, qualitative researchers advocate studying such behaviors in naturalistic settings and in a holistic way. They typically employ inductive methods to gather, analyze, interpret and present qualitative data and seek to interpret rather than generalize their findings (Lincoln & Guba, 1985; Johnson & Christensen, 2012).Typical designs in the qualitative tradition include ethnography and case study (Creswell, 2009). Unlike quantitative researchers, qualitative researchers are not interested in linear causal relationship between variables but seek an in-depth description and understanding of a particular phenomenon (Johnson & Christensen, 2012). Compared with quantitative research, subjectivity is inherent in the qualitative approach since the human researcher often acts as the principal instrument in the research process (Lincoln & Guba, 1985). Qualitative data typically take the form of narratives rather than precise measurements. To establish trustworthiness of research, qualitative researchers propose to use credibility and transferability to replace internal and external validity—two crucial criteria in quantitative research (Lincoln & Guba, 1985). The findings of qualitative research are particularistic, taking the forms of local descriptions and interpretation

from the insiders' perspectives rather than being expressed in law-like generalizations (Johnson & Christensen, 2012).

Given its orientation towards pragmatism, mixed methods research combines practices of both quantitative and qualitative research. The purpose of the mixed methods research paradigm is to gain multiple perspectives in understanding a phenomenon. To achieve such an objective, the mixed methods paradigm relies on a deductive-inductive cycle or abduction that moves back and forth between induction and deduction to construct knowledge (Morgan, 2007, 2014; Teddlie & Tashakkori, 2009). Typical designs of mixed methods research include parallel and sequential designs which either give equal attention to both quantitative and qualitative phases or prioritize one over the other (Creswell, 2009; Morgan, 2014; Teddlie & Tashakkori, 2009). Researchers from the mixed methods community are inclined to adopt an intersubjective stance which is situated between subjectivity and objectivity (Morgan, 2007). Data in mixed methods research comprises of both numeric information and narratives, and both quantitative and qualitative analyses are applied to the collected data. Finally, research results are based on an integration of multiple perspectives from both outsiders and insiders (Johnson & Christensen, 2012).

3.2.3 A continuum of research paradigms

In the previous section, I have contrasted some important features of the quantitative and qualitative research paradigms. For methodological purists, there are deep-seated differences in paradigmatic assumptions between quantitative and qualitative research. Those perceived differences have generated complex arguments and debates, which are often referred to as "paradigm wars" (Gage, 1989, p.4) between purists on the one hand and pragmatists on the other (Firestone, 1987).

The purists believe that quantitative and qualitative researches are incompatible due to their different underlying axiomatic assumptions (e.g., Lincoln & Guba, 1985; Smith & Heshusius, 1986). This constitutes one of the central controversies known as the "incompatibility thesis" (Teddlie &Tashakkori, 2009, p.15). However, the incompatibility thesis has been criticized by others who hold a pragmatic view (e.g., Firestone, 1990; Howe, 1988; Reichardt & Cook, 1979). Pragmatists argue that the incompatibility thesis is untenable because research methods are not necessarily determined by paradigms but should be selected in response to the demands of research (Howe, 1988; Reichardt & Cook, 1979). Although the "what works" (Howe, 1988, p.10) principle guiding the new paradigm has been criticized for lacking solid theoretical underpinnings, the recent rise of pragmatism and mixed methods research offer an alternative to the existing quantitative and qualitative paradigms (Johnson & Onwuegbuzie, 2004).

While it is useful to highlight the differences between the quantitative, qualitative, and mixed methods research paradigms, it is more productive and relevant to the present study to view these paradigms as constituting a continuum anchored in quantitative and qualitative research at the two extremes (Johnson & Christensen, 2012; Johnson, Onwuegbuzie, & Turner, 2007; Niglas, 2010; Teddlie & Tashakkori, 2009). This perspective is illustrated in Figure 3.4. The circle on the left represents the quantitative research paradigm with its roots embedded in the positivist /postpositivist philosophies. It includes research methodologies and methods which aim to be confirmatory, objective, and generalizable in nature. The circle on the right represents the qualitative research paradigm associated with the constructivist/interpretivist philosophies. Methodologies and methods utilized by this paradigm are exploratory, descriptive and

subjective in nature. The overlapping area between the two circles represents the mixed methods research paradigm with its roots in pragmatism. Methodologies and methods adopted in this paradigm comprise components from the other two paradigms. This conceptualization of different methodological approaches as spreading along a continuum reflects a dynamic view of research paradigms (Johnson et al., 2007; Teddlie & Tashakkori, 2009). For example, movement towards the middle of the continuum indicates a greater degree of integration of research methods, and movement away from the middle indicates that methods are less integrated and more distinct. Mixed methods research can move along the continuum in a flexible way in search of answers to particular research questions.
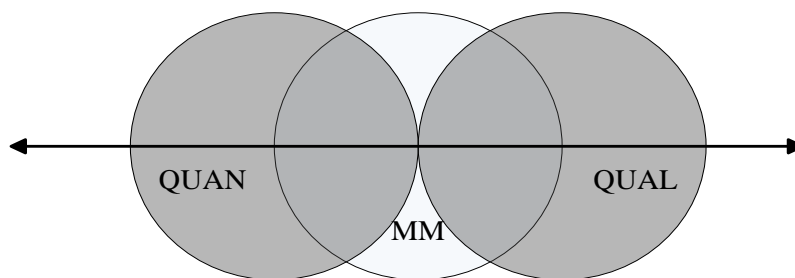
Figure 3.4 The continuum of quantitative, mixed methods, and qualitative research paradigms

In summary, the above discussion shows that the quantitative and qualitative research paradigms have radically different epistemological stances and that each paradigm makes use of a distinct range of research methods and techniques consistent with their respective paradigmatic assumptions. It is now increasingly common to view quantitative, qualitative and mixed methods research as three distinct but overlapping paradigms. These paradigms are separated by their unique "cultures" shaped by their philosophical foundations and preferred ways of reasoning, although those differences

do not prevent "cross-cultural" communication among researchers (Teddlie & Tashakkori, 2009). In other words, these research paradigms are driven by broad differences in ontological and epistemological assumptions, which in turn shape research practices in the creation and representation of knowledge.

Although the social sciences host an array of philosophical and research paradigms, the status of a particular paradigm may vary from discipline to discipline. This is because the social sciences are characterized by "a significant level of internal disagreement in both general ways of seeing the world and specific ways of tackling research issues" (Becher, 1989, p.10). Thus, there is much diversity across individual disciplines and even across different specialisms within a particular discipline. Each of those disciplines or specialisms may have their own epistemological cultures and methodological approaches. Therefore there are likely to be both inter- and intra-disciplinary similarities and differences in the research paradigms of those disciplines or specialisms. While it is impossible to provide a comprehensive overview of the different research paradigms and methodologies of the entire terrain of the social sciences, the present study focuses on inter- and intra-disciplinary comparisons of paradigms in the selected disciplines of applied linguistics, education, and psychology.

3.2.4 Research paradigms across and within the selected disciplines

3.2.4.1 Inter-disciplinary comparisons of research paradigms

Becher (1989) characterizes different disciplines as knowledge communities or academic tribes. These tribes, as Becher (1989) argues, can be differentiated by their distinct cultural elements, that is, their traditions, beliefs, practices, as well as their linguistic and symbolic forms of communication and shared meanings. Historically, grounded in (post)positivism, mainstream psychological research relies heavily on

quantitative research approaches. Applied linguistics and education, on the other hand, lean more towards constructivism and use qualitative approaches considerably. These general tendencies, however, do not exclude the possibility of the coexistence of multiple paradigms within a particular discipline but simply highlight significant inter-disciplinary differences in terms of research paradigms and methodologies.

It has been well recognized that the discipline of psychology is historically dominated by (post)positivist thinking and has a prevailing quantitative research paradigm (Ponterotto, 2005). Since its establishment, psychology has sought the application of the "scientific methods" to its problems (Shaughnessy, Zechmeister, & Zechmeister, 2012, p.4). The 'scientific method' is characterized by a reliance on empirical procedures, rather than intuition, and by an attempt to control, through experimental manipulation, those factors hypothesized to be responsible for a phenomenon (Shaughnessy et al., 2012). Although psychology includes elements from both the natural and human sciences, this discipline has typically been portrayed as a branch of the natural sciences, obscuring its social or human science heritage (Farr, 1996). Although the qualitative and mixed methods research paradigms have made regular appearance in certain subfields of psychology (e.g., counseling psychology), the quantitative research paradigm still predominates in mainstream psychology which aims at scientific theory construction and testing, emulating the natural sciences in both its paradigmatic development and research methodologies (Alise & Teddlie, 2010).

In comparison, although (post)positivist influences and quantitative research show a strong presence in the fields of education and applied linguistics, these two disciplines have been more inclusive towards alternative paradigms. Some commentators (e.g., Donmoyer, 2006) even suggest that the field of education has undergone a paradigm

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shift—a methodological revolution—during the 1970s and the 1980s. Prior to the 1970s, the field of education was dominated by positivism and most educational researchers tended to view knowledge as being discovered rather than being constructed (Phillips, 1983). In practice, the quantitative research paradigm was preferred by educational research and the experimental and quasi-experimental designs were highly influential (Smith, 1989). During the 1970s and the 1980s, the conventional paradigm was severely challenged by emergent paradigms such as constructivism, and intense debates over different paradigms and methodologies known as "paradigm wars" occupied in the discipline of education (Gage, 1989, p.4). By the mid-1980s, the qualitative research paradigm had gained considerable ground in education and evaluation research (Guba & Lincoln, 1989). According to Donmoyer (2006), now virtually all educational researchers are constructivists, and "at the epistemological level, the paradigms wars have been won by those who embraced naturalist/constructivist/interpretivist thinking" (p. 24). The pervasiveness of constructivism in educational research is partly due to the applied nature of the discipline. In Becher and Trowler's (2001, p.36) categorization, education falls into the "soft applied" knowledge domain because considerable educational research is intended to improve the learning and teaching practice and provide a basis for policy-making. Given such orientations, the 'value-free' and 'objective' quantitative paradigm and its underlying (post)positivism has gradually given way to the 'value-laden' and 'subjective' qualitative paradigm underpinned by constructivist/interpretivist philosophies. This has given rise to a "paradigm proliferation" (Donmoyer, 2006, p.11) in the discipline of education where researchers work from a range of research paradigms, including (post)positivism and constructivism and utilize both quantitative and qualitative research approaches.

Similar to education, the discipline of applied linguistics features a broad range of perspectives, rooted in both (post)positivist and constructivist traditions. In general, the quantitative research paradigm was dominant, particularly in the subfield of language learning and teaching research (Dörnyei, 2007; Henning, 1986; Lazaraton, 2000, 2005). The quantitative paradigm has its peak days in the 1970s and the 1980s, during which there was considerable growth of research output using quantitative methodologies and methods (Henning, 1986; Lazaraton, 2000). Since the mid-1990s, qualitative research began to make increasing presence within some mainstream applied linguistics journals with the widening of the scope of research in the field (Benson et al., 2009; Dörnyei, 2007; Gao, Li, & Lü, 2001).Within the field of applied linguistics today, the qualitative research paradigm has established itself in areas such as gender, race, identity (Dörnyei, 2007), though it has yet to achieve an equal footing as the quantitative research paradigm(Benson, et al., 2009). Moreover, recent years have also seen a steady growth of mixed methods research in both disciplines of education and applied linguistics (e.g., Alise & Teddlie, 2010; Hashemi & Babaii, 2013). This indicates a growing awareness among educational researchers and applied linguists that there is a need for greater methodological openness beyond the conventional research paradigm.

In summary, among the three disciplinary communities, psychology seems to be strongly oriented towards (post) positivism and quantitative research, resulting in a minority status for alternative paradigms and methods of inquiry. In comparison, although (post)positivistic and associated quantitative research are still influential in the fields of education and applied linguistics, the alternative paradigms such as qualitative and mixed methods research have been increasingly embraced by practitioners in both fields. These broad disciplinary differences in research paradigms are reflective of

differences in the ontological and epistemological bases of the disciplines under examination. However, each of the examined disciplines has subsumed a range of different paradigms and methodological approaches. A brief intra-disciplinary overview of paradigmatic development can reveal how different research paradigms are positioned within each of the selected disciplines.

3.2.4.2 Intra-disciplinary comparisons of research paradigms

As noted above, in the social sciences there is typically a high level of internal disagreement about research paradigms and methods. A particular social science discipline normally hosts a wide range of theoretical perspectives and research methodologies. In the following section, a comparison of the three research paradigms within each of the selected disciplines is provided.

As previously mentioned, psychology is well known as a field which has been dominated by positivism and the quantitative research paradigm. Although a marked growth in qualitative research has been observed over the past few decades, the field of psychology is still dominated by quantitative research whereas qualitative research and mixed methods research are less prominent (Alise & Teddlie, 2010; Kidd, 2002; Rennie, Watson, & Monteiro, 2002). As an indicator, Rennie et al. (2002) conducted a content analysis of the psychological literature produced in the past century (up to 1999) to see if there had been a paradigm shift. Five search terms (*qualitative research*, *grounded theory*, *discourse analysis*, *phenomenological psychology*, and *empirical phenomenology*) were applied to the database of *PsycINFO* to trace the growth of these methods over the 20th century. Although the results showed a notable increase in qualitative research in the field of psychology, there was little evidence of any major shift regarding the prevalent research paradigm, namely, quantitative research.

Additionally, according to Rennie et al. (2002), the growth of qualitative publications seemed to be heavily skewed by the production of just a few journals which were specially devoted to qualitative research. A similar trend was also reported by Kidd (2002), who investigated the extent to which qualitative research was accepted by mainstream psychological journals. He examined 15 journals published by the American Psychological Association (APA) in the years of 1989, 1994, and 1999, and found very few qualitative research (approximately 1%) being published in the APA journals during the 10-year period. More recently, in a cross-disciplinary study on the prevalence rates of different types of research methodologies and paradigms, Alise and Teddlie (2010) reported that an overwhelming majority of the RAs in the most prestigious psychology journals were quantitative (93%), whereas only a minority of articles (7%) used mixed methods designs, and none was qualitative.

The above results suggest that despite the enthusiastic call for a "paradigm shift" (Ponterotto, 2005, p.126) or "tectonic change" (O'Neill, 2002, p.190) in the field, the gradual increase of qualitative research is not without resistance from mainstream psychology, which has been dominated by (post)positivism and quantitative research. Even among the published qualitative research papers, there seems to be a tendency to follow norms set for quantitative research, such as minimizing researcher subjectivity (Hoyt & Bhati, 2007).The resistance to qualitative research, according to Kidd (2002), is largely due to the borrowing and dominance of the epistemology and methodology of the natural sciences, combined with an insufficient knowledge of qualitative methodology. To sum up, an overview of research paradigms and methodologies within psychology shows that the discipline as a whole is dominated by quantitative research paradigm. Although alternative research paradigms, such as qualitative research, occupy

only marginalized positions, a growing number of psychologists have called for pluralism of research approaches, particularly qualitative and mixed methods research (Kelle, 2006; Madill & Gough, 2008; O'Neill, 2002; Ponterotto, 2005; Yoshikawa, Weisner, Kalil, & Way, 2008).

The field of education, as compared with psychology, appears to be more open towards alternative research paradigms and methodologies. As noted earlier, Alise and Teddlie (2010) examined methodological approaches in empirical RAs across four social/behavioral sciences. The results indicated that the prevalence rates were higher for qualitative and mixed methods studies in applied disciplines like education and nursing than in pure disciplines, such as psychology and sociology. Specifically, the rates for mixed methods and qualitative research in education were 24% and 34% respectively as compared with 7% and 0% in psychology. Since all the empirical RAs in the study were collected from the most prestigious journals in each field, such notable prevalence rates for alternative research paradigms (over 50% when mixed methods and qualitative studies were combined) can be seen as indicative of a more equal status for competing paradigms in educational research. These findings were corroborated by Hart et al. (2009), who reported a survey of research methods in 710 RAs published in prominent English-language journals in mathematics education from 1999 to 2005. It was found that the prevalence rates for quantitative, qualitative and mixed methods were 50%, 21%, and 29% respectively. Similar findings were reported by Ross and Onwuegbuzie (2010) who compared the prevalence rates of mixed methods articles published in two educational journals, namely, *Journal for Research in Mathematics Education* (*JRME*), and *American Educational Research Journal* (*AERJ*). Of the 398 RAs included in the study, the mixed methods studies constituted one third (33%) of all

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the RAs in *JRME* and 24% in *AERJ*.

The studies reviewed above indicated that multiple research paradigms exist within the field of education. Alternative paradigms such as qualitative and mixed methods research have been contending with quantitative research for dominance, leading to paradigmatic pluralism in the field.

Similarly to education, the territory of inquiry also appears to be opening up to alternative research paradigms in applied linguistics. This tendency has been observed by surveys of different types of RAs (Benson et al., 2009; Gao, Li, & Lü, 2001; Hashemi & Babaii, 2013; Lazaraton, 2000, 2005; Richards, 2009) as well as textbooks and manuals of research methods (Dörnyei, 2007; Richards, 2003). A review of the literature shows an increasing presence of qualitative and mixed methods research in language teaching and learning journals since the 1990s. Lazaraton (2000) examined 332 empirical papers in four journals in applied linguistics journals (*Language Learning*, *The Modern Language Journal*, *Studies in Second language Acquisition*, *TESOL Quarterly*) from 1991-1997, and found that only 10% of the articles were qualitative research. Later on, extending this survey to 2001, Lazaraton (2005) reported a slight increase of qualitative studies, up to 14% out of the 524 empirical articles sampled from the same four journals. Cross-journal analyses showed that *TESOL Quarterly* was a preferred outlet for qualitative research, accounted for 41% of the total empirical papers in this journal. Covering a much longer period from 1978 to 1997, Gao et al. (2001) compared research methods in applied linguistics journals in China and the West. The English-language journals (*TESOL Quarterly*, *The Modern Language Journal*, *Applied Linguistics*, and *International Review of Applied Linguistics*) included in their study overlapped in part with those examined by Lazaraton's (2000, 2005). Their analyses

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showed that the rates for quantitative and qualitative research articles were 39% and 18% respectively. They also noted that from the mid 1990s onwards, the percentage of qualitative studies was approaching that of quantitative studies in selected journals (e.g., *TESOL Quarterly)*.To follow up on the results of the earlier surveys, Benson et al. (2009) conducted a comprehensive survey of qualitative research in 10 journals in language teaching and learning from 1997 to 2006. Using a tripartite classifying scheme of non-empirical, quantitative, and qualitative research, they reported that 477 empirical articles examined were qualitative, accounting for 22% of a total of 2,202 articles. The proportion of qualitative RAs reported in their study was higher compared with the figures from Lazaraton's (2005) or Gao et al.'s (2001) study. This is probably because Benson et al. (2009) used a more inclusive definition of qualitative research, including those studies which employed a mixture of quantitative and qualitative methods. Benson et al. (2009) concluded that qualitative research has been playing an important role in language learning and teaching research.

This conclusion was somewhat supported by another comprehensive review of qualitative research conducted by Richards (2009) in the field of language teaching from 2000 to 2007. Six out of the 15 journals selected for Richards' (2009) study were also included in Benson et al.'s (2009) study. The results showed variability across the journals. While some highly specialized journals (e.g., *International Journal of Bilingual Education & Bilingualism*, *English for Specific Purposes*, *Journal of Second Language Writing*) published low proportions (i.e., less than 10%) of qualitative RAs, some general journals (e.g., *The Modern Language Journal*, *Applied Linguistics*, *TESOL Quarterly*) carried 20% or more of qualitative RAs. Notably, most journals examined in Richards' study showed consistency over the period in the extent to which

they published qualitative articles. No clear patterns of qualitative research or evidence of a trend towards any direction could be detected. With respect to mixed methods research, Hashemi and Babaii (2013) surveyed seven major international applied linguistics journals (e.g., *Applied Linguistics, The Modern Language Journal*, *Language Learning*, *TESOL Quarterly*) between 1995 and 2008. A total of 205 mixed methods RAs were published in the selected journals over a period of 14 years, although no information about the proportions of different research paradigms was reported.

Taken together, the above studies suggested that alternative research paradigms have been gaining momentum in the field of applied linguistics since the 1990s. Although the quantitative research paradigm is still predominant, the proportions of qualitative research published in academic journals have either remained consistent or showed a gradual increase. This is indicative of the competing influences of different research paradigms in applied linguistics.

In summary, two conclusions can be drawn from the inter- and intra-disciplinary comparisons. Firstly, different values have been placed on different research paradigms across the three disciplinary communities. Psychology has been dominated by quantitative research as a result of its borrowing of the positivistic paradigm from the natural sciences. In comparison, the alternative paradigms such as qualitative and mixed methods research had only a peripheral presence in the discipline of psychology. In the field of education and applied linguistics, although quantitative research has been an established paradigm, there is a strong presence of qualitative and mixed methods research, indicating the applied nature and the constructivist orientation of the disciplines. The values attached to different research paradigms in a particular discipline are indicative of the nature of the discipline and are thus part of the disciplinary culture.

Second, within each of the selected disciplines, multiple research paradigms coexist, although their relative strengths and influences vary to different extents. The plurality of research paradigms in these disciplines can provide a basis for conducting a cross-paradigmatic comparison in the present study.

3.2.5 Connection between knowledge creation and representation

As indicated in Section 3.2.2, the quantitative and qualitative research paradigms have entirely distinct research practices due to the contrasting ontological and epistemological assumptions. Some methodological theorists have proposed that research paradigms have a fundamental impact on knowledge generation and representation (e.g., Carter & Little, 2007; Guba & Lincoln, 1994, 2005; Lincoln, 1990). For example, Lincoln (1990) argues that "the adoption of a paradigm literally permeates every act even tangentially associated with inquiry, such that any consideration even remotely attached to inquiry processes demands rethinking to bring decisions into line with the worldview embodied in the paradigm itself" (p. 81). In a similar vein, Carter and Little (2007) propose that the epistemology of a research paradigm "modifies methodology and justifies the knowledge produced" (p. 1317). Given the all-pervasive influence of research paradigm, a connection has been suggested between a discipline's research paradigm and its discourse conventions, that is, knowledge representation (Lincoln, 1990; Popkewitz 1990). In particular, Lincoln (1990) points out that the discourse of anti-positivist paradigms differs from that of the positivist paradigm:

> Slowly but surely, it has dawned on me—as it has dawned on others— that the discourse of science supports and reinforces a way of looking at the world that is antithetical to naturalistic or constructivist inquiry. (p. 85)

Based on this and similar proposals, a model of how research paradigm may influence

and shape knowledge creation and representation in a particular discipline can be developed, as is presented in Figure 3.5.
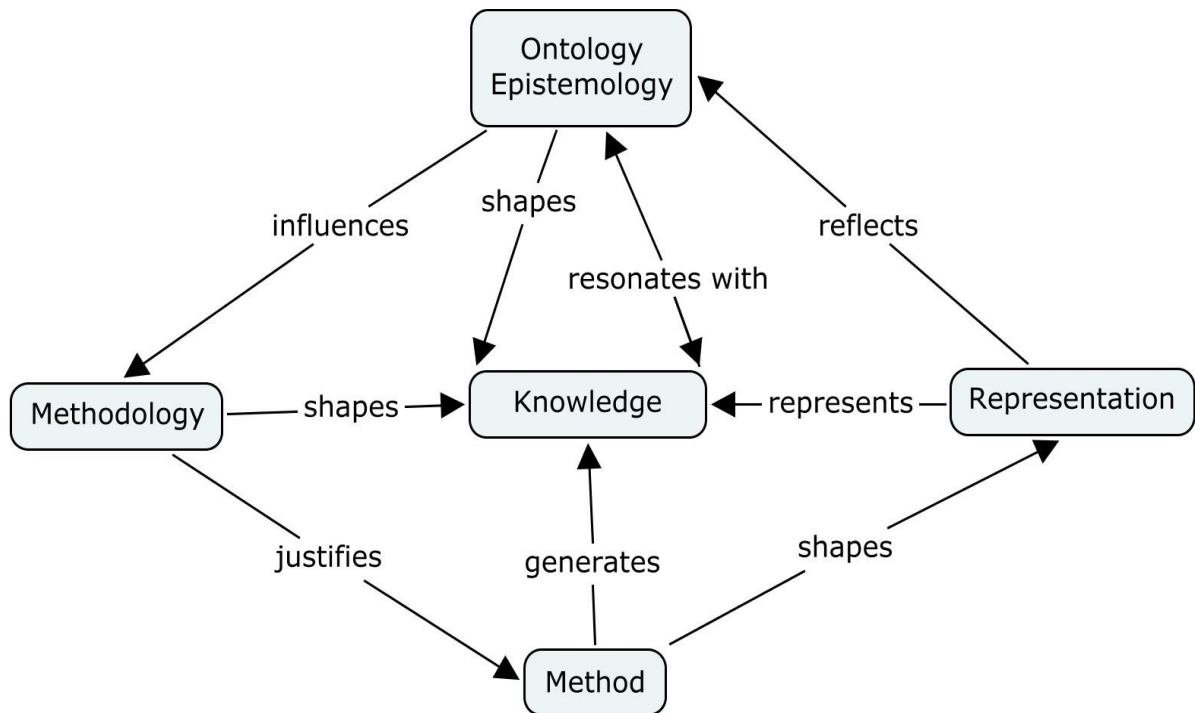
Figure 3.5 Paradigmatic influences on knowledge creation and representation

This model begins with ontological assumptions about the nature of reality, and epistemological assumptions about the nature of knowledge. These axiomatic assumptions influence methodological assumptions about the best approaches to generate knowledge. Such methodological assumptions justify the use of specific methods for data collection and data analysis. Any decisions at the lower level of practice are informed and influenced by assumptions at the higher level of philosophical foundations. Knowledge is shaped by the ontological and epistemological assumptions underlying the research paradigm and created from the application of specific methods to data collection and analysis. Aside from knowledge creation, the paradigmatic

assumptions also shape knowledge representation by means of discourse and rhetoric. On the other hand, knowledge generated and represented within a particular research paradigm also resonates with and reinforces the fundamental assumptions the paradigm subscribes to. For example, researchers such as Firestone (1987), Lincoln (1990), and Popkewitz (1990) have observed that the way knowledge is typically produced and represented within a particular research paradigm reflects and instantiates its assumptions of methodology and epistemology.

Being cognizant of differences between the positivist and the anti-positivist discourses, Lincoln (1990) has urged qualitative researchers to leave behind the positivist discursive practices, such as "subject-object dualism," "objectivity," and "the dispassionate tone," and adopt a language that reflects "connectedness," "interactivity," and "energy and passion" (p.86). Although Lincoln's proposal for developing an alternative discourse has been criticized as "evangelical rhetoric" (Berkenkotter, 1993, p.295), Berkenkotter (1993) also recognizes that "Lincoln does raise an important concern regarding the ways in which a discipline's textual conventions instantiate its methodological assumptions and by implication, its epistemology" (p.295). In a similar vein, Popkewitz (1990) argues that different intellectual traditions, while dominated by different research paradigms, construct arguments differently. For instance, writing in psychology requires a different type of evidence and reasoning from that of history or anthropology, and such differences in writing "portray different assumptions about knowledge and truth" (Popkewitz, 1990, p.47). Inspired by the proposed relationship between a discipline's discursive practice and its paradigmatic assumptions, several researchers (e.g., Firestone, 1987; Hansen, 1988; Sallinen & Braidwood, 2009) have empirically explored the expected paradigmatic influences on discursive practices

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through textual analysis, as will be discussed below.

3.2.6 The rhetoric of quantitative and qualitative research

The working model discussed in the previous section proposes that the underlying ontological and epistemological assumptions about the social world and knowledge influence and justify the employment of specific methodological approaches and methods by researchers. Working within a specific paradigm, these decisions may require particular techniques of presentation and discursive strategies to construct knowledge (Firestone, 1987). In academic writing, such as RAs, how writers select and present information, signal their stances and persuade readers are likely to bear the mark of chosen methodological approaches which, in turn, are shaped by the underlying ontologies and epistemologies of different research paradigms. As a result, researchers working in different research paradigms are likely to appeal explicitly or implicitly to those deep-seated assumptions, beliefs, and values, and utilize different rhetorical strategies in the construction and presentation of paradigm-sanctioned knowledge.

The quantitative and qualitative research paradigms, drawing on positivist/postpositivist and constructivist philosophies respectively, can be expected to differ in their discourse practices and rhetorical conventions. In a comparison of a quantitative and a qualitative study addressing the same topic in education, Firestone (1987) found that the two research reports used different persuasive strategies and reflected contrasting assumptions about the phenomena under study, namely, whether leadership can make any difference in organizational outcomes. Rhetorically, the quantitative study attempted to convince the reader by stressing the use of established procedures and effacing the individual judgment of the researcher. Specifically, much discourse space was given to the method section but there was little concrete description

of what anyone did. Instead there was a detailed discussion of sampling and measurement procedures. In contrast, the qualitative study gave less attention to procedures but provided a detailed depiction of the data analysis to convince readers of the plausibility of its conclusion (Firestone, 1987). In terms of the underlying assumptions about the social world, the quantitative study represented the world as a system of interconnected variables. A change in a particular independent variable was expected to cause a corresponding change in a dependent variable. By comparison, the qualitative study portrayed a more complex social world where people were interacting with social events. These different assumptions, as Firestone (1987) argued, "come in large measure from the way the researchers collect and process their information," and "these steps shape the nature of the final text which then reinforces those assumptions stylistically" (p. 19). Thus, the selection of particular methodological approaches is not only shaped by the researcher's worldviews but also encourages him or her to "adopt conventions of presentation that advance certain kinds of arguments for the credibility of one's conclusions" (Firestone, 1987, p.20).

Similarly, Hansen (1988) compared the rhetorical strategies of an ethnography study and a quantitative sociology survey. The two texts were found to employ very different rhetorical conventions and discursive practices (Hansen, 1988). In terms of epistemic authorial stance, the quantitative text used much speculative language to qualify its conclusions and thus appeared to be more tentative in tone. In contrast, the qualitative report was "much less tentative" in discussing its findings, and the conclusions were "more authoritatively stated than the cautious explanations" of the quantitative text (Hansen, 1988, p.195). Furthermore, the quantitative study assumed an impersonal style by suppressing the presence of the author in text, using frequent

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passive voices and impersonal sentence subjects such as *research*, *this paper*, *findings.* By comparison, the qualitative report shifted skillfully between the style of an omniscient researcher/author and that of a self-revealing storyteller. Such differences in discursive practices, as suggested by Hansen (1988), were possibly shaped by paradigmatic assumptions about "what can be known, how it can be known, and how certainly it can be known" (p. 207).

The possible connections between research paradigm and rhetoric were also explored by Sallinen and Braidwood (2009), who compared several rhetorical features between two quantitative and two qualitative RAs in health sciences. The findings revealed that when presenting results, the quantitative RAs referred to tables, used fewer self-references, and employed more impersonal sentence subjects, whereas the qualitative RAs provided more descriptions of results, used self-references frequently, and employed fewer impersonal subjects. These rhetorical differences, according to Sallinen and Braidwood (2009), were due to the argumentative and non-argumentative nature of the quantitative and the qualitative RAs, which reflected the specific epistemologies of the two research paradigms.

While the above studies point towards the looming connections between writing conventions and paradigmatic assumption, some genre-based research (e.g., Lim, 2010, 2011) fails to find such a connection. In a comparative study of the Results sections of 30 RAs sampled from applied linguistics and education, Lim (2010) examined the distribution of four commentary steps across disciplines and methodological approaches. Although the study found that the applied linguistics RAs were more likely to offer comments on results than the education RAs, it did not detect any statistically significant differences across the RAs employing quantitative, qualitative, and mixed

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methods approaches.

To sum up, although the findings from some of the studies reviewed above were strongly suggestive of close connection between the rhetorical conventions of research reporting and the underlying paradigms, no firm conclusions could be arrived at given the exploratory nature of these studies. Clearly, there is a glaring paucity of research on whether different research paradigms in the social sciences may adopt different discourse conventions and rhetorical choices in research reporting, such as the use of metadiscourse in RAs. Thus, one objective of the present study is to explore the proposed relationship between the discursive practices of a particular paradigm and its epistemology by comparing whether and how the use of metadiscourse in RAs from different research paradigms might differ from each other.

3.3. Summary

This chapter has provided a general theoretical framework for the present study. This framework theorizes about how disciplinary and paradigmatic factors may influence the knowledge construction and the discursive practices across different social science disciplines and research paradigms. With respect to disciplinary influences, I have reviewed relevant theoretical notions about hierarchical and horizontal knowledge structures (Bernstein, 1999) and the corresponding knower structures (Maton, 2000, 2007, 2010a, 2010b, 2014). Next, by proposing a continuum of knowledge-knower structures in social science disciplines, I have argued that the language of legitimation of the three disciplines under examination could be analyzed in relation to their relative positions along such a continuum.

With respect to paradigmatic influences, I have conducted a survey of the major philosophical and research paradigms prevailing in social science inquiries. While

positivism/postpositivism, constructivism, and critical theory are distinguished by their philosophical assumptions about reality and knowledge, quantitative, qualitative and mixed methods research are distinguished by the research methodologies and methods adopted. Although there has been much debate over the commensurability of the quantitative and qualitative research paradigms, it has been argued that these two paradigms can be seen as a continuum rather than as a dichotomy. Mixed methods research, which is theoretically grounded in pragmatism, can also be positioned somewhere between quantitative and qualitative research on such a continuum. The inter- and intra-disciplinary comparisons of different research paradigms indicated the relative status of quantitative, qualitative, and mixed methods across and within the disciplines of psychology, education, and applied linguistics.

The most important issue raised in this chapter concerns the connection between research paradigms and creation and representation of knowledge. Based on the proposed model, the underlying assumptions of a particular research paradigm justify the choice of the methodological approach and specific methods of data collection and analysis, which, can influence or shape the creation and representation of knowledge within that particular paradigm. Given the potential link between research paradigm and discursive practice, several research methodologists have argued for alternative ways of representing knowledge produced within non-positivist paradigms. Whereas little empirical research has explored the possible similarities and differences of the discursive practices characteristic of different research paradigms, the present study aims to investigate how quantitative, qualitative and mixed methods research may differ in their discursive practice or knowledge representation, particularly the use of metadiscourse in RAs, across the three disciplines under investigation.

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CHAPTER IV

METHODOLOGY

In the introductory chapter, I outlined my research questions and provided an overview of the methodology used for the investigation. In this chapter, I offer a more detailed account of the overall research design, and the specific methods for data collection and analysis. The overall purpose of the present study is to investigate whether and how interactive and interactional metadiscourse may vary in the RAs from the three disciplines and the three research paradigms. To approach this research problem, I adopt a mixed methods design by integrating both corpus data and interview data in answering the research questions. The purpose of the corpus-based analysis is to examine and compare the frequencies, forms, and the discourse functions of various types of metadiscourse across the selected disciplines and paradigms. In addition, the supplementary interview data are drawn to access the emic understandings of the disciplinary insiders in order to facilitate the interpretation of the findings from the corpus study. The two types of data are complementary and can provide more comprehensive answer to the research questions than when they are used separately.

In what follows, I first describe the construction of the corpus of RAs in the present study. Next, I present the specific methods I adopted to code and analyze the corpus data. Then I explain how the interviews were conducted and analyzed. I conclude the chapter with a summary of the major methodological components.

4.1 Research Design

This study adopts a mixed methods research design at the methodological level.

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One type of mixed methods research is to use qualitative data to supplement a core quantitative research project (Creswell, 2008, 2009; Morgan, 2014). According to Morgan (2014), this type of design is typically conducted sequentially in two phases. In the first phase, the researcher collects quantitative data and uses the quantitative results to provide a general picture of the research problem. This is followed by the collection of supplementary qualitative data by which the researcher attempts to provide more information about the processes that produced the original quantitative results. Clearly, this type of design places the priority on the quantitative data collection and analysis.

For the purpose of the present study, I adopted this mixed methods design and collected both quantitative and qualitative data sequentially in two phases. The first phase consisted of a primarily quantitative corpus-based study. In the second phase, results from the quantitative corpus study were used to inform a qualitative interview study. The combination of these two different types of data and analyses has the advantage of complementarity (e.g., Harwood, 2006; Hyland, 2005a). In other words, while the corpus-based analysis can provide insights into broad patterns of metadiscourse use, the interview data may balance corpus data by offering language users' perspectives on their choices and motivations for using metadiscourse in particular ways. The usefulness of the combined analyses of both corpus and interview data has been validated by a growing number of studies on the discursive practices of academic writing situated in different contexts (e.g., Chang & Swales, 1999; Hyland, 1998a, 1998b, 1999, 2000, 2001a, 2001b, 2002b, 2002c, 2002d, 2005c; Hyland & Tse, 2004; Lafuente-Millán, 2010; McGrath & Kuteeva, 2012; Swales et al., 1998).

In the quantitative part of the study, a specially designed corpus of RAs from the three social science disciplines (i.e., applied linguistics, education, and psychology)

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were constructed and analyzed for metadiscourse features. The corpus data were coded separately for methodological orientations and various functions of metadiscourse features. As will be further explicated in Section 4.2, the coding of methodological orientations of the RAs was done to facilitate the building of the corpus and for the comparison purpose. Firstly, all RAs extracted from the selected journals were coded into different research paradigms according to their methodological orientations: quantitative, qualitative or mixed methods. Next, a stratified random sampling method was used to select 20 coded RAs from each methodological group in every discipline, totaling 180 RAs for the final corpus. The coding of the target metadiscoursal features involved identifying these features and annotating their functions in the corpus. The coded data were then analyzed quantitatively and qualitatively to address the research questions.

In the follow-up interview study, semi-structured interviews were conducted with altogether 6 specialist informants from the three disciplines. The interview data were transcribed and thematically analyzed to provide additional information for interpreting the prominent patterns of the corpus findings. All participants were disciplinary insiders who were experienced researchers and writers, and were familiar with the disciplinary norms and expectations of their specific fields of study. The interviews took the semi-structured format in which, the participants were asked how and why they made choices of particular metadiscourse features and other relevant textual practices in their own writing. More detailed information regarding the interviews is provided in Section 4.3.

4.2 Corpus Data Collection and Analysis

4.2.1 Construction of the corpus

In order to answer the research questions formulated for this study, a corpus of RAs was constructed to represent the selected disciplines and research paradigms. Most corpus-based studies of academic discourse have relied on specially designed corpora rather than more general corpora to address their research questions or achieve their envisioned goals (Biber, Connor, & Upton, 2007). The present study built a corpus of RAs from three disciplines (i.e., applied linguistics, education, and psychology) and the three research paradigms (i.e., quantitative, qualitative, and mixed methods research) within these disciplines. The corpus building procedures were divided into three stages: (a) selection of academic disciplines and sub-disciplines, (b) selection of journals from the target sub-disciplines, and (c) selection of articles from the target journals. A multilevel mixed methods sampling procedure (Teddlie & Yu, 2007) was adopted in the study because the target disciplines, journals, and articles were nested within each other, and the research questions related to all three levels of sampling. In the selection of target disciplines and journals, a purposive sampling strategy was used, whereas in the selection of articles, a probability sampling strategy was adopted. It was expected that a combination of both sampling strategies could generate data necessary for answering the present research questions.

4.2.1.1 Selection of academic disciplines and sub-disciplines

Purposive sampling was used to select the disciplines or the intellectual fields of study. This method is also known as nonprobability sampling which involves "selecting units (e.g., events, people, groups, setting, artifacts), or types of units, based on a specific purpose rather than randomly" (Teddlie &Tashakkori, 2003, p. 713). The

disciplines of applied linguistics, education, and psychology were selected partly because, as noted in Section 2.4.3, although previous research in metadiscourse has made broad-brush comparisons between soft and hard disciplines (e.g., Hyland, 1998c, 2005c), little research focuses on analysis within each of these two broad domains (Hyland, 2001a). In addition, among the three disciplines selected, except for applied linguistics, education and psychology has been grossly underrepresented in cross-disciplinary research on metadiscourse. As a result, a comparative study of these disciplines could be expected to yield nuanced insights into disciplinary writing practices.

It should be noted that applied linguistics, education, and psychology each subsume a wide range of sub-disciplines and specialisms. It would be impossible to compare all these sub-disciplines and specialisms in a PhD study. By reviewing the relevant literature (e.g., Alise & Teddlie, 2010; Marchel & Owens, 2007) and by consulting some of my specialist informants from the relevant disciplines, I decided to delimit each of the three disciplines to more specific subfields: language teaching and learning in applied linguistics, learning and instruction in education with a special emphasis on science education, and clinical and counseling psychology in the discipline of psychology. Source journals were then selected from these subfields.

4.2.1.2 Selection of academic journals

In selecting academic journals from each of the chosen disciplines, I used a method of sampling involving two steps: (a) quota sampling and (b) purposive sampling. First, by quota sampling I tried to establish quotas for individual cases to be included within each strata or subgroup (Gravetter & Forzano, 2009), in this case, a number of journals within each discipline/subfield. Given the scope and resources of the present study, four

journals were selected from each of the three disciplines/subfields. Secondly, purposive sampling was adopted for selecting the most prestigious journals in each of the selected subfields, which can be expected to best represent the research and discursive practice of the particular subfields (Alise & Teddlie, 2010). In addition, research published in the most prestigious journals in a particular discipline or sub-discipline is also reflective of the prevalent research paradigms and methodologies of that particular field/subfield.

To facilitate the selection process, I also obtained information about the five-year impact factors of the journals in the three sub-disciplines from *Journal Citation Reports: Social Sciences Edition* (2011) published by Thomson Reuters. Although the five-year impact factors may not most accurately reflect the quality and influence of each individual journal, they can be used as a general guide to locate the relative position of a particular journal among its peers within a specified period of time. In addition, I also reviewed findings from some previous studies comparing journals in the same or related fields (e.g., Alise & Teddlie, 2010; Kidd, 2002) to inform my own selection. Furthermore, my specialist informants in those fields of study were also consulted about the relative prestige of the journals and the types of research published in them. Three steps were taken in the selection process. First, a shortlist of prestigious journals from each discipline/sub-discipline was identified according to (a) the degree of relevance, which was evaluated on the basis of such information as journal title, descriptions of journal aims and scopes, and (b) the five-year impact factors, which indicated the relative positions of the journals in the related disciplines/sub-disciplines. Second, the short-listed journals were further screened so that those which only published review articles were removed from the list because my focus in this study was on original, empirical RAs rather than non-empirical ones. Moreover, the selected journals should

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have enough empirical RAs for further sampling, thus those journals which published only one or two issues per year were also eliminated from the list. Finally, because qualitative research in psychology has relatively limited publishing outlets, I decided to include psychology journals that are more likely to publish qualitative RAs (e.g., *Journal of Counseling Psychology)* based on a review of previous research (Hoyt & Bhati 2007; Kidd, 2002). A finalized list of selected journals is presented in Table 4.1.

Table 4.1

A List of Selected Journals from Each Discipline

Disciplines	Journal Titles	Five-year Impact Factors (2011)
Applied Linguistics	*Applied Linguistics*	2.536
	Language Learning	1.831
	Modern Language Journal	1.954
	TESOL Quarterly	1.349
Education	*American Educational Research Journal*	3.094
	Instructional Science	1.960
	Journal of the Learning Sciences	3.081
	Learning and Instruction	3.727
Psychology	*Journal of Abnormal Psychology*	5.921
	Journal of Consulting and Clinical Psychology	6.369
	Journal of Counseling Psychology	3.844
	Journal of Family Psychology	3.096
	Professional Psychology: Research and Practice	1.486
	Psychotherapy: Theory, Research, Practice, Training	1.563

It should be noted that, whereas four journals from applied linguistics and education were selected respectively, altogether six journals were included from psychology. This was because the number of mixed methods RAs in the initially selected four psychology journals was too small to meet the quota. To ensure an equal number of quantitative, qualitative and mixed methods RAs in the corpus constructed for the present study, two more psychology journals, namely, *Journal of Family Psychology* and *Psychotherapy:*

Theory, Research, Practice, Training, were added.

4.2.1.3 Selection of RAs

After the selection of journals, the next step was to select RAs. In selecting RAs, I used a probability sampling method which involved a combination of stratified sampling with random sampling. This sampling method is typically adopted when the researcher wants the samples from each of the various subgroups of a population to be representative (Teddlie & Yu, 2007). To begin with, all RAs in the selected journals published during the five-year period of 2007-2011 were extracted and included in the sampling pool. Because my focus was on the full-length, original RAs, the non-empirical articles, such as review articles, theoretical discussions, research notes, and brief reports, were all excluded. Next, the abstract and method section of every extracted empirical RA was scanned and the RAs were coded according to their research paradigms. As a result, the coded RAs fell into three groups: purely quantitative (QUAN) RAs, purely qualitative (QUAL) RAs, and mixed methods (MM) RAs.[5] These procedures generated a pool of 1,568 purely quantitative RAs, 244 purely qualitative RAs, and 131 mixed methods RAs from the selected journals in the three disciplines. I randomly selected 20 RAs from each of the three methodological groups in each discipline, obtaining a total of 180 RAs for the corpus of the present study (see Appendix I for a list of RAs in the corpus). The fact that an equal number of RAs were selected from each subgroup was necessary to give a more balanced picture of RAs in every discipline/sub-discipline and research paradigm, and to increase the statistical power of the quantitative analysis for cross-disciplinary and cross-paradigmatic

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[5] In fact, there was a fourth miscellaneous group of RAs whose methodological orientations were not explicitly stated and could not be identified.

comparisons. Further details regarding quantitative analyses are presented in Section 4.2.3.

4.2.2 Coding of the RAs

4.2.2.1 Research paradigms of the RAs

As noted in previous section, the RAs collected in the present study were coded into different categories based on their paradigmatic orientations, namely, purely quantitative, purely qualitative and mixed methods. A coding sheet was designed to record bibliographic information about each RA, such as the discipline, journal, year of publication, article title, author(s), as well as information of methods and types of data used in the article.

To make sure my coding was consistent and reliable, it was necessary to provide precise operational definition for each category. In the present study, I followed Creswell's (2009, p. 4) definitions of quantitative, qualitative, and mixed methods research in social and educational research as reproduced in Table 4.2.

Table 4.2

Definitions of Qualitative, Quantitative, and Mixed Methods Research

Quantitative research (QUAN)	"Quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The final written report has a set structure consisting of introduction, literature and theory, methods, results, and discussion. Those who engage in this form of inquiry have assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the findings."
Qualitative research (QUAL)	"Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation."
Mixed methods research (MM)	"Mixed methods research is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study. Thus, it is more than simply collecting and analyzing both kinds of data; it also involves the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research."

By using the above definitions as a general guide, I determined whether a particular RA belonged to the group of qualitative, quantitative, or mixed methods research by assessing (a) the global research design, (b) the data collection procedures (i.e., sampling, data collection methods, and data types), and (c) the data analysis procedures.

The literature on research paradigms and methodologies has classified research by a range of specific designs. For example, quantitative research mainly included experimental, correlational, and survey designs (Creswell, 2009; Creswell & Plano Clark, 2011). Qualitative designs included five main traditions: ethnography, case study, phenomenological research, narrative research, and grounded theory (Creswell, 2009; Creswell & Plano Clark, 2011). Similarly, mixed methods research comprised a number of specific designs: triangulation, embedded, explanatory, and exploratory (Creswell, 2009; Creswell & Plano Clark, 2011).

In terms of data collection, I examined each selected RA by its sampling methods, data collection methods, and data types. Typically, probability sampling strategies were most likely to associate with quantitative research although due to practical constraints some nonprobability sampling strategies such as convenience and quota sampling methods were sometimes used (Gravetter & Forzano, 2009). For qualitative research, purposive sampling or convenient sampling was the most frequently used method. Mixed sampling techniques are generally indicative of mixed methods research. Regarding data collection procedures, several frequently used methods were distinguished: tests, questionnaires, observations, interviews, and secondary data. The collected data could be either numeric or narrative in form. Generally, numerical data were indicative of quantitative research and narrative data suggested qualitative research (Creswell, 2009). Mixed methods research could use both numeric and narrative data, or involve quantizing qualitative data (Sandelowski, Voils, & Knafl, 2009). With respect to data analysis, two broad categories were distinguished: quantitative data analysis normally consisted in descriptive and inferential statistical analyses, and qualitative data processing most likely involved content/thematic analyses (Creswell, 2009). Mixed

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methods research could make use of both types of analytic techniques either in a sequential or parallel order. By examining each of these indicators, I coded each of the RAs into different quantitative, qualitative, and mixed methods research. These groupings formed the basis for comparing paradigmatic variations across groups.

To further illustrate how I classified the RAs into different research paradigms, I will cite three RAs from the corpus to exemplify how the judgments were made. As one example, a psychology RA (PSY_QUAN20) reported an intervention study examining the relation between depression, craving and substance use following a clinical intervention called MBRP. A sample of 168 participants were randomly assigned to either a "treatment-as-usual" control group or an experimental group which received 8 weekly sessions of MBRP. The authors of the RA formulated specific hypotheses to be tested statistically and provided detailed information about the participants, measurements, intervention, and statistical analyses in the method section of the RA. Overall, this is a typical example of quantitative research.

In comparison, one RA from applied linguistics (APL_QUAL18) reported a longitudinal case study of how learning outcomes transferred from a university content-based EAP course to other courses and the reasons for that transfer. The RA authors explained that they adopted qualitative research design because their research questions were open-ended and derived from a built-in real-life context. The participants included five students, six instructors, and one administrative staff. Altogether four types of qualitative data were collected over a year-long period: interview transcripts, journal entries, classroom observation notes, and samples of instructional materials and students' coursework. In the method section, the RA authors also reported in detail how they qualitatively analyzed the interview data by identifying

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themes and patterns. Based on such information, this RA was coded as a qualitative research.

Finally, a RA from education can be seen as a typical example of mixed methods research. This article (EDU_MM13) reported a mixed method study on the validity of a teaching evaluation form (TEF) by examining university students' perceptions of characteristics of effective teachers. The RA authors reported a design where the qualitative and quantitative approaches were mixed sequentially in data analysis and interpretation, and the qualitative phase was given more weight. The data were collected by using a questionnaire of TEF with both open- and close-ended items. The data analyses included both qualitative thematic analysis (exploratory) and quantitative statistical analysis (both exploratory and confirmatory). On the basis of such information, this RA was coded as an example of mixed methods research.

It should be noted that occasionally the RAs in my samples may not provide explicit information about the design, methods of data collection and analysis. In those cases, the relevant parts of the RAs were carefully examined to see whether they could fit into the respective paradigmatic categories. However, where there was no sufficient information available in a RA, it was assigned to a fourth, miscellaneous category other than the three paradigms, and was finally excluded from sampling.

4.2.2.2 Selecting 'post-method sections' of the RAs

Most metadiscourse research has focused on the genre of RAs, which is not surprising given its importance in knowledge-making and communication. In Swales' (1990) words, it represents the "key product of the knowledge-manufacturing industry" (p.125). The research on metadiscourse has focused either on the whole RA (e.g., Hyland, 1999, 2005c; McGrath & Kuteeva, 2012) or on its part-genres such as Abstract

(e.g., Gillaerts & Van de Velde, 2010; Khedri et al., 2013; Hu & Cao, 2011), Introduction (e.g., Bondi, 2010; Del Saz-Rubio, 2011), Discussion (e.g., Abdi, 2002; Pérez-Llantada, 2010), or Conclusion (e.g., Abdollahzadeh, 2011). In the present study, I decided to focus on a macro-structure comprising several part-genres, namely, Results, Discussion, and Conclusion or their equivalents in the RAs. This part of an RA, unlike Introduction or Method, seems to show more variations in terms of discourse structure (Swales, 1990). Firstly, it could be observed in the present corpus that the Results and Discussion sections were sometimes coalesced, and headings such as Conclusions, Implications or Applications were used to refer to those "additional or substitute sections" (Swales, 1990, p. 170). Secondly, the boundary of the part-genre of Discussion was often blurred and displayed many inconsistencies from one RA to another (Swales, 2004). To respond to this variability, Swales (2004) proposed to label all sections near the end of the RA as "After the Results" (p.235). In a similar vein, I used a cover term, "post-method sections", to refer to all the relevant part-genres under investigation in the present study. The choice of post-method sections for analysis was primarily motivated by two considerations. Firstly, the post-method sections are the very parts of RAs where writers present their findings and stake out their claims (Holmes, 1997; Yang & Allison, 2003). It is likely that these RA sections contain many writer-reader interactions, and, consequently, are ideal for investigating metadiscourse use. Whereas RA introductions, which may as well contain intensive writer-reader interactions, have been frequently investigated in relation to metadiscourse (e.g., Bondi, 2010; Del Saz-Rubio, 2011; Loi & Lim, 2013), little research so far has focused on metadiscourse in RA discussions, let alone post-method sections. A second motivation arose from more practical considerations. A preliminary survey of the RAs in the corpus

showed that there were generic variations between RAs from the different research paradigms. Although many quantitative RAs tended to follow more or less strictly the model of IMRD (Introduction-Method-Results-Discussion) in reporting research (Swales, 1990), some RAs, particularly qualitative ones, were structured in different ways, and often no explicit labels like Results/Discussion were used for reporting (cf. Lin & Evans, 2012). If only the RAs employing the standard IMRD structure were compared, a large number of the qualitative RAs would be excluded. The remaining qualitative RAs may not represent the qualitative research paradigms well. One possible solution was to compare functionally equivalent parts in the RAs from all three research paradigms which may share similar rhetorical purposes despite the various labels used. A closer reading of the qualitative RAs suggested that these RAs contained corresponding sections which might separately or jointly function as the part-genres of Results, Discussion or Conclusion, as in the quantitative RAs. Thus, the choice of the 'post-method sections' would enable me to establish common ground for comparison between the RAs in the corpus that represented the different research paradigms.

Each selected RA was removed of its title, abstract, references, notes, figures, tables, excerpts of data, and block quotations, and the post-method sections were converted to plain text format for corpus analysis. The final corpus comprised 180 post-method RA sections equally divided among the three disciplines and three paradigms (see Appendix I for a list of 180 RAs in the corpus), making a total of 852,690 words. A summary of the corpus information is provided in Table 4.3.

Table 4.3

A Profile of the Corpus

	Quantitative research			Qualitative research			Mixed methods research		
	RA	No. of words	*M*	RA	No. of words	*M*	RA	No. of words	*M*
Applied linguistics	20	80,120	4,006	20	97,644	4,882	20	102,042	5,102
Education	20	67,567	3,378	20	140,150	7,008	20	109,893	5,495
Psychology	20	69,572	3,479	20	100,810	5,041	20	84,892	4,245
Total	60	217,259	3,621	60	338,604	5,643	60	296,827	4,947

4.2.3 Coding of metadiscourse

4.2.3.1 Analytical framework

As discussed earlier in Chapter 2, metadiscourse researchers have proposed a number of analytical frameworks for classifying metadiscursive resources. While several researchers (e.g., Ädel, 2006; Mauranen, 1993a, 1993b) argued for a narrow conceptualization by restricting metadiscourse to reflexive textual elements or metatext, most other scholars (e.g., Hyland, 2005b; Vande Kopple, 1985, 2002) preferred a more broad view of metadiscourse by incorporating both textual and interpersonal elements as metadiscourse. Given the influence of the inclusive view, I chose to use Hyland's (2005b, see also Hyland & Tse, 2004) interpersonal model of metadiscourse as the basis for an analytical framework for this study. This framework covered a wide range of lexico-grammatical forms used to express functions of both textual and interpersonal meanings. Table 4.4 provides a list of the main types and the respective subtypes of interactive and interactional metadiscourse with examples extracted from my corpus.

Table 4.4

An Analytical Framework of Interactive and Interactional Metadiscourse

Main Type	Subtype	Function	Example
Interactive metadiscourse			
Code glosses	Exemplifiers	to elaborate meaning with examples	*for example*, *for instance*, *e.g.*
	Reformulators	to rephrase a previous discourse unit	*in other words*, *that is*, *i.e.*
Transitional markers	Additive	to express relations of addition	*in addition*, *furthermore*, *moreover*
	Comparative	to express relations of comparison or contrast	*similarly*, *however*, *in contrast*
	Inferential	to express relations of cause and effect	*thus*, *therefore*, *as a result*
Frame markers	Sequencers	to order discourse-internal units	*first*, *second*, *finally*
	Topicalizers	to shift between topics	*with regard to*, *concerning*, *turning to*
	Discourse-labels	to label discourse stages	*thus far*, *in sum*, *in brief*
	Announcers	to announce discourse goals	*aim to*, *will*, *seek to*
Endophoric markers	Linear references	to refer to the unfolding text	*the next section*, *as noted earlier*, *in this paper*
	Non-linear references	to refer to visual representations of the text	*see Table 1*, in *Figure 2*, *as demonstrated in Excerpt 3*
Evidential markers	Integral citations	to integrate the cited source into the text	*according to X*, *as Y argued*, *in Z's study*
	Non-integral citations	to exclude the cited source from the text	"…" (X, 2013), …previous research[1,2,3]

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Interactional metadiscourse

Hedges		to mitigate the degree of certainty or commitment	*may, might, possible, perhaps, suggest, indicate*
Boosters		to increase the degree of certainty or commitment	*will, demonstrate, show,*
Attitude markers		to express affective attitudes or emotions	*should, need to, interesting, surprisingly*
Self-mentions		to mark writer's explicit presence in text	*I, we* (exclusive), *me, us, the author (researcher) my, our*
Engagement markers	Directives	to refer readers to actions	*see, note, should*
	Reader references	to make reference to readers	*you, we* (inclusive), *the reader(s)*
	Questions	to anticipate readers' questions	rhetorical and real questions
	Knowledge appeals	to make reference to shared knowledge	*well-known, obviously*
	Personal asides	to address readers through interjections	*(which I discuss later)*

As shown in Table 4.4, this analytical framework made a similar distinction between interactive and interactional metadiscourse, as Hyland (2005b) did. In what follows, each main type and subtype of interactive and interactional metadiscourse will be defined and illustrated with examples from my corpus data. Code glosses, the first main type of interactive metadiscourse, is used to explain, elaborate, or rework propositional meanings. Two subtypes of code glosses are distinguished functionally: exemplifiers and reformulators (Hyland, 2007). In academic discourse, exemplifiers (e.g., *for example*, *such as*) illustrate through examples, whereas reformulators (e.g., *that is*, *in other words*) rework a previous discourse unit for specification or elaboration (Cuenca & Bach, 2007; Hyland, 2007). An appropriate use of code glosses in RAs can elaborate on meaning and help readers grasp propositional information.

Another main type of interactive metadiscourse, transitional markers, helps create textual cohesion by signaling logical links between propositions. This type of metadiscourse comprises what is variously termed "internal conjunctions" (Martin & Rose, 2007, p.116), "linking adverbials" (Biber, Johanssan, Leech, Conrad, & Finegan, 1999, p.875) or "logical markers" (Mur-Dueñas, 2009, p.248). In this study, transitional markers were restricted to inter-sentential devices only. As mentioned in Section 2.4, Hyland (2005b) included intra-sentential connectors, such as *because*, *although*, and *since,* as metadiscourse. However, following previous studies (e.g., Gardezi & Nesi, 2009; Mur-Dueñas, 2009), such intra-sentential connectors were excluded from metadiscourse because they were used primarily for grammatical purposes rather than as metadiscursive logical markers. Based on their discourse functions, transitional markers were further classified into three subtypes: addition (e.g., *moreover*, *in addition*), comparison (e.g., *similarly*, *in comparison*) or contrast (e.g., *however*, *by*

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contrast), and inference (e.g., *therefore*, *consequently*). The appropriate use of transitions can ease the reader's burden of making connections between preceding and subsequent propositional information.

Frame markers, another main type of interactive metadiscourse, are used primarily to organize texts for readers. Frame markers are a cover term for a variety of linguistic devices which can be further categorized into four subtypes according to their functions: sequencers, topicalizers, discourse-labels, and announcers. Sequencers (e.g., *first*, *second*) are used to structure the text into sequences; topicalizers (e.g., *in regard to*, *concerning*) to signal the shift from one topic to another; discourse-labels (e.g., *in summary*, *thus far*) to mark the stages of textual development; and announcers (e.g., *aim to*, *seek to*) to indicate discursive purposes. In this study, "linguistic elements relative to space" (Hempel & Degand, 2008, p.681), such as *on the one hand* and *on the other hand*, were included as "spatial sequencers" when they introduced new sequences in a text, but were classified as comparative transitions when used to indicate logical relation. Together, frame markers can provide structures for the discourse and indicate textual boundaries.

Endophoric markers are reflexive language used to refer to other parts of a text. Also known as "text references" (Bunton, 1999, p.s45) or "locational metatext" (Dahl, 2004, p.1811), this main type of metadiscourse is used as signposts, guiding the reader through the text. Informed by Bunton's (1999) study, I extended Hyland's (1998c, 2005b) category of endophoric markers functionally by making a distinction between linear and non-linear references. Linear references function as previews, reviews, or overviews in the unfolding text, whereas non-linear references refer to additional textual materials such as tables, figures, stand-alone examples or extracts. By making

references to the unfolding text, endophoric markers can guide readers through the text by pointing to relevant information and lead readers toward an intended interpretation of the discourse (Hyland, 2005b).

As a final main type of interactive metadiscourse, evidential markers present information from other texts (Hyland, 2005b). In academic discourse, evidential markers typically take the form of citations (Hyland, 1999; Swales, 1990). Two subtypes of evidential markers can be distinguished according to surface forms: integral and non-integral citations (Swales, 1990). An integral citation incorporates a cited source as part of the reporting sentence, whereas a non-integral citation places a cited source within parentheses or via a superscript number leading to a footnote, endnote or bibliography. A judicial use of evidential markers in academic writing not only provides support for arguments but indicates one's membership of a particular disciplinary community (Hyland, 1999).

While interactive metadiscourse guides readers through the text, interactional metadiscourse can explicitly express the writers' stance and bring readers into a virtual dialogue with the writers. Hedges are a major type of interactional metadiscourse used to mitigate writers' commitment towards propositions (Hyland, 2005b) or to attenuate the imposition of face-threatening acts (FTAs) in academic writing (Myers, 1989). In written discourse, hedges could be realized by a variety of linguistic forms, such as epistemic modal verbs (e.g., *could*, *may*), lexical verbs (*indicate*, *suggest*), adverbs and adjectives (*possible*, *probably*,), nouns (*likelihood*, *possibility*), and phrases showing various levels of tentativeness or qualification (*in general*, *to some extent*). The importance of hedges in academic writing has been well documented in numerous studies (e.g., Hyland, 1996a, 1996b, 1998a, 1998b; Myers, 1989; Salager-Meyer, 1994;

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Skelton, 1997; Vold, 2006).Through a wise choice of hedges, RA writers could present their knowledge claims with appropriate level of qualification and appear both as "humble servants" (Myers, 1989, p. 4) of their disciplines and originators of new knowledge claims.

Contrary to hedges, boosters, another main type of interactional metadiscourse, can increase writers' degree of certainty of the propositional content (Hyland, 2005b). Similarly to hedges, boosters in written discourse could be realized by epistemic modal verbs (e.g., *must*, *will*), lexical verbs (*demonstrate*, *show*), adjectives and adverbs (*clear*, *undoubtedly*), nouns (*fact*, *conclusion*), and other linguistic expressions (*without a doubt*). The use of boosters in academic writing not only can accentuate writers' epistemic stance, but can also promote the solidarity with readers (e.g., Hyland, 1998a; Peacock, 2006; Skelton, 1997).

The use of attitude markers expresses a writer's evaluative and affective attitudes towards propositions (Hyland, 2005b). The linguistic resources of this type of interactional metadiscourse include primarily modal verbs of obligation (e.g., *must*, *should*), attitudinal adverbs (e.g., *interestingly, surprisingly*), and other expressions of stance or evaluation (e.g., *what is important*, *it is necessary*). Evaluation in academic discourse appears to reflect the value system or ideology of a particular disciplinary community (Hunston, 2000; Thetela, 1997), which can help writers to persuade readers with shared values and ideology.

Another main type of interactional metadiscourse is self-mentions which allow writers to explicitly signal their presence in texts. Self-mentions are realized mainly by the first-person pronouns (exclusive *we*, *I*, *us*, *me*) and determiners (*our*, *my*) in the present corpus. The use of the first-person pronouns can fulfill different interpersonal

functions in RAs, ranging from discourse organization to negotiating knowledge claims, as documented by a multitude of previous studies (e.g., Harwood, 2005a, 2005b; Hyland, 2002a; Lafuente-Millán, 2010; Tang & John, 1999).

Whereas hedges, boosters, attitude markers, and self-mentions are primarily writer-oriented metadiscourse, the use of engagement markers shows a writer's awareness of "the-reader-in-the-text" (Thompson, 2001, p.60). As a cover term for resources explicitly involving readers in a virtual dialogue (Hyland, 2001a), engagement markers include five subtypes of metadiscursive resources. 'Directives' refer readers to particular actions through imperatives (e.g., *note, see*), modal of obligations, (e.g., *should*, *ought to*), and *it*-clauses (e.g., *it is important to remember*); 'reader references' make direct references to readers by the second-person pronouns (*you*, *your*) and inclusive first-person plural pronouns (*we*, *our*), as well as indefinite pronouns (*one*); 'questions' engage readers overtly by asking both rhetorical and real questions; 'knowledge appeals' are expressions used to position readers within shared disciplinary understanding (e.g., *it is well-known*); 'personal asides' are expressions addressed to readers by interrupting on-going discourse, which typically occur within parentheses or between dashes. As suggested by previous research (Hyland, 2001a, 2005c; McGrath & Kuteeva, 2012), when appropriately used in academic writing, engagement markers could involve readers in constructing persuasive arguments.

In sum, this analytical framework was largely a modified version of Hyland's (2005c) model whose usefulness has been validated by an growing number of empirical studies on the use of metadiscourse in academic writing (e.g., Abdollahzadeh, 2011; Del Saz-Rubio, 2011; Gillaerts, & Van de Velde, 2010; Hyland, 2005c; Khedri, et al., 2013; Li & Wharton, 2012; McGrath & Kuteeva, 2012). However, as noted earlier in Section

2.3, two supplementary criteria (i.e., non-propositional and discourse-internal) have been added to Hyland's functional approach to identify metadiscourse features, which could further enhance the reliability of data coding process.

4.2.3.2 Data coding

In this study, all the metadiscourse in the post-method RA sections was manually annotated, with the assistance of the UAM Corpus Tool (version 2.8; O'Donnell, 2012). First, a coding scheme was established by using the UAM Corpus Tool on the basis of the analytical framework adopted in this study (Table 4.4). Then, all collected data were transported into the software, and manual coding was conducted to identify segments and assign those segments into different metadiscursive categories. The use of UAM Corpus Tool facilitated the manual coding process by recording coded results, computing frequencies, and performing initial analysis. Although manual coding is extremely time-consuming, it has its own advantages when the corpus is relatively manageable in scale (e.g., Abdi et al., 2010; Kuhi & Behnam, 2011). As metadiscourse is primarily a functional concept, it normally requires the researcher's interpretation to decide whether or not certain linguistic forms can serve as metadiscourse in the given contexts. Thus manual coding was necessary in this study, and retrieving tokens by automatic searching would not be conducted.

In annotating metadiscourse in the corpus, I took two crucial steps. First, I identified metadiscourse in the text and distinguished it from propositional discourse, and second, I categorized every instance of identified metadiscourse into specific functions. Where problematic cases arose in this process, the contexts of use were scrutinized for information that supported a particular interpretation. While metadiscourse is known to be a fuzzy concept (Hyland, 2005b), and a linguistic form

may serve as metadiscourse in one context but not in another, it may not always be straightforward to distinguish metadiscourse from propositional content. With this caveat in mind, where some linguistic forms can be used as both metadiscourse and propositional discourse, I had to identify and code each instance of metadiscourse with the help of its co-text or context and exclude items that could be used as metadiscursive devices elsewhere but expressed propositional content in that particular context. As an example, when *thus far* was used in "areas that *thus far* have received little attention from language socialization researchers…" (APL/QUAL11), it was not coded as a frame marker because it referred to a temporal location external to the discourse; however, it was included as a frame marker in "*Thus far*, we have used broad strokes to paint a picture of parental involvement…" (EDU/QUAN04) because it functioned as a discourse-label in this context, referring to discourse-internal relations. Another example of multiple functions of a single linguistic expression is the verb *show*. Where it was used to mean 'display', as in "Figure 1 *shows* the flow of participants from screening through follow-up" (PSY/QUAN13), it was not considered as an instance of metadiscourse. However, when the same verb was used to express the epistemic meaning of certainty, as in "the present study *shows* that this assumption is not justified" (EDU/QUAN09), it was coded as a booster, and thus a part of metadiscourse.

Furthermore, since metadiscourse is known to be multifunctional (Hyland, 2005b), no one-to-one correspondence can be mapped between a linguistic form and a metadiscoursal function. A particular metadiscoursal token may fulfill different functions and should be examined within its specific context of use. For example, the modal verb *should* can function as a hedge when expressing epistemic meaning, as in "among the four positions, the first position *should* show no difference in RT because…"

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(APL/QUAN01). Alternatively, it could be used as an attitude marker when expressing deontic meaning, as in the clause "facilitators *should* intervene if they see a problem, but the intervention *should* be strategic" (EDU/QUAL20). What's more, it could also be used as a directive when the writer is explicitly addressing to readers, as in "it *should* be noted that there were no significant interaction effects, as is shown below" (PSY/QUAN15). Because of their multiple functions, potential instances had to be examined closely in their contexts, and their specific functions could only be ascertained by manual coding.

In addition, I also used the list of metadiscourse features appended in Hyland's (2005b) monograph as a point of departure for data coding, with full awareness that metadiscourse has been an open category to which new items could be added (Hyland, 2005b). A preliminary examination of the corpus led me to add to my coding scheme items of interactive metadiscourse not found in Hyland's list. For instance, although such non-linear references as *excerpt*, *episode*, *appendix* did not appear in Hyland's (2005b) list and were excluded by Dahl (2004), they were found to be important metadiscoursal devices in my corpus. A complete list of coded metadiscoursal features in the corpus can be found in Appendix II.

To assess the reliability of the data coding, 5% of the corpus data was independently coded by a second coder who was a doctoral candidate specializing in academic writing. The second coder received training in several sessions and was provided a coding scheme comprising definitions, explanations, examples, and detailed instructions about coding. There was perfect agreement between the two coders in classifying the RAs according to their paradigmatic orientations as qualitative/quantitative/mixed methods. As regards the coding of interactive

metadiscourse, 809 instances were identified, and inter-rater agreement was assessed with Cohen's kappa separately for each of the five main types of interactive metadiscourse examined in this study. The kappa statistics ranged from .78 (frame markers) to 1.00 (evidential), indicating good reliability. Regarding the coding of interactional metadiscourse, 829 instances were identified and coded. The kappa statistics of the five main types of interactional metadiscourse ranged from .71 (boosters) to .98 (self-mentions), again indicating a good reliability between the two coders. Furthermore, the two raters resolved their disagreements through discussion. Given the acceptable reliability indexes, I coded the remaining RAs.

4.2.3.3 Data analysis

The coded data were analyzed both quantitatively and qualitatively. To partly address my research questions, namely, whether there are any differences in the use of both interactive and interactional metadiscourse across the disciplines and research paradigms, I analyzed the corpus data quantitatively by following Field's (2009) suggestion of factorial ANOVAs. Before conducting these analyses, assumptions of normality of data distribution as well as homogeneity of variances were checked to ensure the appropriateness of the chosen statistics. The quantitative analyses (using IBM-SPSS version 21.0) were comprised of a series of 3×3 between-groups analyses of variance (ANOVA) to examine disciplinary (applied linguistics versus education versus psychology) and paradigmatic (quantitative versus qualitative versus mixed methods) effects on the normalized frequencies (per 1,000 words) of each main type and its subtypes of interactive and interactional metadiscourse. Where there was a significant main effect of discipline or paradigm, following Field's (2009) recommendation, a Bonferroni test was used to make post hoc pairwise comparisons

among the three disciplines or the three paradigms. For the qualitative analysis, I studied every instance of interactive and interactional metadiscourse in its context and examined its form and discourse function(s) in that particular context. Corpus-based procedures such as frequency and collocation (Hunston, 2002) were employed to examine how the various main types and subtypes of metadiscursive resources were used similarly or differently across the disciplines and the research paradigms. Frequent patterns of use were analyzed for their rhetorical purposes or discourse functions in the specific post-method RA sections.

4.3 Interview Data and Analyses

In the second phase of this the mixed methods study, qualitative, semi-structured interviews (Cohen et al., 2011) were conducted to flesh out and gain insights into patterns of use that emerged from the corpus analyses. It should be noted that the type of interview in this study was used more as a research instrument than a social practice (Brinkmann, 2010, Talmy, 2010). In other words, interview data were considered as " 'reports' of respondents' biographical, experiential and psychological worlds" rather than " topics of investigation" themselves (Talmy, 2010, p.131). While the corpus-based study aimed to detect broad patterns of metadiscourse use across the paradigms and the disciplines, the interview data or "talk around texts" were collected to supplement the corpus analysis and to extend "the researcher-analyst's gaze beyond the text" (Lillis, 2008, p.361). As noted by Hyland (2005a), although corpus results may reveal what writers do, stopping at quantitative data "runs the danger of reifying conventions rather than explaining them" (p.183).The qualitative data therefore played a supportive role to the quantitative data, and the in-depth interviews with those experienced and published researchers enabled me to explore their perceptions of the discipline- and

paradigm-specific discourse conventions. As the interviews involved human participants, ethical clearance was obtained from the Institutional Review Board of Nanyang Technological University. All participants were approached via email (see Appendix III for a sample letter of invitation) and their informed consent was obtained before the interviews (see Appendix IV for a copy of participant information sheet and consent form).

The guides used for the interviewing included both general questions and text-based, specific questions (see Appendix V for a sample of the questions). The general questions were concerned with research paradigms and methods (e.g., *what are the predominant research paradigm(s) in your research field? Do you have any preference for certain research methods?*). The text-based questions incorporated elements from the discourse-based interview proposed by Odell, Goswami, and Herrington (1983). Before the interview, each participant was asked to provide one recent empirical RA written by himself/herself, and, on the basis of the findings of the corpus study, I identified and highlighted the most typical interactive and interactional metadiscoursal features in the provided RA. During the interview, the participants were asked questions concerning the highlighted features of metadiscourse in their own written RAs. For instance, a typical question about the use of endophoric markers in a RA was:

"In your article, there are some references to the text, such as *the following sections describe*, *in the following subsections*, *in this final section, we discuss*; what are the functions of these references in the text?"

Similar questions were developed for other relevant metadiscoursal features identified in the RAs, and the participants were asked about their motivations for and perceptions about the use of such features in their own writing. Although such elicited

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accounts about their own writing, as cautioned by Hyland (2000), were socially constructed and might vary in different interviewing situations, it is arguably "the most effective way of bringing the insider's perspective to the analysis" and could offer a closer "description of cultural practices in terms of its members' understandings" (p.144). Variants of the discourse-based interview have been frequently used in research on academic writing, particularly research on English for academic purposes (Lillis, 2008). Such interviews have been employed to study various types of discursive practices in academic writing, such as the use of personal pronouns (e.g., Harwood, 2006, Hyland, 2001b), citations (e.g., Harwood, 2009; Hyland, 1999), hedges and boosters (e.g., Hyland, 1998a), and other various metadiscoursal features (e.g., Hyland, 2005c; Hyland & Tse, 2004).

Altogether I interviewed six participants, with one quantitative-oriented and one qualitative-oriented researcher from each of the three disciplines (Table 4.5). These participants were approached because they were faculty members in each of the subdisciplines selected for this study and all were regular readers of and contributors to some of the selected journals in the corpus. In terms of their academic positions, three participants were full professors, one associate professor, and two assistant professors. Four of the participants were from two local universities in Singapore, and the other two, one from applied linguistics and the other from education, were visiting professors from two different American research universities. Although my participants differed in terms of their academic backgrounds, all were experienced researchers and were familiar with the writing practices and rhetorical conventions of their disciplinary communities.

Table 4.5

A Profile of the Participants for Interview

Participant	Discipline	Paradigm	Title
Interviewee APL1	Applied linguistics	Qualitative	Full professor
Interviewee APL2	Applied linguistics	Quantitative	Full professor
Interviewee EDU1	Education	Qualitative	Full professor
Interviewee EDU2	Education	Quantitative	Assistant professor
Interviewee PSY1	Psychology	Qualitative	Associate professor
Interviewee PSY2	Psychology	Quantitative	Assistant professor

All the interviews were conducted in 2013 and in the interviewees' offices in the two local universities. The flexibility of the semi-structured interview format allowed me to gather information about specific uses of metadiscoursal features on the one hand and to give the participants opportunities to raise other important issues during discussion on the other.

The duration of the interviews ranged from 45 minutes to 1 hour, and all were audio-recorded and transcribed. To analyze the interviews, I read all the transcripts several times to familiarize myself with the views and contents. Next, I adopted a qualitative coding method (Saldaňa, 2009) to first categorize interview data into "chunks" according to its relevance to different main types of metadiscourse. Then I examined every chunk and tried to identify recurring categories and salient themes related to metadiscourse use. As Hyland (2005a, p.186) noted, what is important in this process was to see "plausibility", that is, to make sense of data by combining an intuition informed by the literature, the frequencies and relationships identified by the textual analyses and the perspectives of the different participants.

In summary, the qualitative interviews involved selecting features through the filter of my theories and interests and eliciting the views of the informants towards the

writing practices of the disciplinary communities. These interviews sought to provide disciplinary insiders' accounts of the social and institutional influences on the use of metadiscourse in the post-method sections of RAs.

4.4 Summary

To address the research questions, the present study adopted a mixed methods design to achieve both confirmatory and exploratory purposes. Quantitative, corpus-based analyses were conducted first to identify general patterns of metadiscourse use across the disciplines and the research paradigms. Next, based on the corpus findings, a qualitative, interview analysis was carried out to explore individual perceptions and beliefs about the rhetorical practices of their particular disciplinary communities, with particular attention to paradigmatic assumptions and beliefs valued by the academic communities. The combination of the corpus study and the interview study in the same project were expected to provide a more comprehensive picture of the phenomenon under investigation.

CHAPTER V
FINDINGS AND DISCUSSION:
INTERACTIVE METADISCOURSE

This chapter presents and discusses the use of interactive metadiscourse across the disciplines and the research paradigms. As pointed out earlier in the description of the analytical framework developed for this study, the primary function of interactive metadiscourse is to organize the discourse and ease readers' burden in processing information by providing necessary textual signposts and guides. The main types of interactive metadiscourse examined in this study included code glosses, transitional markers, frame markers, endophoric markers, as well as evidential markers. Each of the main types was further divided into subtypes according to their discoursal meanings and/or rhetorical functions. In what follows, I first present the results from both quantitative and qualitative analyses of each main type and its subtypes of interactive metadiscourse used across the different disciplines and the research paradigms. Then I discuss the observed cross-disciplinary and cross-paradigmatic variations in the use of interactive metadiscourse in relation to the different knowledge-knower structures of the three focal disciplines and the different epistemological stances characteristic of the three focal research paradigms. Extracts from interviews with the specialist informants are also drawn upon to support interpretations where relevant.

5.1 Findings

5.1.1 Overview of interactive metadiscourse in the corpus

Table 5.1 reports the descriptive statistics for interactive metadiscourse by

discipline and paradigm. In terms of relative frequencies (normalized to 1,000 words), transitional markers were the most frequently used interactive metadiscourse type in this corpus, followed by evidential markers, code glosses, endophoric markers and frame markers. Table 5.1 also indicates considerable variation between the disciplines and/or the paradigms in the use of interactive metadiscourse. In what follows, quantitative and qualitative results regarding each main type and subtype of interactive metadiscourse are presented in the same order as shown in Table 5.1.

Table 5.1

Means and Standard Deviations of Interactive Metadiscourse by Discipline and Paradigm[6]

| Types and subtypes | Applied Linguistics | | | | | | Education | | | | | | Psychology | | | | | |
| | QUAN | | QUAL | | MM | | QUAN | | QUAL | | MM | | QUAN | | QUAL | | MM | |
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Code glosses	4.09	2.53	3.50	2.19	3.42	1.57	4.15	1.77	3.45	1.64	4.09	2.14	4.95	2.60	4.32	2.40	4.33	2.10
Exemplifiers	2.39	1.78	2.45	1.79	2.12	1.47	2.00	0.98	2.49	1.36	2.49	1.24	3.06	2.00	3.33	2.18	3.41	1.88
Reformulators	1.71	1.15	1.05	1.09	1.27	1.00	2.10	1.06	0.86	0.68	1.52	1.62	1.89	1.26	0.99	0.85	0.92	0.61
Transitional markers	6.21	2.40	4.81	1.69	4.73	1.49	6.15	2.65	4.16	1.86	4.60	1.67	5.38	2.33	3.86	1.77	4.88	1.73
Additive	1.08	0.71	1.12	0.66	0.84	0.50	1.52	1.14	1.02	0.82	1.14	0.92	1.33	1.13	1.30	0.91	1.25	0.69
Comparative	3.16	1.63	2.73	1.28	2.79	0.99	3.23	1.45	2.28	0.99	2.71	1.06	2.60	0.96	1.79	0.70	2.42	1.05
Inferential	1.96	1.17	0.96	0.61	1.09	0.80	1.40	1.13	0.86	0.54	0.75	0.65	1.43	0.93	0.78	0.87	1.22	0.94
Frame markers	2.74	1.88	2.02	1.20	2.17	1.47	3.29	2.24	2.10	1.62	2.10	1.11	2.58	1.57	1.34	1.08	1.98	1.30
Sequencers	1.50	1.22	1.23	1.06	1.23	1.13	2.27	1.96	1.34	1.20	1.44	0.98	1.80	1.26	0.96	0.85	1.15	0.95
Topicalizers	0.55	0.77	0.28	0.35	0.27	0.45	0.36	0.54	0.16	0.22	0.32	0.54	0.36	0.53	0.12	0.13	0.40	0.65
Discourse-labels	0.34	0.34	0.21	0.22	0.40	0.36	0.47	0.45	0.21	0.26	0.25	0.31	0.41	0.42	0.22	0.36	0.39	0.30
Announcers	0.35	0.67	0.28	0.36	0.23	0.28	0.18	0.30	0.39	0.57	0.09	0.14	0.02	0.07	0.04	0.10	0.04	0.07
Endophoric markers	3.19	1.61	3.11	2.79	3.29	1.62	3.13	1.07	2.78	2.60	3.14	1.68	2.80	1.45	0.73	0.67	1.85	1.74
Linear	0.96	0.76	1.17	0.85	1.28	1.16	0.84	0.64	0.83	0.76	0.63	0.55	0.30	0.39	0.36	0.36	0.48	0.38
Non-linear	2.24	1.14	1.94	2.42	2.01	0.93	2.30	0.81	1.94	2.46	2.50	1.35	2.50	1.27	0.37	0.62	1.38	1.65
Evidential markers	4.39	2.71	4.41	2.69	3.63	2.47	4.46	2.31	3.39	2.45	3.66	1.81	5.05	2.25	3.75	1.79	4.35	2.31
Integral	1.91	1.50	1.62	1.38	1.89	1.92	1.08	0.95	0.97	1.20	0.83	0.66	0.85	1.01	0.82	0.67	1.02	1.15
Non-integral	2.48	1.98	2.78	2.11	2.34	1.92	3.38	2.18	2.41	1.95	2.87	1.93	4.21	1.93	2.92	1.61	3.33	1.75
Total	20.63	7.04	17.86	4.54	17.24	5.50	21.18	5.66	15.87	4.98	17.58	5.15	20.76	6.20	14.00	5.41	17.39	5.00

[6] See Table 5.2 on p.188 for statistically significant results of comparsions across disciplines and paradigms.

5.1.2 Code Glosses

5.1.2.1 Code glosses as a whole

Code glosses are a main type of interactive metadiscourse used to explain, elaborate, or rework propositional meanings in discourse (Hyland, 2005b, 2007). Overall, the ANOVA run on code glosses as a main type yielded neither a significant main effect of discipline, F (2, 171) = 2.62, p =.076, η_p^2 =.030, nor a significant main effect of paradigm, F (2, 171) = 1.43, p =.244, η_p^2 =.016, showing that there were neither cross-disciplinary nor cross-paradigmatic differences in the incidence of code glosses. In other words, the frequencies of code glosses were similar in the applied linguistics (M=3.67, SD = 2.12), the education (M=3.89, SD = 1.86), and the psychology (M=4.53, SD = 2.35) RAs, as well as among the quantitative (M=4.40, SD = 2.32), the qualitative (M=3.76, SD = 2.11), and the mixed methods (M=3.95, SD = 1.96) RAs. Further, there was no significant interaction between discipline and paradigm, F (4, 171) = 0.20, p =.939, η_p^2 =.005.

As mentioned in the previous chapter, two subtypes of code glosses can be distinguished in terms of discourse function: exemplifiers and reformulators. As shown in Table 5.1 there were more exemplifiers than reformulators in the corpus. In the following subsections, I first present the quantitative and qualitative results concerning exemplifiers, and then those regarding reformulators.

5.1.2.2 Exemplifiers

The ANOVA run on the subtype of exemplifiers revealed that there was a significant main effect of discipline, F (2, 171) = 6.382, p = .002, η_p^2 = .069, although the main effect of paradigm was non-significant, F (2, 171) = 0.427, p = .653, η_p^2 = .005. The effect size indicated that discipline as an independent variable accounted

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for about 7% of the variance in the use of exemplifiers, exceeding the criterial value suggested by Cohen (1988) for a medium effect (i.e., η_p^2 = .058). No significant interaction between paradigm and discipline was found, F (4, 171) = 0.307, p = .837, η_p^2 = .007. While the frequencies of exemplifiers among the quantitative (M = 2.48, SD = 1.68), qualitative (M = 2.76, SD = 1.82), and mixed methods RAs (M = 2.67, SD = 1.62) did not different from each other, Bonferroni post hoc tests comparing the disciplines revealed that the psychology RAs (M = 3.27, SD =1.99) used exemplifiers significantly more frequently (p =.007) in both cases than the education RAs (M = 2.33, SD = 1.21) and the applied linguistics RAs (M = 2.32, SD = 1.66). The latter two groups did not show significant differences in the use of exemplifiers (p =1.000).

Exemplifiers in the present corpus were most frequently realized by the linguistic forms such as *for instance*, *for example*, *e.g.*, *such as*, which accounted for an overwhelming majority of the total exemplifiers (for a complete list of exemplifiers and other metadiscoursal features, see Appendix I). Although the quantitative analyses showed clear disciplinary differences in terms of relative frequencies, the functions of exemplifiers in this corpus appeared to be similar across the paradigms and the disciplines. The textual analysis indicated that exemplifiers were most typically used to present specific instances of general propositions (Examples 1, 2, and 3), to list similar or parallel cases (Examples 4 and 5), or to explain some abstract and technical concepts via more accessible examples (Examples 6 and 7):

(1) The lack of differences among the clusters for the common factors related to role/structure might suggest that all therapies were perceived by clients to be structurally similar. **For instance**, clients in all three clusters reported that they experienced therapeutic techniques. (PSY/QUAN09)

(2) Also common in groups in the experimental condition was the practice of writing down found information in the Connection Log, and referring to it later. A group from an experimental period whose stakeholder position was adopted children, **for example**, looked in the Connection Log to refer to an absent student's research about issues faced by adopted children. (EDU/MM03)

(3) Greater difficulties arise in those cases where an individual has the linguistic competence to understand the utterance, but cannot hear it, for reasons of background noise or disturbance, **for example**, and those who can hear the utterance but cannot discern separate linguistic elements within it. (APL/QUAL09)

(4) Haka is a generic term used to describe all Maori dance (Karetu 1993: 24) and may be performed by both sexes in a variety of social situations, **such as** at funerals, at parties to welcome visitors, or prior to going to war. (APL/QUAL/09)

(5) Therapists who supported mandated reporting of animal abuse endorsed reasons **such as** having empathy for the suffering of sentient beings, seeing a link between animal abuse and human violence, and recognizing the potential for an offender receiving treatment. (PSY/QUAN16)

(6) Regarding perceived causes of their poverty, the participants who became rich occasionally attributed poverty to personal (**e.g.,** frequently quitting jobs) and sociocultural (**e.g.,** government corruption and high unemployment) factors. (PSY/QUAL18)

(7) Also, our approach to examining masculinity was based on the theoretical assumptions of the CMNI (**e.g.,** the primacy of work is viewed as masculine norm); (PSY/QUAN09)

5.1.2.3 Reformulators

As regards reformulators, the ANOVA did not find a significant main effect of discipline, $F\ (2,\ 171) = 0.696$, $p = .500$, $\eta_p^2 = .008$, but yielded a significant main effect of paradigm, $F\ (2,\ 171) = 11.954$, $p < .001$, $\eta_p^2 = .123$. The effect size showed

that paradigm accounted for 12.3% of the variance in the use of reformulators, approaching the criterion suggested by Cohen (1988) for a large effect (i.e., η_p^2 = .138). However, the ANOAV showed no significant interaction between discipline and paradigm, F (4, 171) = 0.865, p = .486, η_p^2 = .020. Post hoc comparisons showed that the quantitative RAs (M = 1.90, SD = 1.15) used markedly more reformulators than both the qualitative RAs (M = 0.97, SD = 0.88) (p < .001) and the mixed methods RAs (M = 1.23, SD = 1.16) (p = .003). The latter two groups, however, did not differ significantly from each other in the use of reformulators (p = .523). In terms of discipline, however, the applied linguistics (M = 1.34, SD = 1.10), education (M = 1.49, SD = 1.27), and psychology (M = 1.27, SD = 1.03) subcorpora used reformulators in similar frequencies.

The reformulators in this corpus were most typically realized by fixed grammatical structures such as *in other words*, *that is*, *namely*, *i.e.*, and *or*. More complex linguistic expressions, such as *put differently*, *to state this another way*, *which means that*, were sometimes used to rework the meaning of a previous discourse unit (cf. Hyland, 2007; Murillo, 2012, for similar findings). Except for the observed differences in relative frequencies, the paradigmatic and the disciplinary subcorpora used similar reformulators in realizing the two most common discourse functions: elaboration and delimitation. In elaboration, the second discourse units further elaborated or clarified the first discourse units. The reformulators were used to introduce definitions of terms (Examples 8 and 9) or explicate the meaning of preceding propositions (Examples 10 and 11).

(8) Reflective thinking (**i.e.,** the tendency to stop and think things over when confronted with difficulties), intrinsic motivation (**i.e.,** liking and enjoying

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teaching for its own sake), and control-expectancy beliefs (**i.e.**, the belief that one is generally able to support children's learning) were all related to increases in mastery goal orientation, suggesting a cumulative or enhancing cycle of interrelated adaptive beliefs. (EDU/QUAN10)

(9) Furthermore, as these researchers pointed out, the tasks used for examining the formula effect, **that is**, measuring the fluency and accuracy in an oral-dictation task and measuring reading times in a self-paced reading task might not be direct enough or the most appropriate for the formulaic effect to materialize. (APL/QUAN17)

(10) Moreover, implied by the correlations found in the study, the development of scientific reasoning and personal epistemology could be conceptualized as a two-way process. **In other words**, while personal epistemological beliefs mediate the performance of scientific reasoning, the mastery of scientific reasoning might in turn help advance personal epistemology. (EDU/QUAN06)

(11) In a related issue, the retrospective design of this study also could pose some limitations with regard to generalizability of the findings. **That is**, although semi-structured interviews allowed the researchers to gain an understanding of the participants' experiences with perceived racial microaggressions in supervision with a White supervisor, the supervisees' retrospective accounts of these microaggressive incidents may be faulty to some degree because they were asked to recall and describe events that occurred up to 2 years before the interviews were conducted. (PSY/QUAL04)

By contrast, in delimitation, the restatements in the second discourse units demarcated the scope of the propositions in the first discourse units. By using reformulators in this way, the writers could guide readers towards their intended meaning or preferred interpretation, as exemplified by the following examples.

(12) In the end, the finding of facilitation in the picture condition for the more proficient learners (and the lack thereof for the less proficient learners)

provides support for the CSM in the sense that more proficient language learners were able to select language at the conceptual level. The translation of the less proficient learners was not facilitated by the presence of pictures and, thus, did not show evidence of selecting language at the conceptual level. **In other words**, the data for the less proficient learners do not appear to support the CSM.   (APL/QUAN12)

(13) While a review of these two very distinct literatures is beyond the scope of this article, we note that educational conflict management and resolution literatures are aimed at ways to control conflict and differences that arise during collaboration (e.g., Hart, 1997; P. Short & Greer, 2001), while conflict theory advances the necessity of conflict (power struggles) for radical change. **In other words**, the two sets of literature are fundamentally different. (EDU/QUAL19)

(14) The propensity score matching analysis indicated that findings cannot be generalized across the whole population, given the different reading skills and family backgrounds of the participating children. Children with a low propensity score for likelihood of participation (the lowest quintile of the distribution) were underrepresented in the treatment group (see Table 3). **This means that** the results of the analyses of program effectiveness that follow cannot be generalized to students with low propensity scores, i.e., to students with the lowest achievement scores at pretest and with a less favorable family background than their peers. (EDU/QUAN/11)

(15) Our sample was also predominantly White and Native American, **which may mean** that our results are mostly applicable to these populations. (PSY/QUAL08)

In summary, the incidence of code glosses in the present study showed a clear division between the two subtypes, namely, exemplifiers and reformulators, across the disciplines and the paradigms. Regarding exemplifiers, the quantitative analyses revealed disciplinary differences in the psychology RAs versus the education and the applied linguistics RAs. The use of exemplifiers in this corpus typically served the

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discourse functions of instantiating general propositions, providing typical cases, and explaining abstract or technical notions. Regarding reformulators, the quantitative analyses showed a clear paradigmatic difference between the quantitative RAs on the one hand, and the qualitative and the mixed methods RAs on the other. The qualitative analysis found that the two most common discourse functions of reformulators in this corpus were elaboration and delimitation.

A comparison with some previous studies has indicated that the frequencies of exemplifiers and reformulators found in this study largely fell within a similar range of the soft disciplines such as sociology, business, and marketing (e.g., Hyland, 2007; Murillo, 2012). In addition, the present findings are consistent with those of Hyland (2007) in that all the examined social science disciplines tended to display a greater presence of exemplifiers over reformulators.

5.1.3 Transitional Markers

5.1.3.1 Transitional markers as a whole

The frequencies of transitional markers as a main type in the corpus varied markedly across the research paradigms but not across the disciplines. The ANOVA run on transitional markers as a group revealed a significant effect of paradigm, $F (2,171) = 10.803$, $p < .001$, $\eta_p^2 = .112$. However, there was no significant main effect of discipline, $F (2, 171) = 1.119$, $p = .329$, $\eta_p^2 = .013$. Neither was there a significant discipline/paradigm interaction, $F (4,171) = 0.626$, $p = .644$, $\eta_p^2 = .014$. Post hoc tests showed that the quantitative RAs ($M = 5.92$, $SD = 2.45$) used transitional markers significantly more frequently than both the qualitative RAs ($M = 4.28$, $SD = 1.79$) and the mixed methods RAs ($M = 4.74$, $SD = 1.61$) ($p = .001$, and $p = .004$ respectively). The latter two groups did not differ significantly from each other ($p = .625$). Among

the three disciplines, however, the applied linguistics (M = 5.25, SD = 2.00), education (M = 4.97, SD = 2.24), and psychology RAs (M = 4.71, SD = 2.03) did not differ significantly in the frequency of transitional markers.

In the present corpus, transitional markers were used primarily to express three types of semantic meanings: addition, comparison, and consequence. In what follows, I present both the quantitative and qualitative results for each of these subtypes of transitional markers.

5.1.3.2 Additive transitions

Regarding the subtype of additive transitions, the ANOVA results found neither a significant effect of discipline, F (2,171) = 1.679, p = .190, η_p^2 = .019, nor a significant effect of paradigm, F (2,171) = 1.237, p = .293, η_p^2 = .014. Furthermore, there was no significant interaction between the two, F (4,171) = 0.668, p = .615, η_p^2 = .015.

Additive transitions in the present corpus were typically realized by grammatical and lexical expressions such as *in addition*, *furthermore*, *moreover, additionally*, as well as the sentence-initial *and* and *also*. In terms of discourse functions, the additive transitions in my corpus did not appear to differ qualitatively across the research paradigms and the disciplines. Most typically, additive transitions were used to signal the relationship of addition between two discourse units where the information in the second unit paralleled that of a previous discourse unit in type or category. This pattern of usage is illustrated as follows.

(16) Results for the loss of AD diagnoses indicated that participants in all three active treatments were significantly more likely to remit than participants in the PBO condition (see Table 2). **Furthermore**, participants in the COMB condition were more likely to remit than participants in the SRT and CBT

conditions. SRT and CBT remission rates did not significantly differ from each other. (PSY/QUAN07)

(17) Further descriptive research is needed to examine the kinds of interactions that might either facilitate or impede the development of self-regulation in learners. **In addition**, more process-oriented research is needed to investigate the gradual shift from social regulation to increased self-regulation, as the student takes on the status of an equal partner in the learning process. (APL/QUAL14)

(18) In keeping with the expectations, teams with low prior math knowledge performed better when the teacher stimulated pupils' use of high quality helping behaviour. **Moreover**, these pupils also were more motivated to cooperate when they were encouraged to use high quality helping behaviour. (EDU/MM11)

5.1.3.3 Comparative transitions

As for comparative transitions, the ANOVA results yielded a significant main effect of discipline, F (2,171) = 4.761, p = .010, η_p^2 = .053, and a significant main effect of paradigm, F (2,171) = 5.941, p = .003, η_p^2 = .065. No significant paradigm/discipline interaction was found, F (4,171) = 0.452, p = .771, η_p^2 = .010. Post hoc test on discipline indicated that the applied linguistics RAs (M = 2.90, SD = 1.32) used comparative transitions significantly (p = .010) more frequently than the psychology RAs (M = 2.27, SD = 0.97) but did not differ significantly (p = 1.000) from the education RAs (M = 2.74, SD = 1.23). The latter two groups did not differ significantly from each other (p = .083). Post hoc tests on paradigm revealed that the quantitative RAs (M = 3.00, SD = 1.38) used comparative transitions significantly (p = .002) more frequently than the qualitative RAs (M = 2.27, SD = 1.07) but did not differ significantly (p = .274) from the mixed methods RAs (M = 2.64, SD= 1.03). The latter two groups did not differ significantly from each other either (p = .246).

The linguistic forms used for expressing comparative meanings were largely similar across the disciplines and the paradigms. The most common grammatical devices included *however*, *in contrast*, *similarly*, *on the contrary*, *on the other hand*, and the sentence-initial *but*. A closer analysis of the textual data indicated that the comparative transitions were used differently between the quantitative and the qualitative RAs. Although this type of transitional markers was frequently used in both subcorpora to mark relations of similarity and difference, the quantitative RAs used comparative transitions uniquely to contrast empirical results with initial expectations or hypotheses, as illustrated by Examples 19, 20, and 21:

(19) If the more years of experience and education of the high-and low-exposure groups contributed to their recall of English texts, then both the low-and high-exposure groups should have produced recalls vastly superior to the monolingual English group. **However**, this was not the case. (APL/QUAN10)

(20) We also expected the GD-tool to have positive effects on students' perceptions of their online communication and collaboration. This was not confirmed. **On the contrary**, students in the TD condition reported significantly higher levels of positive behavior. (EDU/QUAN08)

(21) Furthermore, spouses who expressed the most demands during either husbands' or wives' topics did not appear to exhibit less situational power during the discussion (power process), as would be hypothesized by the social structure hypothesis, **but** in fact exhibited the most domineering behavior and were most likely to be dominant during the discussions. (PSY/QUAN19)

Finally, despite the observed quantitative differences in comparative transitions between the applied linguistics and the psychology RAs, no obvious qualitative difference was found between the two subcorpora. As illustrated in the following examples, both the applied linguistics and the psychology RAs used comparative transitions to compare similar findings (Examples 22 and 23) and contrast

contradictory results (Examples 24 and 25) with previous studies.

(22) Transactional perspectives best depict the findings in recent research on the relation between changes in alcohol involvement and changes in marital quality (Kearns-Bodkin & Leonard, 2005) and changes in personality and changes in relationship satisfaction (Scollon & Diener, 2006). **Similarly**, the results of the current study highlight the reciprocal relation of changes in problematic alcohol involvement and changes in personality (i.e., impulsivity and neuroticism) but do not discern the temporal precedence of this association. (PSY/QUAN 30)

(23) Prior research on self-regulated learning emphasizes the importance of social support. The current study, **likewise**, found that learners' efforts to regulate their learning were enhanced greatly by the support of other Russian speakers. (APL/QUAL14)

(24) It is noteworthy that we did not detect significant differences in suicide ideation between U.S.-born and immigrant Asian American college students in our study. **In contrast**, a recent study by Duldulao et al. (2009) showed that U.S.-born Asian Americans reported higher levels of suicide ideation than immigrant Asian Americans. **However**, our study focused on college students' recent suicide ideation, whereas the former examined lifetime suicide ideation in a national community sample of Asian American adults. (PSY/MM18)

(25) Contradictory findings gleaned from these studies could be attributed to the way they operationalized proficiency. Taguchi (2008b) used the course level to operationalize proficiency and did not use standardized proficiency exams. … **In contrast**, the present study used TOEFL scores to distinguish proficiency levels, and the difference was large, more than 100 points apart between the low-and high-proficiency group (i.e., Group 1 and Group 2), which might have resulted in different processing speed. (APL/QUAN14)

5.1.3.4 Inferential transitions

The ANOVA on the inferential transitions yielded a non-significant main effect of discipline, F (2,171) = 2.209, p = .113, η_p^2 = .025, but a significant main effect of

paradigm, $F(2,171) = 11.657$, $p < .001$, $\eta_p^2 = .120$. There was no discipline/paradigm interaction, $F(4,171) = 1.084$, $p = .366$, $\eta_p^2 = .025$. Post hoc Bonferroni tests showed that the quantitative RAs ($M = 1.60$, $SD = 1.10$) used inferential transitions significantly more frequently than both the qualitative RAs ($M = 0.87$, $SD = 0.68$), and the mixed methods RAs ($M = 1.02$, $SD = 0.82$) ($p = .000$ and $p = .001$ respectively). The latter two groups did not differ significantly from each other ($p = .988$).

The use of inferential transitions in the present corpus was instantiated by such linking adverbials or connectors as *thus*, *therefore*, *consequently*, *hence*, *accordingly*, and *as a result*. While the qualitative analysis did not find any apparent difference in the use of inferential transitions across the disciplines, it did reveal a qualitative cross-paradigmatic difference in the use of inferential transitions. A prominent function of inferential transitions in the quantitative RAs was to signal causal relations in propositions. As shown in the following examples, inferential transitions were used jointly with causal language in the co-text (i.e., *driven by*, *associated with, attributed to*) to encode cause-effect relations in the knowledge claims or conclusions.

(26) ***As a result***, the moderate to large correlations among self-reported gains seem to be largely <u>driven by</u> errors in students' judgments. (EDU/QUAN03)

(27) **Thus**, hostile tendencies were <u>associated with</u> self-directed violence in women but not men, whereas anger was not associated with self-directed violence in either gender. (PSY/QUAN17)

(28) ***Consequently***, it is not possible to determine if, in cases where direct error correction together with written and/or oral meta-linguistic explanation are provided, the findings can be <u>attributed to </u>the effect of one or more of the feedback variables. (APL/QUAN15)

Although such co-occurrences of inferential transitions and causal language also occasionally appeared in the mixed methods RAs (Example 29), they were largely

absent from the qualitative RAs. Instead of establishing causal links between the variables, inferential transitions in the qualitative RAs were mostly used to signal that a current proposition was a logical consequence of a previous proposition or was derived from the author's inference (Examples 30 and 31).

(29) The frequency of concept elaboration was significantly and positively correlated with post-test Definitions Test scores, *r* (28) = .38, *p*< .05, but not linked to Questions Test performance, *r* (28) = .15, *ns*. **Thus**, the inclusion of even minor elaborations <u>supported </u>improved fact recall. (EDU/MM15)

(30) These students debated one another's ideas until the teacher ended the discussion by asking whether students had questions for the other groups. **As a result**, Larry and Tyler did not reconcile their differences. **Thus**, this was a teacher-aborted oppositional episode, as were the majority of the oppositional episodes that occurred during this debate (13 of 20). (EDU/QUAL03)

(31) As a member of the team explained, they had created the tasks first and then searched for a commercial textbook to complement those tasks. **Consequently**, it had been very difficult to integrate the book into the tasks. (APL/QUAL19)

To sum up, transitional markers in this corpus were found to mainly express three types of semantic meaning: addition, comparison, and inference. The quantitative analyses revealed that the most important cross-paradigmatic difference was the more frequent use of comparative and inferential transitions in the quantitative subcorpus, as compared with the qualitative subcorpus. The qualitative analyses indicated that the quantitative RAs were unique in using comparative transitions to compare empirical results with initial hypotheses, and in using inferential markers to express causation in presenting results or drawing conclusions. Another important finding across disciplines was that the applied linguistics subcorpus used more frequent comparative transitions than the psychology subcorpus.

In terms of overall normalized frequency, the incidence of transitional markers in this study is comparable to that for the non-science disciplines in Peacock's (2010) cross-disciplinary study on linking adverbials. Regarding the frequencies of specific subtypes of transitional markers among the individual disciplines, however, there are some discrepancy between the results of this study and those of Peacock (2010), which will be further discussed in Section 5.2.2. In comparison, Hyland (2005b, p. 143) reported much higher frequencies of transitional markers in soft disciplines such as applied linguistics (11.1 per thousand words) and marketing (13.8 per thousand words). This could be attributed to the fact that many intra-sentential transitions, such as *although*, *since, also*, were counted by Hyland (2005b), whereas they were excluded from metadiscourse by this study.

5.1.4 Frame Markers

5.1.4.1 Frame markers as a whole

The ANOVA run on frame markers as a main type yielded a non-significant main effect of discipline, F (2, 171) = 1.852, p = .160, η_p^2 = .021, but a significant main effect of paradigm, F (2, 171) = 7.642, p = .001, η_p^2 = .082. There was no significant paradigm/discipline interaction, F (4, 171) = 0.458, p = .766, η_p^2 = .011. Post hoc tests revealed that the quantitative RAs (M = 2.87, SD = 1.89) used frame markers significantly more frequently than the qualitative RAs (M = 1.82, SD = 1.35) and the mixed methods RAs (M = 2.09, SD = 1.28) (p = .001 and p = .016 respectively). The qualitative and the mixed methods RAs did not differ significantly from each other (p = 1.000). In terms of discipline, the applied linguistics (M = 2.31, SD = 1.55), education (M = 2.50, SD = 1.76), and psychology (M = 1.97, SD = 1.41) subcorpora did not differ from each other significantly.

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Frame markers in the present corpus included a range of metadiscursive resources used for various purposes in discourse organization, such as arranging information into sequences (*sequencers*), introducing new topics (*topicalisers*), signaling the stage of unfolding discourse (*stage-labels*), and announcing discourse goals (*announcers*). In the following subsections, I present the quantitative and qualitative results for the relevant subtypes of frame markers.

5.1.4.2 Sequencers

Sequencers accounted for the overwhelming majority of the frame markers identified in this corpus. The ANOVA run on sequencers yielded a significant main effect of paradigm, F (2, 171) = 5.481, p = .005, η_p^2 = .060. There was neither a significant main effect of discipline, F (2, 171) = 1.860, p = .159, η_p^2 = .021, nor a significant discipline/paradigm interaction, F (4, 171) = 0.486, p = .746, η_p^2 = .011. Post hoc tests indicated that the quantitative RAs (M = 1.86, SD = 1.53) used sequencers significantly more frequently than the qualitative RAs (M = 1.18, SD = 1.04) and the mixed methods RAs (M = 1.27, SD = 1.01) (p = .008, p = .027, respectively). The latter two groups of RAs did not differ significantly from each other (p = 1.000).

Sequencers found in the corpus were mainly realized by listing devices such as *first*, *second*, *third*, and *finally*. Despite the observed differences in relative frequencies, the qualitative analysis of the use of sequencers suggested that this type of metadiscourse was used similarly across the paradigms, for example, to list research results. The enumeration function of sequencers was most typically associated with an introductory phrase (Hempel & Degand, 2008), which was comprised of a quantifier and a classifier, such as *a few features* (Example 32) and *a*

number of communicative goals (Example 33).

(32) <u>A few features</u> of Figure 2 are worth noting. **First**, there was a general improvement in the district average over the 5 years of the study, relative to state results. **Second**, the GR schools, which started out well below the district average, appeared to surpass the comparison schools and even the district average by the end of the 5 years. **Finally**, no impact of the GR intervention appeared during the first 2 years (Phase 1), but an impact did appear in the subsequent 3 years (Phase 2). (EDU/QUAN14)

(33) Carl's story accomplishes <u>a number of communicative goals</u>. **First** he provides Nerissa with the information she has requested concerning the content of the course: (a) we talk about what we are doing in our internship (lines 5–6), (b) we discuss misunderstandings (lines 8–14). **Second**, Carl demonstrates to Nerissa that he is aware of the potential for cross-cultural misunderstanding when people from different cultures communicate (lines 8, 10, 12, 14). (APL/QUAL17)

Another prototypical discourse function of sequencers was to list research limitations:

(34) However, several limitations should be considered. **First**, CBASP is an integrative treatment…. it is conceivable that the results would differ for treatments that focus more narrowly on social problem solving. **Second**, treatment was limited to 16–20 sessions over 12 weeks. …. **Third**,…This may have adversely influenced some patients' motivation to fully engage with CBASP and SA, attenuating its effects on social problem solving. **Fourth**,…It is possible that the effects of social problem solving on depressive symptoms unfold over much shorter or longer intervals, reducing the sensitivity of our analyses. **Fifth**, we used a self-report inventory to assess social problem solving. … might conceivably yield different results. **Finally**, …hence, they may not be entirely representative of chronically depressed patients treated in community settings. (PSY/QUAN08)

No disciplinary differences in the discourse functions of sequencers were observed in this corpus. As can be seen from the following examples, across disciplines, sequencers were similarly used to organize findings or results (Examples 35 and 36), and list the steps in arguments (Example 37).

(35) With regard to RQ1, two main findings resulted from the correlational analysis. **First**, taking into account the entire sample of learners, all parts of the instrument were correlated strongly, … **Second**,…. (APL/QUAN11)

(36) Several interesting results are illustrated in this knowledge decomposition analysis. **First**, it is clear that some learning takes place at the knowledge component level (Figs. 7, 9). **Furthermore**, such an analysis helps pinpoint which components of problem solving are affected by the intervention. (EDU/QUAN17)

(37) We are confident, however, that there are several reasons why this is unlikely to be the case. **First**, it has been suggested that different measurement formats of the Five Factor Model (e.g., adjectives vs. full statements) are basically equivalent (John, 1990). **Second**, this particular Five Factor Model measure has been used successfully in other MIDUS research (e.g., Plant, Markus, & Lachman, 2002; Staudinger, Fleeson, & Baltes, 1999). **Third**, neuroticism as a structurally and etiologically coherent structure was clearly revealed in phenotypic and genetic factor analyses using the same base twin sample as the one used in the current study (Johnson & Krueger, 2004). (PSY/QUAN11)

5.1.4.3 Topicalisers

Due to their relative low frequencies in the corpus, I did not perform statistical analyses on the use of topicalisers, stage-labels, and announcers. The linguistic expressions which were typically used as topicalisers in this corpus included such phrases as *in terms of*, *with respect to*, *with regard to*, *regarding*, *now*, and *turning to.* A common discourse function of these expressions was to signal the starting of a new topic. For example, when reporting results, topicalisers were commonly used to

organize a number of results into different strands:

(38) **In terms of** perceptions of work demands and resources, men reported more negative client behaviors, F (1, 578) = 30.25, $p<$ .001,…**In terms of** direct client contact, both solo and group practitioners actually spent more time conducting therapy each week than agency respondents. (PSY/QUAN15)

(39) **With respect to** the given listening lesson, both of them stated that their motivation was recognition of their lack of L2 listening ability. (APL/QUAL18)

It was also found in the present corpus that the RA writers occasionally used topicalisers was to explicitly announce a shift to another topic:

(40) We **now** consider both of the classroom episodes with respect to the three features we have highlighted. (APL/QUAN07)

(41) We **turn now to** the practice of school mathematics (as instantiated in one particular geometry classroom in this high school). (EDU/QUAL11)

(42) Next, we **turned to** the qualitative data to explore whether there were variations by race in mothers' differentiation among their children that were not apparent from the quantitative analyses. (PSY/MM08)

The analysis did not find any obvious or cross-disciplinary cross-paradigmatic difference in the discourse functions of the use of topicalisers.

5.1.4.4 Stage-labels

Stage-labels were another subtype of frame markers which the RA writers used to mark the staging of the discourse, typically the summary or conclusion. This subtype of frame markers was most commonly realized by expressions such as *in sum*, *overall*, *in summary*, *in conclusion*, *in short*, *taken together*, *thus far*, and *so far*. These expressions were most typically used to sum up the results or findings presented earlier:

(43) **In sum**, regarding our third hypothesis, the results provide further empirical evidence for the benefits of raising learners' metacognitive awareness by guiding students through the process of listening. (APL/MM17)

(44) **In sum**, these results are in line with Hypothesis 1 that coercive teacher behaviour would be negatively associated to a teacher's interpersonal proximity in class. (EDU/QUAN09)

(45) **In short**, learning to consider oneself as a therapeutic project, always in the making, was an important outcome that staff attempted to orchestrate for clients within the counseling program. (PSY/QUAL06)

Alternatively, stage-labels were used to recapitulate what had been discussed until the point of speaking in a particular section:

(46) **Thus far**, in the Results section for career decision making, themes of barriers and lack of access to employment have been described. (PSY/QUAL08)

(47) Finally, the MRC-MAC data presented **so far** indicate that, although not all participants tended to overestimate their comprehension in Test 2, those who did (again, the majority of cases)generally did so by a much larger margin. (APL/QUAN20)

(48) **Overall**, our results provide important insights into the effectiveness of the newly developed Parent-child reading program, indicating that its conceptual framework (guided reading aloud and implicit strategy instruction in social interaction between parent and child) is a promising basis for designing training programs that can be successfully and effectively implemented within the family context and can promote the development of important prerequisites for reading literacy. (EDU/QUAN11)

In terms of the discourse functions of stage-labels, no pronounced cross-disciplinary or cross-paradigmatic differences were detected in the corpus data.

5.1.4.5 Announcers

In the present corpus, announcers were expressed in various linguistic forms, such as *in this section*, *we discuss/describe/ report*, *will*, *my goal/focus/purpose, aim to*. The most common discourse function of announcers was to help the RA writers to frame the presentation of information in the discourse and highlight the discourse objectives.

(49) **This section** addresses the second part of the research design, which focused on investigating, from learners' own perspectives, the role of the class group in individual learners' L2 motivation. (APL/MM05)

(50) This discussion **will** be organized around the questions noted at the end of the introductory section, namely, Will CM be as effective as PM? (EDU/QUAN02)

(51) **In this section**, **we describe** the 10 types of immediacy that emerged from the qualitative analysis of the 33 immediacy events (each event could involve more than one type of immediacy). (PSY/MM06)

Although no quantitative analyses were conducted on the use of announcers, a mere look at the relative frequencies (Table 5.1) indicated that the applied linguistics and the education subcorpora used more announcers than the psychology subcorpus.

In summary, the quantitative analyses of frame markers revealed that the quantitative RAs used sequencers significantly more frequently than the other two paradigmatic subcorpora. The qualitative analyses indicated that the discourse functions of frame markers include ordering discourse, introducing or shifting topics, marking discourse development stages, and announcing discourse goals. While the above examples illustrated the functions of each individual subtype, the textual analyses revealed that these metadiscoursal devices often worked jointly to frame the propositional content and structure the texts. The finding that frame markers,

particularly sequencers, occurred frequently in RAs is consistent with Hempel and Degand's (2008) finding that sequencers are frequently used in academic writing.

5.1.5 Endophoric Markers

5.1.5.1 Endophoric markers as a whole

Endophoric markers make references to the text itself and orient readers towards specific information. Two subtypes of endophoric markers can be distinguished as linear and non-linear references. Whereas linear references refer to the text or a part of it, non-linear references usually direct readers to visual information in the text.

The ANOVA run on endophoric markers found a significant main effect of discipline, F (2, 171) = 10.776, p = .001, η_p^2 = .112. Similarly, a significant effect of paradigm was found, F (2, 171) = 3.307, p = .039, η_p^2 = .037. There was no significant interaction between paradigm and discipline, F (4, 171) = 1.780, p = .135, η_p^2 = .040. Post hoc tests showed that the both the applied linguistics RAs (M = 3.20, SD = 2.05) and the education RAs (M = 3.02, SD =1.87) used significantly more frequently endophoric markers (p = .001 and p = .001 respectively) than the psychology RAs (M = 1.79, SD =1.59). The former two groups, however, did not differ from each other (p = 1.000). Further, post hoc tests revealed that the quantitative RAs (M = 3.04, SD = 1.38), used endophoric markers significantly (p = .037) more frequently than the qualitative RAs (M = 2.21, SD = 2.44), but showed no difference from the mixed methods RAs (M = 2.76, SD = 1.78) (p = 1.000). No significant difference between the latter two subcorpora was found (p = .289). In what follows, I present both quantitative and qualitative analyses of the use of the two subtypes of endophoric markers in the corpus.

5.1.5.2 Linear references

The ANOVA run on linear references yielded a significant main effect of discipline, F (2, 171) = 17.740, p = .000, η_p^2 =.172, but a non-significant main effect of paradigm, F (2, 171) = 0.370, p =.691, η_p^2 =.004. There was no significant interaction between discipline and paradigm, F (4, 171) = 0.821, p =.513, η_p^2 =.019. Post hoc tests showed that the applied linguistics RAs (M = 1.13, SD = 0.93) used significantly more linear references than both the education RAs (M = 0.77, SD = 0.65) and the psychology RAs (M = 0.38, SD = 0.38) (p = .013 and $p < .001$ respectively). Moreover, the education RAs used significantly more linear references than the psychology RAs (p = .008).

Linear references, sometimes known as "locational metatext" (Dahl, 2004, p.1812), use various linguistic forms to refer to the text itself or part of the text. In the present corpus, linear references were mainly realized by a range of expressions about the specific locations in the text, for example, *below*, *in the next section*, *in what follows*, *later*, *as mentioned above*, *as noted earlier*, *in the previous section*, *in this article*, *here*, and *this paper*. A qualitative analysis of linear references in the current corpus indicated three major discourse functions: preview, review, and overview. In the post-method RA sections, linear references were frequently used to preview or anticipate the upcoming presentation of information, as illustrated by the following examples:

(52) **In this section**, the location of turn boundary and its effect on the quality of interpreting will be discussed. (APL/QUAL05)

(53) **In the next section**, we report on the interpretations of these representations by participants and the artists themselves. The relative sophistication of

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students' solution representations is taken up **in a later section**. (EDU/MM12)

(54) **Below**, we describe the general, typical, and variant categories that appeared within each domain, and also offer discussion of emergent themes. (PSY/QUAL17)

The RA writers often had to connect their findings and discussion in the post-method sections with earlier information. Thus, apart from previews, linear references were also frequently used to review what had been presented or discussed before.

(55) **As described in the literature review**, most earlier research on narratives has considered their value for teaching prosody or particular grammatical structures, or for providing practice in developing conversational fluency. (APL/QUAL17)

(56) **As noted earlier**, working for social change with diverse groups can create tension as various members' interests often collide (Grossberg, 1996; hooks, 1996). (EDU/QUAL01)

(57) The internal consistency estimates obtained for the instruments in the current sample were similar to those obtained in comparable samples and reported **in the previous section**. (PSY/QUAN06)

Another common discourse function for linear reference was to overview the entire RAs or sections, in other words, to summarize or to draw conclusions based on the previous discussion.

(58) **In this paper** we have raised questions in relation to understandings of 'language' and 'heritage'. (APL/QUAL06)

(59) **This article** has brought a micro-interactional perspective to bear on a perennial problem in school reform policy and research.(EDU/QUAN08)

(60) A systematic quantitative and qualitative analysis of therapy interactions and complementarity, such as the one presented **here**, could play a role in training of group therapists and in informing treatment models. (PSY/MM16)

5.1.5.3 Non-linear references

The ANOVA run on non-linear references yielded both a significant main effect of discipline, F (2, 171) = 4.875, p = .009, η_p^2 = .054, and a significant main effect of paradigm, F (2, 171) = 5.471, p = .005, η_p^2 = .060. Moreover, there was also a significant interaction between paradigm and discipline, F (4, 171) = 2.501, p = .044, η_p^2 = .055. As can be seen from Table 5.1, the interaction occurred mainly because of the markedly greater variations in the qualitative and the mixed methods RAs across the three disciplines, when compared with those of the quantitative RAs. Post hoc tests showed that the education RAs (M = 2.25, SD = 1.67) used significantly more non-linear references (p = .010) than the psychology RAs (M = 1.41, SD = 1.51), but did not differ (p =1.000) from the applied linguistics RAs (M = 2.07, SD = 1.61). The latter two groups did not differ from each other (p= .065). Post hoc tests revealed that the quantitative RAs (M = 2.35, SD = 1.08) used non-linear references significantly frequently (p =.004) than the qualitative RAs (M = 1.42, SD = 2.13), but did not differ from the mixed methods RAs (M = 1.96, SD = 1.40) (p= .529). The latter two groups did not differ from each other (p = .165).

In the present corpus, non-linear references typically involved visual displays, such as tables and figures, or supplementary materials of RAs, such as examples, excerpts, appendices, footnotes. A close qualitative examination revealed that while non-linear references were found in all the subcorpora, a notable cross-disciplinary difference was observed between the education and the applied linguistics RAs on the one hand, and the psychology RAs on the other. Specifically, the psychology RAs preferred such non-linear references as *tables* and *figures*, which accounted for over 90% of the total non-linear references in the psychology subcorpus (see Examples 61

and 62). Other, infrequent non-linear references included *appendix*, *flowchart*, *footnote*, *equation*, *example*, *quote*, and *passage*. In comparison, the education and the applied linguistics RAs appeared to have used a wider range of non-linear references. Apart from *tables* and *figure*, which were also frequently used, these two subcorpora of RAs also frequently employed non-linear references such as *episode*, *example*, *excerpt*, and *extract*. Other infrequent non-linear references in the education and the applied linguistics subcorpora included *appendix*, *chart*, *comment*, *exchange*, *footnote*, *instance*, *protocol*, *transcript*, *turn*, *quote*, and *vignette*. The variety of non-linear references in the two subcorpora reflected the diverse forms of verbal data or evidence in these two disciplines. It should be noted that although the education and the applied linguistics RAs used *figure* and *table* similarly frequently for data presentation, the non-linear references to episodes and extracts appeared to be unique to these two disciplines (Examples 63 and 64).

(61) Descriptive statistics for the sample are presented in **Table 3** stratified by 5-HTTLPR allele status. (PSY/QUAN02)

(62) We developed a model of ideal advisors for international graduate students based on the grounded theory findings (see **Figure 2**). (PSY/MM11)

(63) **In this episode**, we describe how the facilitators supported teachers' idea progression through hypothesis generation, a challenging task for the participating teachers. (EDU/QUAL20)

(64) However, **the next extract** shows a distinctive difference from **Extract 1**. This is a different group of police officer, interpreter, and suspect from the one in **Extract 1**, although both extracts are from the Melbourne case. (APL/QUAL05)

Apart from the observed qualitative difference in the use of non-linear references across the disciplines, there were also apparent qualitative differences in the use of non-linear references between the quantitative and the qualitative RAs in terms of

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choices of specific non-linear references. As shown in the following examples, authors of quantitative RAs preferred to make references to tables (Example 65) and/or figures (Example 66) when presenting statistical results or patterns:

(65) **Table 4** shows the betas associated (e.g., cluster loadings) with the common factor category for each cluster as well as the test for differences between the cluster loadings for each common factor category. **The last column in Table 4** shows the relative contribution of the item (R^2) associated with each common factor category. (PSY/QUAN09)

(66) For example, we grouped all participants who had 95% coverage on either the Climate or the Mice text and then calculated the mean total comprehension scores for that text. The two texts were analyzed separately, as learners usually had different coverage percentages on the different texts. The results are illustrated in **Table 2 and Figure 4**. (APL/QUAN19)

In comparison, although authors of qualitative RAs also frequently referred to visual representations in their texts, their repertoires of such representations were more diversified, including not only tables and figures, but also *excerpts* (Example 67), *episodes* (Example 68), *transcripts*, *vignettes* (Example 69), and *quotes* (Example 70). In addition, a survey of the corpus revealed that while most of the tables in the quantitative RAs included numerical information, such as descriptive and inferential statistics, those in the qualitative RAs presented mostly verbal information, such as examples and summaries of thematic data (Example 71). Such differences suggested that visual displays in the quantitative RAs were likely to represent abstract relationships, whereas those in the qualitative RAs tended to showcase concrete data.

(67) **Excerpt 6** shows that Tomoko was positive overall about working with Nami in her diary and interview. (APL/QUAL18)

(68) In general, the dynamics in Group 1 tended to be less active than the dynamics in Group 2, as shown in **Episode 1**, in which the facilitator made great efforts to engage Group 1. (EDU/QUAL20)

(69) In **the following transcript**, the team is practicing for an upcoming game. As it is an important game in their season, practice is even more intense than usual. **The following vignette** occurs about 45 min into the practice, and players are using one half of the court to practice their defensive play, where they switch covering particular offensive players as the other team moves on the court.(EDU/QUAL11)

(70) For most participants, work was a means to earn money to live, and this was exemplified **in the following quotes**:… (PSY/QUAL07)

(71) Thematic categories that differed in frequency between the satisfied groups and the unsatisfied groups were organized into therapist factors, client factors, and relationship factors (see **Table 3**). (PSY/QUAL03)

To sum up, the overall use of endophoric markers appeared to be influenced by both disciplinary and paradigmatic factors. Across the disciplines, the education and the applied linguistics RAs used more linear references in previewing, reviewing, or overviewing the texts, as compared with the psychology RAs. At the same time, the education subcorpus used obviously more non-linear references than the psychology subcorpus. In terms of choices of specific non-linear references, the education and the applied linguistics subcorpora used more varied non-linear references in presenting data types and findings, as compared with the psychology subcorpus. Across the paradigms, the quantitative RAs used more non-linear references, particularly tables and figures, than the qualitative RAs. In terms of overall frequency, the incidence of endophoric markers in this study is comparable to their occurrences in the disciplines of applied linguistics and marketing in Hyland (2005b). Further, the use of linear endophorics across disciplines is similar to Dahl's (2004) study, where the linguistics

and the economics RAs used much more "locational metatext" than the medical RAs. Finally, although the applied linguistics and education RAs employed a wider range of non-linear endophorics, the predominance of tables and graphs in psychology corroborated the tendency to quantify in this particular social science discipline (Smith, et al., 2002).

5.1.6 Evidential Markers

5.1.6.1 Evidential markers as a whole

Evidential markers function to attribute information to intertextual sources. Based on whether the cited source appears as a syntactic element in the citing sentence, evidential markers can be distinguished into integral citations and non-integral citations (Swales, 1990). Rhetorically, integral citations tend to foreground the cited sources by weaving them into the text, whereas non-integral citations background the cited sources by placing them within the parentheses.

The ANOVA results on evidential markers as a group revealed neither a significant effect of discipline, F (2, 171) = 0.829, p = .438, η_p^2 = .010, nor a significant effect of paradigm, F (2, 171) = 2.209, p = .113, η_p^2 = .025. The discipline/paradigm interaction was also non-significant, F (4, 171) = 0.625, p = .645, η_p^2 = .014.

While the quantitative analyses on the overall use of evidential markers did not reveal any differences across the three disciplines or the three research paradigms, the results of further analysis of the two subtypes of evidential markers are presented as follows.

5.1.6.2 Integral citations

The ANOVA run on the subtype of integral citations revealed a significant main

effect of discipline, F (2, 171) = 10.349, p = .000, η_p^2 = .108, but a non-significant effect of paradigm, F (2, 171) = 0.215, p = .807, η_p^2 = .003. There was no significant interaction between paradigm and discipline, F (4, 171) = 0.240, p = .915, η_p^2 = .006. Post hoc tests found that the applied linguistics RAs (M = 1.81, SD = 1.60) employed integral citations significantly more frequently than both the education RAs (M = 0.96, SD = 0.95) and the psychology RAs (M = 0.90, SD = 0.95) (p = .001 and p < .001 respectively). The latter two did not show any difference in the use of integral citations (p = 1.000).

According to the grammatical role of a cited author in the citing clause, integral citations can be further distinguished into three types: "verb-controlling", "naming", and "non-citation" (Thompson & Tribble 2001, pp. 95-96). In verb-controlling citations, the cited author controls the cited information by a lexical verb (Example 72); in naming a citation, the cited author occurs in a noun phrase (Example 73). A non-citation makes reference to a cited author without providing a specific date (Example 74). The results of qualitative analyses indicated that naming and verb-controlling citations were most frequently used integral citations across the three disciplines, whereas non-citations only occurred occasionally. While no obvious paradigmatic difference was manifest in the use of different types of integral citations, a clear cross-disciplinary tendency was that the applied linguistics RAs used more naming as well as verb-controlling citations, as compared with the other two subcorpora.

(72) Second, and perhaps more importantly, **Bormann (1985)** contended that not all members of a group share the same cultural fantasies. (APL/QUAL03)

(73) Our findings differ from those of **Tracey et al.'s (2003)** study in several ways. (PSY/QUAN09)

(74) **Barron's** study suggests that team success is best predicted by joint attention to the task at hand and a supportive climate for different ideas. (EDU/MM11)

Apart from the more frequent use of naming and verb-controlling citations, another tendency identified in the data analysis was that the applied linguistics RAs used more integral citations with direct quotations (around 13% of the total integral citations in applied linguistics), as compared with those from the education and the psychology subcorpora (approximately 6% and 5% respectively of the total integral citations in the subcorpora). As the following examples illustrate, the quoted information was either inserted in its entirety into the current discourse or was fused with the syntactic structures of the current discourse. Either way, the quoted voices tended to be foregrounded.

(75) In an insightful reflection on human identity, **Taylor (1989)** wrote, "<u>Our identity is what allows us to define what is important to us and what is not</u>" (p. 30). (APL/QUAL01)

(76) In 1992, **Phillipson** presented some of the issues surrounding the "<u>native speaker fallacy</u>", that is, the belief that "the ideal teacher is a native speaker" (p. 185). (APL/QUAN11)

In comparison, although such uses of integral citations were not absent from the education and the psychology RAs, they were much less typical. Instead, when citing from other sources, the writers from these two disciplines were more likely to use integral citations with paraphrased or summarized information from the intertextual sources, as exemplified below.

(77) Previous studies have reported mixed effects of representational guidance on students' post-test performance. **Van Drie et al. (2005)** found differences on

post-test performance between different representations, while **Suthers and Hundhausen (2003)** did not. (EDU/QUAN08)

(78) For example, **DeCaro and Worthman's (2007)** study of preschool children in a southern American city, based on parent diaries and interviews, found that scheduling time for stimulating activities while protecting the child from too much busyness was an important concern expressed by parents. (PSY/MM03)

5.1.6.3 Non-integral citations

As regards non-integral citations, the ANOVA yielded a significant main effect of discipline, F (2, 171) = 5.714, p = .004, η_p^2 = .063, but a non-significant main effect of paradigm, F (2, 171) = 2.733, p = .068, η_p^2 = .031. There was no significant interaction between discipline and paradigm, F (4, 171) = 1.365, p = .248, η_p^2 = .031. Post hoc comparisons showed that, contrary to the observed patterns of integral citations, the applied linguistics RAs (M = 2.34, SD = 1.92) used non-integral citations significantly less frequently (p = .003) than the psychology RAs (M = 3.49, SD = 1.82). No difference was found between the applied linguistics RAs and the education RAs (M = 2.87, SD = 1.90) in the use of non-integral citations (p =.353). Neither was there any difference between the education and the psychology RAs in this regard (p =.218).

The use of non-integral citations, according to Thompson and Tribble (2001, p.95), can be distinguished into four types according to their functions of: "source", "identification", "reference", and "origin". Source citations attribute the cited information to intertextual sources external to the current text (Example 79). Identification citations identify the agent of the attributed information (Example 80). Reference citations refer to further information provided by other intertextual sources.

While Thompson and Tribble (2001) pointed out that this type of non-integral citation is often used in tandem with the directive *see*, my corpus data showed that the expressions *cf.* (0.05 per thousand words) and *e.g.* (0.36 per thousand words) were also frequently associated with non-intergral citations (Example 81). All cases of *cf.* and over one third of *e.g.* in the corpus co-occurred with non-integral citations. Finally, origin citations indicate the originator of a concept or a product (Example 82).

(79) Such findings support many researchers' belief that more attention needs to be paid to the influence of learner groups on language learning (**Dörnyei & Malderez, 1999; Dörnyei & Murphey, 2003; Ehrman & Dornyei, 1998; Hadfield, 1992**). (APL/MM05)

(80) It has been found that trainees, regardless of their racial background, who engage in culturally responsive cross-cultural supervision report feeling supported and an increased sensitivity to cultural issues in therapy (**Burkard et al., 2006**). (PSY/QUAL04)

(81) Because the treatment group and the control group are considered as two different populations, we specified a sequence of regression models with and without control variables rather than repeated measures analysis of variance (cf. **Campbell & Kenny, 1999; Maxwell & Delaney, 2004; Plewis, 1985**; for a critical discussion of the ANCOVA approach see **Miller & Chapman, 2001**) (EDU/QUAN11)

(82) There are several points to notice in this transcript. The first is that the conversation between the teacher and students follows a typical Initiation, Response, Evaluation (IRE) format (**Cazden, 1988**) and is centered on recalling the steps of various mathematical procedures that produce the equation of a line. (EDU/QUAL11)

The textual analyses showed that while origin and identification citations occurred very infrequently (accounting together for less than 10% of the total non-integral citations in the corpora) in the corpus, source and reference (accounting together for over 80% of the total non-integral citations) citations were relatively

frequently used in all three disciplines. Although no apparent cross-paradigmatic differences were noted in the use of non-integral citations, in terms of the discipline, the psychology RAs, in comparison with those from applied linguistics, seemed more inclined to use these types of non-integral citations to compare results with other studies (Example 83) or support an argument or claim (Example 84) (such use accounted for approximately 76% of the total non-integral citations in psychology versus 71% in applied linguistics), and to make reference to the literature in the disciplinary fields (Example 85) (approximately 17% of the total non-citations in psychology versus 11% in applied linguistics).

(83) Moreover, many studies have documented competitive employment rates in this population of 15% or less (**Rosenheck et al., 2006; Salkever et al., 2007**) compared to the 35% monthly competitive employment rate for IPS in the last 18 months of this study. (PSY/QUAN03)

(84) In particular, these studies suggest that ethnic minority families rely on extended family to promote successful outcomes for their families in the face of both social and economic hardships (**Harrison, Wilson, Pine, Chan, & Buriel, 1990; Hunter & Taylor, 1998; Wilson, 1986**). (PSY/MM18)

(85) Indeed, our sample included patients taking only second-generation antipsychotics—without taking anticholinergic medication known to affect cognition in SZ (see **Woodward, Purdon, Meltzer, & Zald, 2005**, for a meta-analysis)—and with a recent onset of the illness (see **Braw et al., 2008**). (PSY/QUAN04)

In summary, the quantitative analyses showed that the use of integral citations and non-integral citations differed across the disciplines but no cross-paradigmatic differences were identified. The three disciplines also differed in their preferences for integral versus non-integral citations. Whereas the applied linguistics RAs used more integral citations to foreground the agents and voices of the cited sources, the

psychology RAs were more likely to use non-integral citations to support their arguments. The finding of a relatively high frequency of integral citations in applied linguistics is consistent with previous studies such as Hyland (1999) and Hu and Wang (2014). As the latter study indicated, integral citations were about five times as frequent in applied linguistics RAs as in medical RAs (Hu & Wang, 2014). The higher frequency of non-integral citations found in the psychology versus the applied linguistics RAs is more comparable to Hyland's (1999) study, where hard disciplines such as biology and physics tended to prefer non-integral citations over integral citations. In addition, Hu and Wang (2014) similarly reported a less frequent use of non-integral citations in applied linguistics as compared with that of medicine.

5.2 Discussion

5.2.1 Summary of the findings

As reported above, the quantitative analyses revealed clear cross-disciplinary and cross-paradigmatic variations in the use of different main types and subtypes of interactive metadiscourse. All the significant comparisons across disciplines and paradigms are summarized in Table 5.2.

Table 5.2

Summary of Statistically Significant Comparisons in the Use of Interactive Metadiscourse across the Disciplines and the Paradigms

	Cross-disciplinary difference	Cross-paradigmatic difference	Discipline/ paradigm interaction
Code glosses	No	No	No
Exemplifiers	PSY> EDU PSY> APL	No	No
Reformulators	No	QUAN>QUAL QUAN>MM	No
Transitional markers	No	QUAN>QUAL QUAN> MM	No
Additive	No	No	No
Comparative	APL>PSY	QUAN>QUAL	No
Inferential	No	QUAN>QUAL QUAN>MM	No
Frame markers	No	QUAN>QUAL QUAN>MM	No
Sequencers	No	QUAN>QUAL QUAN>MM	No
Topicalizers	---	---	---
Discourse-labels	---	---	---
Announcers	---	---	---
Endophoric markers	APL>PSY; EDU>PSY	QUAN>QUAL	No
Linear	APL>EDU>PSY	---	---
Non-linear	EDU>PSY	QUAN>QUAL	YES
Evidential markers	No	No	No
Integral	APL>EDU; APL>PSY	No	No
Non-integral	PSY>APL	No	No

Across the disciplines, as shown in Table 5.2, there was a general contrast between the applied linguistics RAs and the psychology RAs in the use of interactive metadiscourse. On one hand, the psychology RAs used significantly more exemplifiers and non-integral citations than the applied linguistics RAs; on the other hand, the applied linguistics RAs used significantly more comparative transitions, linear references, and integral citations than the psychology RAs. A similar contrast, though to a lesser extent, existed between the psychology and the education

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subcorpora where the psychology RAs used significantly more exemplifiers but fewer linear and non-linear references than the education RAs. Moreover, the education RAs also differed from the applied linguistics RAs by using fewer linear references and integral citations. These patterns can be illustrated in Figure 5.1.
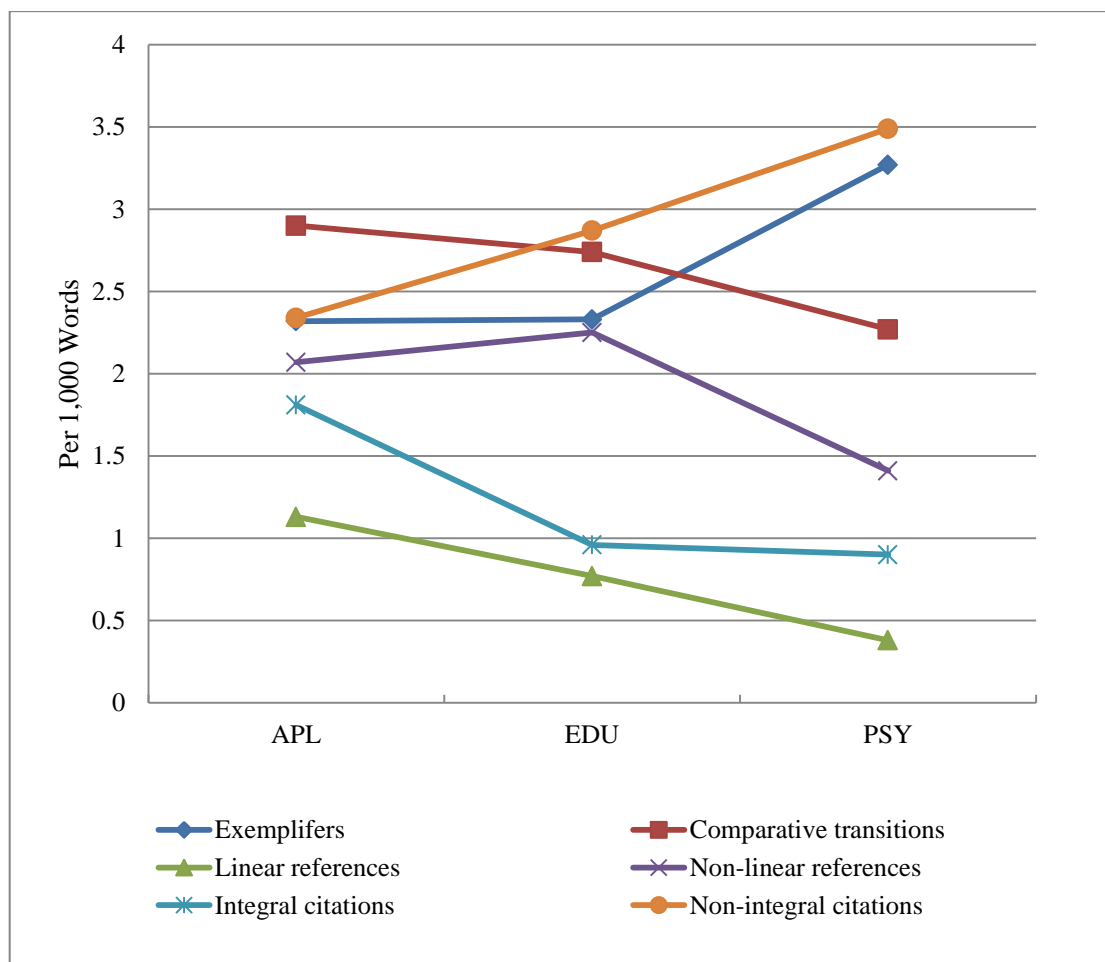
Figure 5.1 Mean frequencies of statistically significant comparisons in the use of interactive metadiscourse across the disciplines

As can be seen from Table 5.2, the most prominent patterns of cross-paradigmatic differences existed between the quantitative subcorpus on one hand and the qualitative and the mixed method subcorpora on the other. Except for evidential markers, other main types or subtypes of interactive metadiscourse exhibited clear and consistent

cross-paradigmatic variations between the quantitative and the qualitative RAs, and to a lesser extent, between the quantitative and the mixed method RAs. These quantitative patterns of use can be illustrated by Figure 5.2.
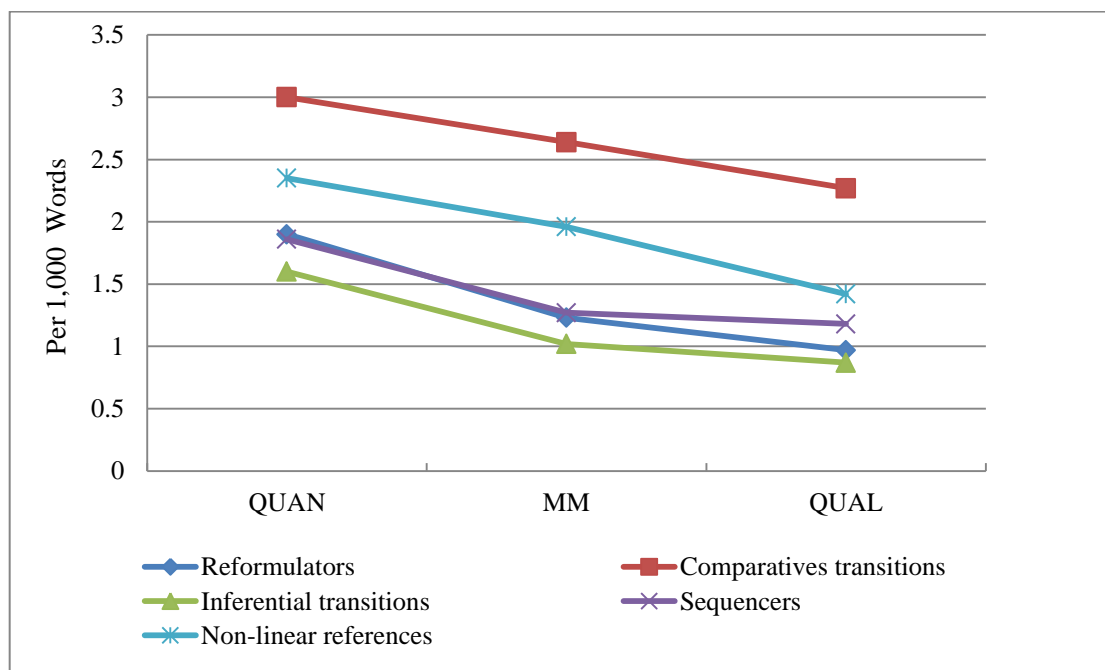
Figure 5.2 Mean frequencies of statistically significant comparisons in the use of interactive metadiscourse across the paradigms

5.2.2 Disciplinary influences on the use of interactive metadiscourse

As reported in this chapter, this study has found some clear cross-disciplinary differences in the use of several types of interactive metadiscursive resources, namely, exemplifiers, comparative transitions, linear and non-linear references, integral citations and non-integral citations. As can be seen from Table 5.2, these cross-disciplinary differences existed mainly between the applied linguistics and the education RAs on one hand and the psychology RAs on the other. These variations in the use of interactive metadiscourse, I would argue, could be plausibly explained in terms of the knowledge-knower structure prevailing in each of the disciplines under

examination and their preferred "languages of legitimation" (Maton, 2000, p.147; see also Maton, 2007, 2010a, 2010b, 2014).

As mentioned earlier in Section 3.1 of Chapter 3, in his analysis of the forms of knowledge in different intellectual fields, Bernstein (1999) characterized disciplinary knowledge by the underlying structuring principles, making a distinction between hierarchical and horizontal knowledge structures. Hierarchical knowledge structures, which are characteristic of natural sciences, aim to create highly general propositions and theories by integrating knowledge at lower levels across a diverse range of phenomena. In contrast, horizontal knowledge structures, which are typical of the humanities, "consist of a series of specialised languages with specialised modes of interrogation and criteria" (1999, p.162), and governed by "non-comparable principles of description based on different, often opposed, assumptions" (1999, p.163). Extending Bernstein's work, Maton (2000, 2007, 2010a, 2010b, 2014) argues that for every knowledge structure, there should also be a knower structure. Similar to knowledge structures, knower structures can also be classified as hierarchical or horizontal according to the varying strengths of social relations between knowers and knowledge. Hierarchical knower structures are systemically organized on the basis of the construction of an ideal knower and develop by integrating new knowers at lower levels of the structure and across a broad range of knower dispositions (Maton, 2000, 2007, 2010a, 2010b, 2014). Within hierarchical knower structures, knowledge claims by RA authors (i.e., knowers) are predicated on their voice, namely, their "subjective or intersubjective attributes and personal experiences" (Maton, 2000, p.157). On the other hand, horizontal knower structures can be represented as a range of strongly bounded segments of knowers and each with his/her own personal attributes or

dispositions (Maton, 2000, 2010a, 2010b, 2014). In horizontal knower structures, which are characteristic of the natural sciences, the validity of knowledge claims by different knowers depends on scientific procedures and criteria that are independent of personal attributes. For the practical purpose of this study, hierarchical knowledge-horizontal knower structures, which dominate the natural sciences, and horizontal knowledge-hierarchical knower structures, which prevail in the humanities, can be seen as constituting the two ends of a continuum of codes of specialization characterized, respectively, as the knowledge and knower codes (Maton, 2007, 2010a, 2010b, 2014). Although all three disciplines examined in this study are social sciences and occupy the middle ground of the continuum (Wignell, 2007), psychology is most knowledge-oriented (Harper, 2008; Madigan et al, 1995), while applied linguistics most knower-oriented (Moed, 2005; Hood, 2011). Their relative positions are illustrated by Figure 5.3.
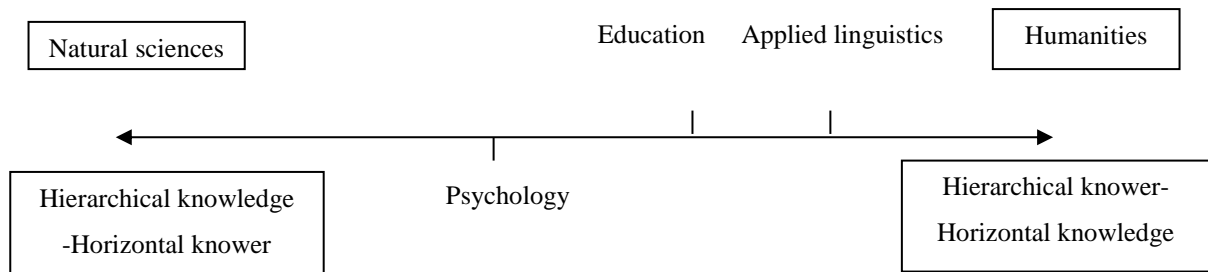
Figure 5.3 The relative positions of the three disciplines on the continuum of knowledge-knower structures

Viewed from the perspective of knowledge-knower structures, the more frequent use of exemplifiers by the psychology RAs, as compared with the education and the applied linguistics RAs, can be interpreted in terms of the knowledge-dominated

structure in psychology. Given its stronger knowledge orientation and a more hierarchical knowledge structure, knowledge in psychology is likely to be at a higher level of abstraction or generality as a result of an ingrained disciplinary predisposition to integrate a wide range of different empirical phenomena at lower levels into more general theoretical propositions (Bernstein, 1999). Because of their generality or abstractness, the meaning, relevance and/or applications of such theoretical propositions may not be immediately transparent and can cause comprehension problems. The use of exemplifiers (e.g., *such as*, *for example*, *for instance*) can alleviate such problems by illustrating abstract constructs or general propositions through examples, as illustrated by Examples 1, 6, and 7 in Section 5.1.2.2. Furthermore, as Hyland (2007) observes, exemplification in the knowledge-oriented disciplines can "carry considerable empirical authority," and "tying examples to the writer's data" can "reinforce the reader's acceptance of the evidential weight of the interpretation" (p.281). In this regard, although most of my specialist informants made no comments, one informant from psychology, PSY2, explained how specificity was valued both by not only herself but also her reviewers in the discipline.

> [I want] just to be a bit specific with regard to the point I'm trying to make. I think that's always something that I value. Just to be as specific instead of saying something that is very kind of general. And then some were actually suggestions from reviewers. It's like 'oh, you know it will be interesting to look at this in the context such as this', so that's when I incorporate, just take that in as well. (PSY2/QUAN)

In comparison, education and applied linguistics are more knower-oriented fields (Hood, 2010, 2011) where horizontal knowledge-hierarchical knower structures dominate. Knowledge in these two disciplines may be more elaborate and

context-dependent rather than as generalizable and abstract as that of psychology. Consequently, it may be less necessary to elaborate their knowledge claims by using exemplifiers.

On the other hand, a more horizontal knowledge structure combined with a more hierarchical knower structure that prevailed in applied linguistics could readily account for its more frequent use of comparative transitions than psychology. As Bernstein (1999) observes, the "defence of and challenge of other languages" is "intrinsic to a horizontal knowledge structure" (p.163). Thus, knower code-oriented disciplines are constantly in the process of "proliferation and fragmentation" which "emphasizes *difference from* rather than *similarity with* [each other]" (Maton, 2010a, p.54). Consistent with this tendency, the majority of comparative transitions in the present corpus expressed contrastive relations (e.g., *however*, *but*) which could be used to emphasize the knower's distinct language or voice, align or dis-align readers with alternative positions (Hood, 2010), and create knowledge claims in the knower code. In contrast, in more knowledge-oriented fields such as psychology, the dominating hierarchical knowledge structures aim to integrate specific knowledge claims at a local level into more general theoretical propositions at a higher level. Therefore, the consistency in theoretical principles and generality of knowledge construction may be partially reflected by the less frequent use of comparative transitions for expressing difference.

The lower frequencies of comparative transitions in the psychology RAs than the applied linguistics RAs in the present study appear to be contradictory to the findings of Peacock's (2010) study, in which the psychology RAs were found to have used more contrastive linking adverbials, although not significantly, than those of

linguistics RAs. One possible reason for such differences could be attributed to the fact that the two studies followed different methods in identifying target features. While Peacock (2010) focused on a limited range of contrastive linking adverbials, this study adopted an open-ended category. Thus, such features as sentence-initial *but*, *conversely*, *on the contrary*, *on the flip side*, *regardless*, *yet* were included in this study but excluded from Peacock's investigation. This may partly explain the discrepancy in the results. Another possibility is that this study sampled an equal number of RAs from all the three research paradigms, which might be different from the sample composition of RAs in Peacock's study, which gave no information about research paradigms. An equal sample of RAs from different paradigms may represent a discipline differently from a non-stratified sample of RAs. Thirdly, where Peacock examined entire RAs, the present study only investigated the post-method sections. Possibly, other sections of the RAs may display different proportions of target features, which might differ from the results based on the post-method sections alone. While these differences in methodology and analysis could explain the discrepancies between our findings, it is clear that more research is necessary with regard to the use of comparative transitions across these two disciplines.

By the same token, the stronger knower orientations of applied linguistics and education provide a plausible explanation for the more frequent use of linear and non-linear references in the applied linguistics and the education RAs than in the psychology RAs. As pointed out by Maton (2007, 2010a), knowers' personal attributes or dispositions, in particular, their own voices, are given much emphasis in horizontal knowledge-hierarchical knower structures. In other words, there is greater knower visibility (Hood, 2011) in a more knower-oriented discipline. Although they

do not make direct references to authors (knowers), the use of endophorics, especially linear references, (e.g., *as described in the literature review* in Example 55; *in this paper* in Example 58) imply the authors' status as knowers. Thus, the more frequent use of such references in applied linguistics and education would cohere well with the stronger emphasis on the "social relation" (Maton, 2000, p.154) between knowledge and its author in these more knower-oriented disciplines than in the more knowledge-oriented discipline of psychology. Alternatively, the need for linear references may also have been intensified by the less codified and more purpose-specific textual structures of applied linguistics and education which could increase the necessity for the author-knower to orient and guide the reader through the knowledge constructing process. By contrast, psychology has a well codified and highly institutionalized format for research reporting (Bazerman, 1988; Madigan et al., 1995), and consequently "no extra processing effort is needed by the expert reader to orient him- or herself within the text" (Dhal, 2004, p.1819). This would reduce the need for psychology authors to make orienting references to their texts.

The interview data indicated that my specialist informants from all three disciplines identified the need for connection and readability in discourse as the most prominent motivation for using interactive metadiscourse such as transitions and linear endophoric markers in their texts. Regarding the use of transitions, for example, one of my psychology informants, PSY2, commented on the necessity of transitional markers in the discussion section of her paper:

> It's for the section to flow better. I mean because they are all about limitation, so if I take them out, it's just you know the flow may not be as good .... (PSY2/QUAN)

Another psychology informant, PSY1, however, seems to hold a somewhat

different viewpoint. When asked if some transitional markers in her text were necessary, she believed that such devices could be omitted. In other words, disciplinary readers who are familiar with the content and perhaps the discursive practices of psychology may not need such "link" to make connections between ideas.

> For me, it's really about readability and flow. So in terms of content, yes, it could be omitted. I wanna link, I wanna to help the readers to link the information. But you know, some readers may not need, certainly do not necessarily need that link. So I don't think it is critical (PSY1/QUAL)

In terms of the use of linear endophoric markers, almost all my specialist informants agreed that such devices can help readers to establish links or connection between different parts of the text, the writers from applied linguistics and education appeared to be more acutely aware of such needs. For example, one educational informant, EDU2, justified the use of a particular linear endophoric marker in her text as providing a link for her readers:

> So to have certain links related to validity issues, I say 'as mentioned before'. Otherwise, people may feel surprised. Why you mention something here? (EDU2/QUAN)

In a similar vein, the importance of connection and links was reiterated by other informants. While it may well be argued that their views simply represented common knowledge of academic writing, to some extent such views may also reflect the discursive conventions and practices in their disciplines.

> I can say that when I think about writing of this kind [research articles], what I most interested in ensuring is the flow and connection that one point leads to another. (EDU1/QUAL)

Because here I'm going to discuss item 4 so I say that it follows because I need to link this part to the earlier part. So I say that. And here, item 4 is one of the items on my list. But I'm not going to discuss 4 because I had discussed it earlier. So I'm trying to signal that I'm saying 'I'll be discussing each item one by one, but I will not discuss item 4'. (APL2/QUAN)

This [the article] was based on a later revision cause I was told to shorten the whole procedure part. So the initial writing was much more like A B C and D, kind of goes on step one two three. There was a lot of explanation. Here I attempted to shorten the whole thing I just started the sentence saying 'okay they've already completed the questionnaires and they've done the practice', and in order to prevent people from wondering where this is coming from, I just say 'okay, go see below'. I don't think it's something I use very commonly. It's just that here it seems appropriate. (PSY2/QUAN)

As can be from the above excerpts, EDU1 and APL2 stressed the importance for creating links between different points of argument or sections of paper, while PSY2 pointed to the need to signposting for readers. It is worth noting that PSY2 acknowledged that using such linear endophorics may not be a common practice for her. This is perhaps because many quantitative RAs, and even qualitative RAs in psychology tend to follow a relatively fixed textual structure (e.g., IMRD) so that readers may hold certain expectations for what can be found in different sections. Thus making links or connections may be redundant for some disciplinary readers. This seems to contrast with the viewpoint of another informant from applied linguistics, APL1, who argued for the importance of linear endophorics by comparing writing in his discipline to "weaving":

I believe that if you write anything longer than a couple of pages, you should think of your writing as weaving, you should, weaving a piece of cloth. You

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are not writing a telephone book. What you are trying to do is you are weaving a piece of cloth where you have a warp thread and you have a weft thread. …So one of the ways in which you weave things together is you make connections between different parts, … they are basically ways in which we transition from one section to another. (APL1/QUAL)

In short, although my special informants from all three disciplines recognized the importance of linking and connection in the flow of their writing, it appeared that those from applied linguistics were more concerned with making connections by using such metadiscursive devices.

Next, the visibility of knowers in applied linguistics can be metadiscursively enhanced not only by comparative transitions and linear endophoric markers as discussed above, but also through the use of integral citations (see Table 5.2). By integrating the name of a cited author (i.e., a knower) syntactically into the citing sentence, integral citations help to "establish a professional persona" (Hyland, 1999, p.359) and foreground individual interpretations, alternative perspectives, and human agency in knowledge construction. The attitudes and dispositions of knowers can also be made to appear more prominent by the co-occurrence of the integral citations and direct quotations, which occurred markedly more frequently in the applied linguistics RAs than in the psychology RAs. In comparison, the degree of knower visibility was much reduced in psychology RAs due to the more frequent use of non-integral citations, coupled with the fewer occurrences of direct quotations. As noted earlier, psychology is characterized by a more hierarchical knowledge structure and a more horizontal knower structure, as compared with applied linguistics. Thus the citing conventions in psychology are likely to be closer to those of the natural sciences,

where hierarchical knowledge structures prevail. In a more knowledge code-oriented field, it is plausible to give more prominence to what is projected rather than the source of projection (Hood, 2011). Therefore, the more frequent use of non-integral citations in the psychology RAs reflects this discipline's greater emphasis on knowledge instead of knowers. The greater incidence of integral citations in the applied linguistics RAs in the study corroborated the findings from other cross-disciplinary studies (e.g., Hyland, 1999, Hu & Wang, 2014) where applied linguistics used more integral citations but fewer non-integral citations as compared with disciplines like physics or medicine. While my informants from both applied linguistics and psychology agreed that their decisions on integral or non-integral citations vary in accordance with the relevance and focus of the citations, one of my psychology informants stressed that the overuse of direct quotation had been disapproved in her discipline.

> It's frowned upon actually. You can do a little bit of quoting in a paper. But if you did too much quoting, reviewers will ask you to come back and they would not accept that. (PSY1/QUAL)

Finally, the findings that the education RAs aligned with the psychology RAs in the use of integral citations, but resembled the applied linguistics RAs in the use of exemplifiers, and to a lesser extent in the use of linear references, indicate its somewhat middle-ground status. Although education, similar to applied linguistics, can be broadly characterized as a more knower code-oriented field, the inclusion of education journals related to teaching and learning sciences subjects in my corpus may have contributed to a mixture of knowledge and knower codes in the discipline under investigation. As a consequence, it is plausible that the education RAs shared a

tendency in the use of exemplifiers and linear references with the applied linguistics RAs, whereas they displayed more affinity with the psychology RAs in the employment of integral citations.

5.2.3 Paradigmatic influences on the use of interactive metadiscourse

As reported in Section 5.2.1, the most prominent cross-paradigmatic difference was between the quantitative and the qualitative RAs in the use of reformulators, comparative and inferential transitions, sequencers, and non-linear references, where the quantitative subcorpus used all these interactive resources more frequently than the qualitative subcorpus. In addition, the study also found that all the above-noted interactive resources, except for comparative transitions and non-linear references, were markedly more frequent in the quantitative RAs than in the mixed methods RAs. (see Table 5.2)

These differences appear to be consistent with the distinct epistemologies and knowledge-making practices that prevail in different research paradigms, respectively. As noted earlier in Section 3.2, quantitative research has been dominated by a (post)positivist epistemology that holds a deterministic view of human behavior and the social world and seeks to uncover generalizable laws of cause and effect (Cohen et al. 2011; Johnson & Christensen, 2012; Russo, 2008), whereas qualitative research is underpinned by a constructivist-interpretivist epistemology that prioritizes participant meanings and aims to develop contextualized understandings of "personal, cultural, and historical experiences" (Creswell, 2009, p.8). Such paradigmatic differences were also well perceived by some of my specialist informants. A qualitative researcher, EDU1, for example, related the differences between the quantitative and qualitative

paradigms to the differences in notions of knowledge and worldviews:

> I think that research is about the generation or creation of knowledge. So it's natural that we would have differences or different stances around the nature and origins of knowledge. And those differences shape our worldview in terms of knowledge-making… So I think that quantitative researchers begin with some ideas that they then move to test. It's not that the qualitative researchers don't…. It's not possible for human beings to be passive slates. But the purpose of qualitative research is to also allow yourself to be surprised and for findings to emerge…. I think there are multiple differences that begin with the notions of knowledge for sure. (EDU1/QUAL)

In a similar vein, another specialist informant, APL1, offered his account of the differences between cognitive research and socioculturalist research in applied linguistics:

> When they, cognitive folks, look at social stuff, they are working with a particular framework which is related to logical positivism.… And what you do with the positivism is you put forward hypothesis, and you try to test that hypothesis, and the field develops as a result of failing the hypothesis, not to be confirmed, is being falsified and so therefore, it affects your theory. So this is the way of going ahead…. You work with socioculturalism you don't work with that same way, because you don't think it is going to be a theory which affects everybody. You can't have a theory of language use or language learning which will be so embracing that it will affect anybody with the brain. What we want to do is that we want to try to understand the process for individuals and try to understand the in-depth of the process. (APL1/QUAL)

As the above two long quotes indicated, both of the specialist informants have recognized that quantitative and qualitative research were concerned with different epistemologies and knowledge-making practices. For EDU1, it is the "different stances" towards "the nature and origins of knowledge" that shape the

knowledge-making practices in quantitative and qualitative paradigms, for examples, hypothesis-testing versus emergent findings. As to APL1, the differences between so-called "cognitive folks" and "socioculturalism" in fact reflect differences between positivism and constructivism that underlie the quantitative and qualitative research paradigms. While the former produced knowledge by developing and testing hypothesis-testing, the latter sought to understand "the in-depth of the process". Given such contrasting assumptions regarding epistemologies, the quantitative and qualitative research paradigms differ in fundamental ways with respect to issues like causation, linearity, and generality.

First, from a (post)positivist perspective, causation or causality can be determined in part by establishing logical relationships among propositions and variables (Cohen et al., 2011). In other words, the form causation takes in quantitative research is "reductionist", "directional", and "linear" (McGrath & Johnson, 2003).

In this regard, establishing causation between/among variables abstracted from the research contexts can be facilitated by logical relationships between propositions. Comparative and inferential transitions are important logical markers or metadiscursive signposts of reasoning that serve the useful functions of sorting out similarities, identifying differences, comparing empirical results with theoretically derived hypotheses, and establishing causal links between propositions and variables, as illustrated by examples (Examples 19-21 and 26-27) presented in Sections 5.1.3.3 and Section 5.1.3.4. By contrast, qualitative research is often informed by the relativist view that "there exist multiple, socially constructed realities, ungoverned by natural laws, causal or otherwise" (Guba & Lincoln, 1989, p.86). In addition, qualitative research aims to produce "qualitative/subjective description, empathetic

understanding, and exploration" of human thoughts, behaviors, and experiences as "situational, social, contextual, personal, and unpredictable" (Johnson & Christensen, 2012, p.34). As a result, causation or cause-effect relations may not be as important for the qualitative paradigm as it is for the quantitative paradigm. Where causation does play a part in qualitative research, it is stressed that causation should be understood as a dynamic process involving human intentions and other interplaying factors over time, rather than as a static and single event (Cohen et al., 2011). As a result, there would be fewer opportunities in qualitative research to compare/contrast observed results with a priori expectations or to establish causal generalizations based on a few variables. Such differences in views of causation may explain the fewer comparative and inferential transitions in the qualitative RAs than in their quantitative counterparts.

In a similar vein, the more frequent use of reformulators in the quantitative RAs can also be explained in terms of the pursuit of immutable, universal cause-effect laws by quantitative research (Guba, 1990). Such a pursuit can often give rise to highly abstract, technical knowledge that requires elaboration to facilitate comprehension and utilization, as demonstrated by Examples 8, 9, and 10. Furthermore, because empirical findings from quantitative research are expected to contribute to a technical knowledge base that enables accurate prediction and control of objectified processes (Habermas, 1971), quantitative researchers are required to spell out their knowledge claims for the formulation of precise hypotheses to be further tested or to delimit the scope of their generalizations for possible applications, as illustrated by Examples 12 and 14. Qualitative research, by contrast, aims to inductively develop "a pattern of meaning" (Creswell, 2009, p.8) that often admits of multiple interpretations and

results in personal, holistic, subjectively meaningful, and contingent knowledge claims (Cohen et al., 2011). Such knowledge claims serve the heuristic functions of contributing to practical understanding and exploration (Habermas, 1971; Johnson & Christensen, 2012). Compared with knowledge claims generated in quantitative research, there appears to be less need for qualitative knowledge claims to be elaborated or delimited precisely. Thus, the more frequent use of reformulators in the quantitative RAs was consistent with the greater importance that quantitative research attaches to precision and specification of knowledge claims and their scope of generalization.

Third, apart from explicating logical relationships between propositions, as well as reworking knowledge claims for precision and specificity, quantitative research typically establishes causality through determining statistical links between hypothesized causes and effects (Cohen, et al., 2011; Russo, 2008). In order to establish statistical links between perceived causes and outcomes, quantitative research is often compelled to take a reductionistic approach and focus on the relationships between a limited number of selected variables each time. As pointed out by Creswell (2009, p.7), quantitative research is "reductionistic in that the intent is to reduce the ideas into a small, discrete set of ideas to test, such as the variables that comprise hypotheses and research questions". Such hypotheses and research questions lead to discrete empirical results/findings/qualifications that can be easily ordered and presented in linear sequences (Madigan et al., 1995), as illustrated by Examples 32 and 34. Such a high degree of discreteness and itemization in quantitative RAs was also reflected by the theme of linearity attested by my specialist informants from quantitative paradigm. For example:

> I like to organize like that, I like it to be clear because, you know, I want my readers to read my paper and not give up. If I'm not very clear, even if it's not a difficult subject, if it's not clear, I've lost my audience. (APL2/QUAN)

> I think the use of 'first, second' is quiet common if you have a number of points you want to explain, yes, quite straightforward. (EDU2/QUAN)

By contrast, qualitative research looks for the complexity of social realities rather than abstracting them through numerical measurement and statistical models or narrowing them into a small set of discrete categories (Creswell, 2009). Thus, qualitative findings do not lend themselves easily to atomization or itemization and are typically presented in an "organic, non-linear and holistic" manner (Cohen et al., 2011, p.28). The cross-paradigmatic difference found in the use of sequencers in our corpus coheres well with the differing nature of empirical results/findings yielded by quantitative and qualitative research.

Furthermore , by employing predetermined and structured instruments of data collection for precise measurement (Johnson & Christensen, 2012), quantitative research reduces human behaviors, attitudes, performances, demographics, and other attributes to numerical information and mathematically modeled relationships (Cohen et al., 2011; Creswell, 2009). Such numerical data and statistical relationships are usually presented in tables and graphs in the post-method sections of quantitative RAs that are often referred to repeatedly in the presentation and discussion of empirical results. Such "inscription devices" (Latour & Woolgar, 1986, p.51) are so pervasive in quantitative RAs that Smith, Best, Stubbs, Archibald, and Roberson-Nay (2002) characterize graphism as "a hallmark of science" (p.754) and the use of numerical tables as an index of "the quantitativeness of scientific fields" (p.756). The extensive

use of tables and figures in quantitative paradigm was recognized by several of my specialist informants.

> …in the report itself a quantitative research study will have lots of tables and figures so statistical data will have to be presented, they have to be commented on; that's mainly the driver of the quantitative research approach in terms of writing a report. (APL2/QUAN)

> Usually, when we present interaction we need figures. But if it is just a [statistical] result, we use tables. (EDU2/QUAN)

> If it's an empirical study where you have participants, it's important to know the demographic features, typically people have some kind of table….it all depends on what are the findings, like some findings it's just easier to present visually, like you are looking at how something changes over time, like a graph like this. It conveys a point in a very clear way. (PSY2/QUAN)

As can be seen from the above extracts, visual displays such as tables and figures are commonly employed in quantitative research to report statistical findings or demographic information about participants or to illustrate interaction or changes in trends.

Qualitative research, on the other hand, generally recognizes "the immense complexity of human nature and the elusive and intangible quality of social phenomena" (Cohen et al., 2011, p.7), emphasizes understanding as the leading objective of research, and views knowledge as socially constructed in specific contexts. Therefore, it tends to focus on the verbal representation of socially constructed realities through in-depth analysis of language and meaning (e.g., *excerpts*, *episodes*, *transcripts*, *vignettes*, and *quotes*), as was revealed by the textual analyses of the qualitative RAs (see Examples 67 to 70). In addition, both my qualitative

informants from applied linguistics and education pointed out that other than tables and figures, graphics such as illustrations and drawing were increasingly used by them as visuals in qualitative research.

I think illustrations, not tables and figures like these, but illustrations can be of great use in qualitative research. (APL1/QUAN)

One thing that I have become more fond of is the idea of graphics that are not your typical [examples]. So they are not tables, they are not charts, and they are not bar graphs. They are actual artifacts from data. So, for instance, there was a chapter, quite one of my favorite pieces, that was published actually in 2002 and it was about how to kind of trace the trajectory of the preservice teachers, how they move from personal knowledge to professional knowledge. And I used a variety of data sources, including some drawings that students did where they traced their own trajectory through art. So in talking about those data I had screenshots, you know, and I like to do that. (EDU1/QUAL)

These differences in knowledge-making practices between quantitative and qualitative research could in part account for the markedly more frequent use in the quantitative RAs of the non-linear references which, as illustrated by Examples 65 and 66, were predominantly statistical tables and figures.

In addition to the distinct cross-paradigmatic differences between the quantitative and the qualitative RAs in the use of the interactive resources as noted above, consistent differences were also observed between the quantitative and the mixed methods RAs in the deployment of interactive metadiscursive resources such as reformulators, inferential transitions, and sequencers (see Table 5.2 for a summary). A review of previous literature suggests that the issue of writing up mixed methods has not been well addressed and there has been an apparent lack of agreement on the structure and style of mixed methods research reports (Hesse-Biber, 2010; Leech,

2012). For example, based on a summary of extant literature on reporting mixed method research, Leech (2012) proposed that a mixed methods research report can be written and organized in different ways, including the standard APA format and various non-traditional approaches. Since mixed methods research combines elements from both quantitative and qualitative research, Calfee and Sperling (2010) proposed to conceptualize mixed methods research as a dialogue and conversation between "different methods, standpoints, and ways of knowing" (p.42). A writer of mixed methods research is inclined to draw on multiple rhetorical conventions of research and engages in dialogue between those conventions (Calfee & Sperling, 2010). While mixed methods research typically takes a midway position between the other two paradigms, which form the two ends of a continuum (Teddlie & Tashakkori, 2009), specific mixed methods studies may vary in their leaning toward either quantitative or qualitative research (Morgan, 2014). Thus, although discursive features of both quantitative research and qualitative research may be reflected in a mixed methods research report, given the constraints in publication, writers of mixed methods RAs may prioritize either the quantitative or qualitative components depending on a given journal's preference (Hesse-Biber, 2010). It is possible that the mixed methods RAs in the present corpus were more predisposed to the qualitative research paradigm, as opposed to the quantitative paradigm. This would account for the findings that mixed methods RAs differed mostly from the quantitative RAs but not from the qualitative ones in the use of metadiscourse.

5.3 Summary

This chapter presented the corpus-based results on the use of interactive metadiscourse in the post-method sections of RAs across the disciplines and

paradigms. Across disciplines, a broad contrast was found between applied linguistics and psychology, with the former using markedly more comparative transitions, linear references, and integral citations, and the latter employing more exemplifiers and non-integral citations. Education appeared to take a middle ground, showing both alignments with and deviation from applied linguistics and psychology in the use of interactive metadiscourse such as exemplifiers, linear and nonlinear references, and integral citations. Such disciplinary differences have been explained by the different knowledge-knower structures dominating in each of the disciplines under examination. In addition, accounts from disciplinary insiders have also been used to supplement the interpretations.

Moreover, this chapter has presented cross-paradigmatic differences in the use of various subtypes of metadiscourse. Across the paradigms, differences were found to exist between the quantitative and qualitative paradigms. A range of interactive metadiscourse features, namely, reformulators, comparative and inferential transitions, sequencers, and non-linear references, were clearly more frequent in the quantitative than the qualitative RAs. In addition, the quantitative RAs also used reformulators, inferential transitions, as well as sequencers more frequently than the mixed methods RAs. Such cross-paradigmatic differences have been primarily accounted for by the contrasting epistemological assumptions regarding causality, linearity, and generality between the quantitative and the qualitative research paradigms. Interview data from specialist informants were also drawn on to support such explanations.

CHAPTER VI
FINDINGS AND DISCUSSION:
INTERACTIONAL METADISCOURSE

This chapter presents and discusses the empirical results concerning the use of interactional metadiscourse across the three disciplines and the three research paradigms. The primary function of interactional metadiscourse is to signal writer's stance and to engage with readers. The major metadiscursive resources used for expressing writer stance include hedges, boosters, attitude markers, and self-mentions. The main metadiscursive resources used to engage targeted readers in texts include directives, reader references, questions, knowledge appeals, and personal asides. In this chapter, I first present the results of both quantitative and qualitative analyses of each main type and subtype of interactional metadiscourse. Then I discuss cross-disciplinary and cross-paradigmatic variations in the use of interactional metadiscourse in relation to the different knowledge-knower structures prevailing in the disciplines and the epistemological stances of the different paradigms. Insider accounts from the interview data will be drawn on to substantiate discussion where it is relevant.

6.1 Findings

6.1.1 Overview of interactional metadiscourse in the corpus

Table 6.1 provides a summary of the descriptive statistics of each main type of interactional metadiscourse and the relevant subtypes of engagement markers by discipline and paradigm. In terms of frequencies per 1,000 words, hedges were the most frequently used main type of interactional metadiscourse in the present study,

accounting for an overwhelming majority of interactional metadiscoursal resources. The relative frequencies of boosters, attitude markers, and self-mentions, and engagement markers were more or less similar in the corpus. Among the five subtypes of engagement markers, directives and reader references were used relatively more frequently. The frequencies of questions, knowledge appeals, as well as personal asides were extremely low in the corpus.

Table 6.1

Means and Standard Deviations of Interactional Metadiscourse by Discipline and Paradigm[7]

Types and subtypes	Applied Linguistics						Education						Psychology					
	QUAN		QUAL		MM		QUAN		QUAL		MM		QUAN		QUAL		MM	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Hedges	12.05	4.39	6.62	3.13	8.60	4.03	11.51	4.36	5.69	2.20	10.11	4.06	11.12	4.84	7.13	2.87	9.39	3.13
Boosters	3.58	1.54	2.36	1.07	3.47	1.60	4.22	1.97	2.05	0.97	3.21	1.56	1.95	1.25	1.13	0.62	2.43	1.85
Attitude markers	2.15	1.23	1.75	1.10	1.90	1.23	2.11	1.26	1.22	0.95	1.72	0.66	1.86	1.04	1.76	0.85	1.90	0.79
Self-mentions	2.96	3.33	2.38	2.11	2.96	2.84	3.30	2.86	3.73	3.06	5.04	3.56	5.44	3.42	3.24	2.68	4.91	5.37
Engagement markers	2.38	1.91	2.51	1.66	2.55	1.84	2.87	1.78	2.24	1.67	1.84	1.38	2.72	1.81	1.38	1.15	1.47	1.04
Directives	0.94	0.88	0.96	0.72	1.24	0.97	1.92	1.46	1.00	1.00	0.95	0.70	2.24	1.71	0.64	0.53	0.85	0.85
Reader references	1.09	1.10	0.92	1.20	0.82	0.90	0.55	0.52	0.77	0.68	0.64	0.94	0.30	0.36	0.43	0.45	0.22	0.27
Questions	0.23	0.34	0.31	0.48	0.36	0.59	0.27	0.61	0.40	0.70	0.17	0.29	0.09	0.17	0.16	0.35	0.06	0.16
Knowledge appeals	0.07	0.22	0.07	0.14	0.02	0.11	0.04	0.11	0.02	0.10	0.02	0.05	0.00	0.00	0.00	0.00	0.03	0.08
Personal asides	0.05	0.14	0.25	0.60	0.11	0.18	0.09	0.19	0.04	0.07	0.06	0.14	0.09	0.20	0.15	0.25	0.31	0.40
Total	23.11	7.97	15.62	4.35	19.48	7.54	24.01	5.98	14.93	5.70	21.91	7.78	23.09	6.38	14.64	4.54	20.09	7.59

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[7] See Table 6.9 on p.264 for statistically significant results of comparsions across disciplines and paradigms.

6.1.2 Hedges

Hedges are the most frequently used main type of interactional metadiscourse in this study. Quantitative analyses were performed on hedges to determine cross-disciplinary as well as cross-paradigmatic differences, if any. Qualitative analyses were also conducted to identify the discourse functions of hedges in the post-method RA sections.

The ANOVA run on hedges found no significant main effect of discipline, F (2, 171) = 0.020, p = .980, η_p^2 = .000. In other words, the frequencies of hedges in applied linguistics (M = 9.09, SD = 4.44), education (M = 9.10, SD =4.38), and psychology (M = 9.21, SD =4.01) did not differ significantly from each other. Thus, no post hoc analyses were performed. However, the ANOVA yielded a significant main effect of paradigm, F (2, 171) = 27.550, p < .001, η_p^2 = .244. The effect size suggested that when all other effects were removed from consideration, the variable of paradigm accounted for 24.4% of the variance in the use of hedges, which was much larger than Cohen's (1988) benchmark for a large effect size (η_p^2 = .14). Pairwise comparisons applying Bonferroni tests showed that the quantitative RAs (M = 11.56, SD = 4.48) used hedges clearly more frequently than both the qualitative RAs (M = 6.48, SD = 2.78) (p < .001) and the mixed methods RAs (M = 9.37, SD = 3.75) (p =.005). In addition, the mixed methods RAs used hedges more frequently than the qualitative RAs (p < .001). There was no significant interaction between paradigm and discipline, F (4, 171) = 0.923, p = .452, η_p^2 = .021. These patterns are illustrated in Figure 6.2 (see p.265).

The textual analysis of the corpus data indicated that the distribution of hedges across the three research paradigms was similar in terms of linguistic forms and

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discourse functions. Table 6.2 shows the absolute (raw number) and the relative frequencies (per 1,000 words) of the most frequent hedges used in each paradigm. In each paradigmatic subcorpus, the most frequently-occurring hedges included three main lexico-grammatical categories: modal verbs expressing epistemic modality (e.g., *could*, *may*, *might*, *would*), epistemic verbs (e.g., *appear*, *indicate*, *seem*, *suggest*, *tend to*), and epistemic adjectives and adverbs (e.g., *possible*, *likely*, *perhaps*). These findings about the most frequent types and tokens of hedging devices in my corpus paralleled those in Hyland (1996a, 1996b, 1998a, 1998b) where the use of similar grammatical categories and specific tokens was reported.

Table 6.2

Most Frequently-used Hedges by Paradigm

Quantitative			Qualitative			Mixed		
Features	*n*	Per 1000	Features	*n*	Per 1000	Features	*n*	Per 1000
may	494	2.27	may	503	1.49	may	446	1.50
suggest	261	1.20	could	196	0.58	suggest	271	0.91
would	218	1.00	seem	187	0.55	might	235	0.79
might	216	0.99	might	176	0.52	would	198	0.67
could	162	0.75	would	151	0.45	seem	189	0.64
indicate	124	0.57	suggest	149	0.44	could	186	0.54
likely	107	0.49	appear	125	0.37	appear	159	0.50
seem	106	0.49	likely	81	0.24	indicate	147	0.49
appear	89	0.41	tend to	56	0.17	likely	144	0.24
possible	66	0.30	indicate	56	0.17	perhaps	72	0.23

Regarding the rhetorical functions, hedges in the post-method RA sections were used to (a) mitigate the strength of knowledge claims, (b) negotiate alternative explanations, (c) anticipate research limitations, (d) draw tentative implications, and (e) speculate on further research.

6.1.2.1 Mitigating knowledge claims

When drawing conclusions from data or extrapolating knowledge claims from research results/findings, the RA writers in the present study tended to hedge their claims by displaying a degree of caution and tentativeness. As Myers (1989) suggested, a knowledge claim without hedging might not be "a statement of new knowledge" (p. 13). The strategic deployment of hedges allowed the RA writers to present their knowledge claims with an appropriate degree of confidence, and at the same time, to humble themselves before the entire disciplinary community to persuade their colleagues (Hyland, 1996a, 1996b, 1998a, 1998b; Myers, 1989). While various forms of hedges could be used to mitigate the strength of the knowledge claims derived from research results, a typical way of hedging those claims in the post-method RA sections, particularly in the quantitative RAs and some mixed methods RAs, was to combine "abstract rhetors" (Hyland, 1996a, p.257), namely, inanimate subjects (e.g., *data*, *finding*), with epistemic verbs (e.g., *suggest*, *indicate*). Such a pattern of hedging not only attenuated the degrees of certainty of the knowledge claims, but also allowed the RA writers to attribute their knowledge claims to research entities other than themselves. This concealed their responsibility as authors and represented the knowledge claims as the discovered rather than constructed truths (Hyland, 1998a). This pattern is exemplified by the following example.

(86) The data **suggest** that L1 links (word association) are strongest when an individual is less proficient in the language and that only with increased proficiency do learners begin to conceptually mediate. (APL/QUAN12)

(87) These findings **indicate** that the program did not succeed in significantly enhancing fourth graders' fluency in decoding words. (EDU/QUAN11)

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(88) These findings provide support for the impact of BSFT on parent-reported family functioning but **suggest** that TAU **may** also be having a positive impact on both parent and adolescent reports of family functioning. (PSY/QUAN13)

(89) Taken together, these results **suggest** that client involvement was slightly lower during immediacy events than before or after. (PSY/MM06)

6.1.2.2 Negotiating plausible explanations

Another important discourse function of hedges in this study was to negotiate plausible explanations for research results/findings. When interpreting research results, it was typical for the RA writers in this corpus to offer speculative explanations of (un)expected outcomes (Example 90), for deriving a generalizable causal claim from their results (Example 91), and for providing an alternative explanation (Example 92). While this discourse function of hedges was commonly present in all three paradigms, it seemed particularly frequent in the quantitative and the mixed methods RAs. Hedges frequently used for this discourse function included the modal verbs *could*, *may*, and *might*, the epistemic adjectives *possible* or adverbs *perhaps*, as well as the noun *possibility*. As illustrated below, making use of such uncertainty markers, the RAs writers were able to open up textual space to entertain different interpretations and negotiate the most plausible one with their readers.

(90) Surprisingly, however, the interpreted version combines the content of the right with the question about invoking the right, which has not been asked by MP2 yet. A possible explanation for this **could** be that MI3 is going through a 'routinised' practice of caution delivery based on previous experiences in interpreting the cautions, and is assuming that the comprehension check does not have significance. (APL/QUAL05)

(91) This finding **may** support a directional link in which internalizing pathology leads to disrupted marital relations. (PSY/QUAN11)

(92) Another **possibility** is that students in the diagram condition learned from the translation they had to make from the collaborative text to revision of the individual diagram (Ainsworth, Bibby, & Wood, 2002). (EDU/MM18)

6.1.2.3 Drawing tentative implications

Hedges in the post-method RAs sections were also found to be frequently used in drawing tentative implications based on research results. As empirical research results might be limited in their applicability, it was likely that the RA writers would show due circumspection when drawing pedagogical (Examples 93 and 94) or clinical implications (Example 95).

(93) The findings of the present study support approaches to comprehensibility instruction that focus extensively on prosody (e.g., Grant, 2001). Teaching and practicing suprasegmental aspects of production (e.g., intonation, stress, rhythm, rate, and volume) **may** result in meaningful enhancement in perceived oral proficiency. ELLs **may** do well to focus especially on pausing silently and using falling tones at the end of idea units, on maintaining fluency within runs (i.e., avoiding pauses within idea units), and on using rising tones appropriately to achieve sentence focus. (APL/QUAN13)

(94) Furthermore, the findings **sugges**t that constructivist instruction **could** have positive motivational consequences in terms of students' perceptions of their competence and their valuing of academic tasks in English classrooms. (EDU/QUAN12)

(95) The results from this study and the Kasper et al. (2008) study **indicate** that immediacy **can** be a powerful and helpful intervention if used at the right time with the right client for therapeutic reasons in a way that fits the client's needs. For example, **it appears that** it is useful for therapists to use immediacy to check in with clients about their reactions to therapy. (PSY/MM04)

In addition, implications for pedagogy or clinical practice were often offered in a personalized way in that the RA writers used their self-attested experience or

reasoning to advise their readers on how to make use of their research findings. For example, the implications were drawn from "our experience" (Example 96), and indicated by "our participants" (Example 97), or even offered as the authors' "conjecture" (Example 98), which not only hedged the applicability of those implications, but also seemed less imposing or face-threatening to other researchers or practitioners.

(96) To sum up, our experience **suggests** that the incorporation of narratives into the curriculum offers one demonstrably effective means of empowering students in their efforts to negotiate high-stakes environments such as workplace settings. (APL/QUAL17)

(97) As our participants indicated, **perhaps** supervisors should own their errors and use that disclosure as a basis for discussing the conflict and possible resolution. (PSY/QUAL12)

(98) To further this end, we **conjecture that** a possible strategy is to make teacher-education students' own pedagogical, epistemological, and socio-cultural views about learning and knowledge-building more visible to themselves. (EDU/MM09)

6.1.2.4 Speculating on potential limitations

The RA writers in this study also hedged frequently in the post-method RA sections to speculate on potential limitations of their research. Since every empirical study was likely to be subject to both foreseeable and unforeseeable constraints, it was plausible for the RA writers to speculate on and acknowledge the possible liabilities of their research. For example, one common research limitation anticipated by most researchers, particularly in the quantitative RAs, concerned the generalizability of the research results.

(99) Third, the use of the same type of writing task on five occasions **might** also be considered a limitation because it does not include opportunities for learners to demonstrate their ability to perform with the same level of accuracy when writing in other genres. (APL/QUAN15)

(100) In brief, our results leave open the **possibility** that our findings **may** not generalize to different subjects, tasks, and settings, yet, at the same time, **we know of no reason** why they would not.(EDU/QUAN10)

(101) We acknowledge that the generalizability of case studies is limited, however, we specifically selected two successful cases from an RCT in which the therapists were highly adherent to their manual to increase the **likelihood** that the results **would** speak to the treatment models as they were intended to be delivered. (PSY/MM16)

Moreover, the RA writers in the corpus were also likely to speculate on how contextual variables might have affected the research results. For example:

(102) It is possible to **speculate** that this spurious finding was due to either ceiling or floor effects due to extreme response style later on during the studies, or that student teachers were prone to express a mastery-avoidance goal orientation (Elliot & McGregor, 2001), a measure not included in the current study. (EDU/QUAN10)

(103) We were aware that the results of the study **would** be significantly shaped by the choice of interview questions. (PSY/QUAL10)

6.1.2.5 Anticipating further research

Finally, hedges were also found to be used frequently to suggest further research, typically near the closing parts of the discussion or the conclusion in the post-method RA sections. As can be seen in the following examples, modal verbs were the most frequent hedging devices used by the RA writers to attenuate imposition of suggestions for further research.

(104) Future investigations **could** also pursue more in-depth analysis of the performance among members of Group 3. (APL/QUAN14)

(105) I **would** indeed encourage more research into how such issues **might** be addressed in teacher education.(EDU/QUAL01)

(106) Future studies **may** identify additional predictors (as well as moderators or mediators) such as age of onset or duration of illness. (PSY/QUAN07)

(107) It **would** also be interesting to use the qualitative method developed for these two cases to assess the effects of other therapist interventions (e.g., interpretations, self-disclosures).   (PSY/MM04)

To sum up, the above analyses suggested that hedges in the post-method RA sections may take a variety of forms and serve a range of discourse functions. The RA writers in this corpus typically employed hedges to modulate the degree of certainty of their interpretation of research findings, negotiate explanations, speculate on research limitations and implications, as well as "suggest" further research.

The finding that there were no significant interdisciplinary differences in the frequency of hedges is not surprising, considering that the three disciplines under investigation belong to the same general area of knowledge, namely, social sciences. While disciplines of education and psychology were rarely examined in previous literature, applied linguistics was often investigated in comparative studies. However, with regard to applied linguistics, there were some discrepancies between the results of this study and some of the previous research (e.g., Hyland, 1998a, 2005c; Vold, 2006). For example, the normalized frequency of hedges was 9.09 per thousand words in applied linguistics in this study, which differed somewhat from the frequencies of 13.3 per thousand in Hyland (1998a), 18.0 per thousand in Hyland (2005c), and 3.3 per thousand in Vold (2006). My result about hedges, however, was more consistent with Lafuente-Millán's (2008) study, where the normalized frequency for hedges was

8.95 per thousand words in applied linguistics. The discrepancy between this study and others may be a result of different operationalization of hedges. For instance, Hyland's (1998a) study of hedges is more inclusive where many approximators, such as *quite*, *about*, *around*, *more or less*, were included. Those items, however, have been excluded from this study because they are typically semantic modifiers used to modify individual lexical items rather than pragmatic markers used to qualify entire propositions. By contrast, Vold (2006) focused only on a narrow range of epistemic modality markers and excluded many other hedging devices, such as *in my view*, *possibility*. Thus, how the category of hedges is defined and delimited may greatly affect the frequency and type of hedges found in different corpora.

Although no previous study has focused on the use of hedges in different paradigms, the findings from this study are consistent with the impression that quantitative study tends to be more speculative and tentative in tone (Hansen, 1988).

6.1.3 Boosters

Whereas hedges express RA writers' tentativeness and uncertainty towards propositional content, boosters convey their commitment to and certainty of knowledge. Thus, boosters can be seen as the other side of epistemic modality. In this subsection, the results of quantitative and qualitative analyses on the use of boosters are presented.

The ANOVA on boosters yielded both a significant main effect of discipline, F (2, 171) = 16.566, p = .001, η_p^2 = .162, and a significant main effect of paradigm, F (2, 171) = 16.415, p < .001, η_p^2 = .161. However, no significant effect of disciplinary and paradigmatic interaction was discovered, F (4, 171) = 1.691, p = .154, η_p^2 = .038. Post hoc analyses comparing the disciplines revealed that both the education RAs (M =

3.16, SD = 1.77) and the applied linguistics RAs (M = 3.14, SD = 1.51) used boosters significantly more frequently than the psychology RAs (M =1.84, SD = 1.42) (p < .001, p < .001 respectively). No significant difference was found between the former two groups (p =1.000). Post hoc analyses comparing the paradigms revealed that the quantitative RAs (M = 3.25, SD = 1.86) used boosters significantly (p < .001) more frequently than the qualitative RAs (M = 1.85, SD = 1.04) but showed no difference (p = 1.000) from the mixed methods RAs (M =3.04, SD = 1.71). In addition, the mixed methods RAs used boosters significantly (p < .001) more frequently than the qualitative RAs. These patterns are illustrated in Figure 6.1 and Figure 6.2.

Textual analysis revealed that the quantitative, the qualitative, and the mixed methods RAs employed a similar range of boosters to underscore the authors' commitment to knowledge claims. Table 6.3 provides a summary of the absolute frequencies (raw numbers) and the relative frequencies (per 1,000 words) of the most frequent boosters in the three sub-corpora. As can be seen, the most often used boosters included modal verbs (e.g., *will*), epistemic verbs (e.g., *show*, *reveal*, *find*), epistemic adjectives and adverbs (e.g., *clear, clearly*, *indeed*), nouns (e.g., *the fact that*), and phrases (e.g., *in fact*).

Table 6.3

Most Frequently-used Boosters by Paradigm

Quantitative			Qualitative			Mixed		
Features	*n*	Per 1000	Features	*n*	Per 1000	Features	*n*	Per 1000
show	116	0.53	will(not)	59	0.17	show	109	0.37
reveal	63	0.29	show	51	0.15	reveal	90	0.30
clearly	47	0.22	Indeed	49	0.14	the fact that	74	0.25
will (not)	47	0.22	clearly	46	0.14	will (not)	65	0.22
indeed	41	0.19	In fact	41	0.12	do/did/does	59	0.20
in fact	34	0.16	reveal	36	0.11	in fact	55	0.19
the fact that	34	0.16	the fact that	34	0.10	indeed	55	0.19
find	34	0.16	do/did/does	30	0.09	clearly	51	0.17
do/did/does	27	0.12	certainly	18	0.05	find	34	0.11
cannot	16	0.07	it is clear	18	0.05	it is clear	27	0.09

A closer examination of the data indicated some differences in the use of specific boosters, particularly between the quantitative and the qualitative RAs. For example, a typical pattern of boosting in the quantitative RAs was to increase commitment to what had been found, or the "evidential truth" (Skelton, 1997, p. 128). The most frequently used boosters such as *show, reveal,* and *find* provided strong evidence, usually statistically results, to support knowledge claims. In addition, these boosters were often collocated with the inanimate subjects such as *results*, *analyses* and *study* which, similarly to hedges, attributed agency to abstract rhetors (Hyland, 1996a), namely, research procedures or data, and concealed the "interpretive role" (Hyland, 1998, p.356) played by the researcher. For example:

(108) Multilevel process analyses **showed** that supportive behaviour incidents correlated with a positive social climate during the current lesson and the lesson a week later in terms of teacher interpersonal proximity.(EDU/QUAN09)

(109) As demonstrated in Table 3, analysis of LHA Self-Directed Violence **revealed** a <u>main effect</u> of MASQ Anhedonic Depression (β= .20, p < .001), with depressive tendencies positively related to a history of self-directed violence. (PSY/QUAN17)

(110) This study **found** that situation type had a <u>significant effect</u> on both appropriateness scores and production speed in L2 speech act production.(APL/QUAN02)

As the above examples illustrate, boosters used in these contexts tended to stress the certainty of statistical evidence or proof, which was reflected in expressions such as *correlated with* (Example 108), *main effect* (Example 109), or *significant effect* (Example 110). These boosters typically occurred in the results sections of the RAs where quantitative analyses or results were presented. The use of boosters, in combination with inanimate subjects, implied a view of knowledge-making where the facts seemed to speak for themselves (Hyland, 1998a). In other words, the personal involvement of the authors or researchers was cancelled and an objective stance was displayed towards the research results.

In comparison, *show* and *reveal* as boosters also occurred frequently in the qualitative RAs. Instead of showing statistical proof, they were typically used to increase the strength of the accompanying knowledge claims derived from the authors' inference or interpretation based on qualitative data analyses. For example:

(111) Comments from the interviewees **showed** that parents had played and were still playing an active role in their English learning. (APL/QUAL13)

(112) In sum, the strategy analysis **showed** that the facilitators used a common set of strategies to achieve multiple goals. (EDU/QUAL20)

(113) The analysis also **revealed** that the migrants used narratives as ways of constructing a convincing professional identity in their new workplaces. (APL/QUAL17)

(114) The themes that emerged from the data **revealed** that the participants experienced their work transition in three separate phases: (a) pretransition, (b) during the transition, and (c) posttransition (see Table 1). (PSY/QUAL08)

In general, the use of the boosters in the mixed methods RAs was more comparable to that of the quantitative RAs, where claims about results were boosted typically by statistical evidence (Examples 115 and 116). However, due to the nature of mixed evidence, the mixed methods RA writers also used these boosters to underscore interpretive strength, as did in the qualitative RAs (Example 117).

(115) The MANOVA analysis **showed** that the school-age students had significantly higher means on the covert prestige and the image projection factors; (APL/MM07)

(116) We **found** that it was reliably more likely for students' representations to receive higher levels in the second half of the discourse, t (40) = 3.27, MS = .35, $p < .005$. (EDU/MM12)

(117) Our qualitative analysis will **show** that the local activities did spark and could have easily supported these types of rich discussions. (EDU/MM05)

Regarding cross-disciplinary differences, while the quantitative results showed that frequencies of boosters varied significantly between the psychology RAs on the one hand and the education and the applied linguistics RAs on the other, textual analyses indicated both similarities and differences in the most frequently-used boosters.

Table 6.4

Most Frequently-used Boosters by Discipline

Applied linguistics			Education			Psychology		
Feature	n	Per 1000	Feature	n	Per 1000	Feature	n	Per 1000
show	136	0.49	show	119	0.37	will (not)	50	0.20
indeed	75	0.27	reveal	82	0.26	reveal	48	0.19
clearly	65	0.23	do/did/does	68	0.21	the fact that	31	0.12
will (not)	60	0.21	will (not)	61	0.19	in fact	30	0.12
reveal	59	0.21	clearly	58	0.18	indeed	27	0.11
the fact that	53	0.19	In fact	58	0.18	show	26	0.10
in fact	42	0.15	the fact that	58	0.18	clearly	21	0.08
do/did/does	27	0.10	Indeed	43	0.14	do/did/does	19	0.07
it (be) clear	26	0.09	find	43	0.04	actually	17	0.07
find	24	0.09	it (be) clear	26	0.08	find	16	0.06

As can be seen in Table 6.4, the most frequently used boosters were largely similar across the disciplines. However, in both the education and the applied linguistics RAs, the evidential verb *show* occurred most frequently (Examples 118 and 119). In comparison, in the psychology RAs, whereas the incidence of *show* was markedly lower than those in the other two disciplines, the modal verb *will* occurred most frequently. As the following examples illustrate, the booster *will* in the psychology RAs was typically used to increase writer's commitment to prediction (Example 120) or to emphasize the need for further research (Example 121).

(118) To summarize, the results of Experiment 3 **show** that in terms of quantity of errors, the heritage speakers were more accurate than L2 learners in this experiment, as the experimental hypothesis framed within the deficit view of L2 acquisition predicted. (APL/QUAN08)

(119) In summary, the results **show** that pupils in Vietnam experience motivational interference following a school-leisure conflict depending on their value orientations. (EDU/QUAN07)

(120) Without opportunities for professional development, these workers **will** have minimal chances to fulfill their needs for advancement, their earning power **will** be restricted, and options **will** be limited to the "brown collar" jobs. (PSY/QUAL07)

(121) It **will** be important to replicate these findings with spouse-, observer-, or laboratory-based measures of marital quality and informant or clinician report of pathology. (PSY/QUAN11)

In short, the statistical analyses revealed that both the quantitative RAs and the mixed methods RAs used significantly more frequent boosters than the qualitative RAs. Cross-disciplinarily, both the applied linguistics and the education RAs used significantly more frequent boosters, than the psychology RAs. Cross-disciplinary and cross-paradigmatic differences were also present in the use of specific boosters in presenting results and underscoring interpretation.

As with hedges, little previous research compared the use of boosters between paradigms. While cross-disciplinary studies on boosters (e.g., Hyland, 1998a, 2005c; Lafuente-Millán, 2008; Peacock, 2006) generally found broad differences between sciences and non-sciences, no previous study included education and psychology for comparison. Although applied linguistics was included in previous research, the results from the present study differed largely from the findings of those previous studies. For example, whereas the normalized frequency of boosters in the applied linguistics RAs was 3.16 per thousand words in this study, Hyland (1998a) reported a frequency of 6.2 per thousand in the same discipline and Peacock (2006) found an even higher frequency of 10.98 per thousand words in language and linguistics. Only Lafuente-Millán (2008) reported a similar frequency of 2.79 per thousand words in applied linguistics. Such discrepancies in the observed frequencies, as with hedges,

may be attributed to the issue of delimitation of boosters in each study. For example, Hyland (1998a) counted intensifiers such as *most* as instances of boosters, and Peacock (2006) included a wide range of linguistic resources as boosters, particularly some evaluative adjectives and adverbs, such as *convincingly*, *enhanced*, *successfully*, *sizable*, *unlimited*. Because boosters are a type of metadiscourse in this study, these expressions were not counted as boosters if they were not used as metadiscourse in specific contexts. This may partially explain the different findings from this and other studies.

6.1.4 Attitude markers

According to Hyland (2005b), attitude markers refer to "the writers' affective, rather than epistemic, attitude to propositions" (p.53). The scope of attitude markers overlaps to a large extent with other discourse phenomena such as evaluation (Thompson & Hunston, 2000), attitudinal stance (Conrad & Biber, 2000), and the subsystem of attitude in appraisal framework (Martin, 2000). The use of attitude markers or evaluative language, as pointed out by Thompson and Hunston (2000), expresses not only writers' personal opinions and emotions, but also reflects their communal value systems. In the following, I first present the results of the quantitative analysis of attitude markers in the corpus, and then I present the results of the qualitative analysis conducted to identify the discourse functions of attitude markers.

The ANOVA run on attitude markers showed a significant effect of paradigm, F (2, 171) = 3.046, p = .050, η_p^2 = .034. The effect size indicated that paradigm accounted for 3.4% of the variance in the use of attitude markers. Post hoc analyses indicated that the quantitative RAs (M = 2.04, SD = 1.17) used significantly more

frequent boosters than the qualitative RAs ($M = 1.58$, $SD = 0.99$) ($p = .045$), but showed no difference from the mixed methods RAs ($M = 1.84$, $SD = 0.91$) ($p = .865$). The latter two subcorpora showed no significant difference in the use of attitude markers ($p = .494$). No significant main effect of discipline was found, $F (2, 171) = 0.922$, $p = .400$, $\eta_p^2 = .011$. Neither was there any significant interaction between paradigm and discipline was found, $F (4, 171) = 0.778$, $p = .541$, $\eta_p^2 = .018$. That is, the frequencies of attitude markers in the applied linguistics ($M = 1.91$, $SD = 1.17$) , education ($M = 1.68$, $SD = 1.04$), and psychology ($M = 1.84$, $SD = 0.89$) subcorpora are more or less similar. These patterns are represented in Figure 6.1.

A functional analysis of attitude markers was not easy because unlike the epistemic dimension of metadiscourse, it is difficult to classify attitude markers neatly into tidy subsystems of evaluation since they are used to express various discourse meanings. Drawing on previous analytical frameworks (e.g., Lemke, 1998; Thompson & Hunston, 2000) and based on my own bottom-up corpus analyses, I identified five distinct functions of attitude markers in this study: obligation, expectability, significance, desirability, and assessment. The parameter of obligation expresses the writer's evaluation of what is obligatory or necessary, which was mainly realized through modal verbs expressing deontic meaning (e.g., *should*, *need to*, *must*). The parameter of expectability denotes the writer's evaluation of the propositional content as either expected or unexpected, which was realized in this corpus by such lexico-grammatical resources as attitudinal adverbs (e.g., *expectedly*, *surprisingly*), phrases (e.g., *contrary to expectation*, *most striking*), and clauses (e.g., *we expected that*, *we were surprised that*). The parameter of desirability conveys the writers' personal feelings towards propositional content and was typically expressed in the

corpus by attitudinal adverbs (e.g., *fortunately*, *hopefully*) and clauses (e.g., *we hope*, *it's encouraging that, what is disappointing is that*). The parameter of significance stresses the writer's evaluation of importance or interestingness of the propositional content and was mostly realized through stance adverbs, phrases, and clauses (e.g., *importantly*, *interestingly*, *of interest*, *it's important that*). Finally, due to their relative infrequency, attitude markers expressing other types of the writer's evaluation of propositions such as judgment (e.g., *difficult*, *premature*), worthiness (e.g., *valuable*, *worthwhile*), and usefulness (e.g., *useful*, *feasible*) were subsumed under a general parameter of assessment. The linguistic forms for expressing assessment included mostly attitudinal adverbs (e.g., *paradoxically*, *ideally*) and *it*-clauses (e.g., *it is difficult*, *it may prove useful to*).

The analysis of attitude markers in terms of the above-noted parameters revealed little difference among the quantitative, qualitative, and mixed methods subcorpora regarding the parameters of significance, desirability, and assessment. However, the quantitative RAs exhibited some differences from the qualitative RAs in the parameters of obligation and expectability. One prominent cross-paradigmatic difference in the use of attitude markers between the quantitative and the qualitative RAs concerned the parameter of expectability whereby expressions such as *not surprisingly*, *as expected*, and *unexpectedly* were used to express the RA writers' attitudes of expectedness/unexpectedness. Typically, the writers of the quantitative RAs used this type of attitude markers in the post-method sections when reporting research results. As illustrated in Examples 122 to 124, most of the quantitative RAs formulated predictions or hypotheses about the expected research outcome; therefore, an important aspect of reporting research results in the quantitative RAs was to

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evaluate whether the actual results confirmed or disconfirmed the prior hypotheses outcome.

> (122) **As anticipated**, the high-exposure group and the monolingual NSS group did not differ in their average kernel recall, Wilk's λ = .928, F (3, 55) = 1.424, p = .246. (APL/QUAN10)
>
> (123) **Contrary to our expectations**, guidance did not have an impact on students' perceived usefulness of the Debate-tool. (EDU/QUAN08)
>
> (124) **As expected** (see Table 3), women in agency settings reported significantly higher levels of emotional exhaustion than women in either solo or group independent practice. (PSY/QUAN15)

In comparison, attitude markers of expectability were not only infrequent in the qualitative RAs, but were seldom used in reporting research results. Rather, most attitude markers of this type in the qualitative RAs occurred in the discussion sections where the writers commented on the findings, as shown in the following examples.

> (125) **It is not surprising** that such a personal and ego-involving endeavor as language learning is the subject of feelings of anxiety, and it is important to understand how this anxiety functions in language learning. (APL/QUAL13)
>
> (126) For this reason, **it is expected** that teachers and pupils may avoid interactions that significantly deviate from the comfort of established genres. (EDU/QUAL08)
>
> (127) Our own biases were apparent, as we were **surprised** that many of our participants had experienced a better work reaction than anticipated. (PSY/QUAL08)

With respect to the parameter of obligation, by adapting Giltrow's (2005) classification of "knowledge deontics" and "field deontics" (p.177), I similarly distinguished between knowledge obligation and field obligation according to the specific discourse functions of the attitude markers of obligation in this study. Knowledge obligation refers to the use of attitude markers of obligation (e.g., *should*,

must, *need to*) to prescribe acts related to research activities (Example 128); in comparison, field obligation is defined as the use of attitude markers to express obligating acts related to practice in a disciplinary field (Example 129). As shown in Example 128, the modal verb *need to* was used by the RA author to obligate disciplinary readers to conduct more research on new variables; thus it marked a knowledge obligation. In comparison, the author of Example 129 prescribed acts for instructors who work in the field of language teaching by using *should* and *must*, therefore, these two attitude markers expressed field obligation.

(128) Future research **needs to** explore these additional factors. (PSY/QUAN01)

(129) Furthermore, not only **should** instructors learn about their students, but they **must** also be cognizant of the metanarratives circulating within their own professional groups and communities. (APL/QUAL03)

A closer look at the corpus data indicated that the quantitative RAs used more knowledge obligations in the post-method RAs sections, whereas the qualitative RAs employed more field obligations. For example, knowledge obligations were often used in quantitative RAs to express the necessity for acknowledging research limitations (Examples 130-132) or conducting further research (Examples 133-135).

(130) Several methodological issues **should** be kept in mind when interpreting the results of this study.(APL/QUAN08)

(131) Nonetheless, it **has to** be taken into account that the analyses were based on a convenience sample.   (EDU/QUAN09)

(132) Thus, caution **should** be taken in generalizing these findings to other racial/ethnic groups. (PSY/QUAN10)

(133) Based on these limitations, future research **should** apply a wider range of oral fluency measures to confirm the generalizability of the present findings. (APL/QUAN02)

(134) More work **must** be done on methods of developing aligned assessments. (EDU/QUAN13)

(135) Future research **should** replicate these results in other treatment settings with more attention to clients' presenting concerns. (PSY/QUAN13)

By comparison, the qualitative RAs more commonly used field obligations to obligate practitioners such as teachers or counselors to improve their fieldwork based on research-generated knowledge. For example, field obligations were typically used in making practical suggestions for pedagogical (Examples 136 and 137) or clinical practice (Example138). As the use of these attitude markers might be face-threatening, hedges were sometimes used in tandem with modals of obligation to mitigate the imposition towards those professionals (Examples 139 and 140, see the underlined parts for hedges). As the following examples illustrate, in all three disciplines, it was common for RA writers to link research with practice, probably with a view to translating their research findings into applicable pedagogies or therapies. Through the use of modal verbs of obligation, the RA writers in the corpus displayed much confidence and authority in promoting the application of their findings to parents, educators, and counselors.

(136) Certainly, novice educators **should** be encouraged to further develop interculturality outside the classroom, whether in another country or another neighborhood. (APL/QUAL20)

(137) Today's curriculum leaders **must** be able to get beyond modern binaries, dualisms, and centrist tendencies in order to work with the natural tensions and differences of education. (EDU/QUAL19)

(138) In addition, given the strong emphasis on family relationships and interpersonal harmony in many cultures, counseling psychologists **should** develop culturally sensitive interventions that help survivors negotiate cultural

values related to family reputation and interpersonal harmony in their struggles with CSA disclosure. (PSY/QUAL19)

(139) For such reasons, coordinators and faculty <u>may</u> **need to** place more focused attention on the intersection of literary scholarship and the pedagogy of literature when training and socializing graduate students (APL/QUAL10)

(140) In particular, because most participants reported mistrust particularly toward male individuals and authority figures, male practitioners <u>may</u> **need to** be particularly sensitive to gender dynamics in counseling relationships and <u>may</u> **need to** collaborate with female survivors in establishing a trusting and safe therapeutic environment. (PSY/QUAL19)

In summary, attitude markers in the post-method RA sections were mainly realized by deontic modal verbs, attitudinal adverbs, and *it*-clauses. Cross-paradigmatically, the use of attitude markers occurred significantly more frequently in the quantitative RAs than in the qualitative RAs. In addition, the qualitative analyses indicated that these two subcorpora of RAs also differed in the use of attitude markers to express specific parameters of evaluation such as expectability and obligation. In terms of disciplinary influences, no obvious differences were found in this study.

The frequencies of the attitude markers in this study are much lower compared with those found in some previous research (e.g., Hyland, 2005c; Mur-Dueñas, 2010). While the reported normalized frequencies of attitude markers in Hyland (2005c) were 8.9 for philosophy, 7.0 for sociology, 8.6 for applied linguistics and 6.9 for marketing, Mur-Dueñas (2010) reported an overall frequency of 8.1 per thousand words in her business management subcorpus. The frequency of attitude markers (2.7 per thousand words) found in mathematics RAs (McGrath & Kuteeva, 2012), however, seems to be somewhat similar to the results of this study. These

discrepancies may be related to the fact that attitude markers constitute a vague category and different scholars may have different criteria for identifying the target features. For example, some researchers did not distinguish between metadiscoursal attitude markers from evaluative lexis, which should be treated as part of propositional discourse because they were used to evaluate individual words and expressions within a proposition rather than the proposition itself. This study focuses on only metadiscoursal attitude markers, which might have resulted in a lower frequency of the target features in the three disciplines examined, as compared with frequencies reported in previous research.

6.1.5 Self-mentions

Self-mentions in RAs convey explicit authorial presence by using the first-person pronouns (e.g., *I*, *we*) and determiners (e.g., *my*, *our*). The appropriate use of these features is crucial to the expression of authorial stances and identities. In the following section, I present the results from both quantitative and qualitative analyses of self-mentions in the present corpus.

First, the ANOVA run on self-mentions yielded a significant main effect of discipline, F (2, 171) = 4.370, p =.014, η_p^2 = .049, but a non-significant effect of paradigm, F (2, 171) = 1.930, p =.148, η_p^2 = .022. There was no significant interaction between paradigm and discipline, F (4, 171) = 1.021, p =.398, η_p^2 =.023. Post hoc analyses showed that the psychology RAs (M = 4.53, SD = 4.03) used self-mentions significantly more frequently than the applied linguistics RAs (M = 2.77, SD = 2.77) (p = .014), but did not differ from the education RAs (M = 4.02, SD = 3.21) (p =1.000). The latter two subcorpora did not show any significant differences in the use of self-mentions (p =.127). These patterns are illustrated in Figure 6.1 (see p.267).

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An examination of the forms of self-mentions in the corpus indicated that this type of interactional metadiscourse was mainly realized by the exclusive first-person pronouns and the first-person determiners. Table 6.5 presents the distribution of the various forms of self-mentions across the three disciplines under examination. There were clear cross-disciplinary differences in the distribution of first-person singular pronouns and determiners. Whereas forms such as *I*, *my*, and *me* accounted for around 30% of the total self-mentions in the applied linguistics RAs and about 11% in the educational RAs, they were rarely used in the psychology RAs, making up less than 1% of all self-mentions. On the other hand, the use of the first-person plural forms, such as exclusive *we*, *our*, and *us*, accounted for around 99% of the total self-mentions in the psychology RAs, as compared with around 88% in the education RAs, and about 69% in the applied linguistics RAs.

Table 6.5

Distribution of Forms of Self-mentions across Disciplines

	Applied Linguistics			Education			Psychology		
Form	*n*	Percent	Per1000	*n*	Percent	Per1000	*n*	Percent	Per1000
I	144	19.5%	0.51	120	9.1%	0.38	3	0.3%	0.01
my	36	4.9%	0.13	11	0.8%	0.03	2	0.2%	0.01
me	31	4.2%	0.11	7	0.5%	0.02	0	0	0
Subtotal	211	28.6%	0.75	138	10.4%	0.43	5	0.5%	0.02
we	324	43.8%	1.16	792	59.8%	2.49	547	49.3%	2.14
our	165	22.3%	0.59	345	26%	1.09	514	46.3%	2.01
us	19	2.6%	0.07	30	2.3%	0.09	22	2%	0.09
Subtotal	508	68.7%	1.82	1167	88.1%	3.67	1083	97.6%	4.24
others	20	2.7%	0.07	20	1.5%	0.06	22	2%	0.09
Total	739	100%	2.64	1325	100%	4.17	1110	100%	4.35

In addition to differences in the distribution of different forms of self-mentions

between the applied linguistics and the education RAs on the one hand, and the psychology RAs on the other, cross-disciplinary differences were also manifest in the discourse functions of self-mentions. In what follows, I examine the discourse functions of two major types of self-mentions: the first-person pronouns and the first-person determiners.

6.1.5.1 First-person pronouns

To examine the specific functions of the first-person pronouns in this study, I conducted a functional analysis of all instances of *we* and *I* in the corpus by synthesizing the analytical categories from previous research on the discourse functions of self-mentions in academic texts (e.g., Fløttum et al., 2006; Harwood, 2005a, 2005b; Hyland, 2001b, 2002b; Lafuente-Millán, 2010; Tang & John, 1999). My analysis showed that the discourse functions of the first-person pronouns in the corpus could be grouped into four broad categories: (a) structuring discourse; (b) recounting procedures; (c) elaborating arguments; and (d) presenting results and claims.

(a) *Structuring discourse*

The function of structuring discourse refers to the use of self-mentions to organize information or to state the writers/researchers' intentions. This kind of usage, as Hyland (2002b) observed, "foreground[ed] a fairly low risk writer role, simply signposting readers through the text" (p.1100). For examples, in Examples 141, 142, and 143), *I* and *we* functioned primarily as discourse guides, which often occurred together with endophoric markers (e.g., *in the following section, in this section*) and structured the textual information schematically.

(141) <u>In the remainder of this section</u>, **we** attempt to offer an explanation for the observed morphological congruency effect from a cognitive perspective. (APL/QUAN/01)

(142) **I** will discuss the graphical, proportional, and algebraic representation during the analysis of group discussion <u>in the following section</u>. (EDU/MM/10)

(143) <u>In this section</u>, **we** present the results of our analysis according to 11 domains. <u>Below</u>, **we** describe the general, typical, and variant categories that appeared within each domain, and also offer discussion of emergent themes. (PSY/QUAL17)

My analyses revealed that the education RAs used more of this discourse function in the post-method sections (Examples 144 and 145), as compared with the psychology and the applied linguistics RAs. Across the paradigms, the qualitative RAs were more likely to use this function, as compared with the quantitative and the mixed methods RAs. The endophoric markers are italicized and frame markers are underlined in each example below.

(144) *In what follows*, **we** propose two practical implications for a line of research on the professional development of instructional coaches. (EDU/QUAL05)

(145) **We** <u>now</u> <u>turn to</u> an examination of how these two students participated in school math and in basketball. <u>First</u> **we** present episodes of the students' activities in the geometry classroom and in basketball to explore how Vaughn and Kevin participated in them and how the organization of the activities supported their participation. **We** <u>then</u> offer an analysis of their engagement in basketball more broadly and how this reflected their practice-linked identities as basketball players. (EDU/QUAL11)

(b) *Recounting procedures*

In recounting procedures, RA writers use first-person pronouns to report the specific steps that have been taken in the research process. My corpus data showed

that while the RA writers from all three disciplines frequently used first-person pronouns in recounting their methodological procedures and explaining the research process, such discourse functions were particularly prominent in the education RAs, as illustrated by the following examples.

(146) **We** <u>examined </u>each knowledge component for evidence of learning and whether there were differential learning gains across opportunities as a function of condition. (EDU/QUAN17)

(147) **We** <u>used </u>2 (student status) $\times$ 2 (year in studies) ANOVAs to test for main and interaction effects that might explain the variance in tendency toward absolutism, multiplism, or evaluativism. (EDU/QUAN20)

(148) **We** <u>conducted</u> a repeated measures ANOVA with speaker L1 (two levels), Word (six levels) and Time (two levels) as within-listener factors. (APL/QUAN09)

(149) **We** then <u>conducted</u> a logistic regression analysis that allowed **us** to determine whether there were race differences in mothers' likelihood of emphasizing family relationships.(PSY/MM08)

In terms of cross-paradigmatic variations, my data analyses suggested that both the quantitative and the mixed-methods RAs were more likely to use this discourse function than the qualitative RAs. In addition, as Examples 146,147, and 148 show, the quantitative RAs typically explained research procedures by using the first-person pronouns followed by the various research acts (Hyland, 2002b), such as *examine*, *use,* or *conduct*. These phraseologies, however, appeared to be typical of control and manipulation of research activities in the quantitative paradigm. In comparison, the qualitative RAs tended to realize this discourse function by using *I* or the exclusive *we* in collocation with such verbs as *ask, observe*, *interview*, describing typical research activities in the qualitative paradigm, as illustrated in the following:

(150) Like Ruby, Paloma laughed when **I** <u>asked</u> about her cultural identity. (APL/QUAL20)

(151) In February, **we** <u>observed</u> Kate teach a 3-day lesson in which students were to create line graphs to show numbers of people coming and going at a certain location (y-axis) over the space of 12 hours (x-axis). (EDU/QUAL38)

(152) Furthermore, as with all human perception, the clients **we** <u>interviewed</u> were susceptible to biases in recall and limitations in their ability to describe complex experience. (PSY/QUAL03)

By representing themselves as well-versed in conducting research, the authors of these examples attempted to create images of themselves as competent researchers, thus adding to the credibility of their results or knowledge claims.

(c) *Elaborating arguments*

Elaborating arguments is considered a relatively high-risking discourse function of self-mentions (Hyland, 2002b), similar to what is termed "opinion-holder" (Tang & John, 1999, p.S28) or "arguer" (Fløttum, et al., 2006, p.82). Specifically, in the post-method RA sections, writers tended to use first-person pronouns to compare results (Example 153), express agreements/disagreements (Example 154), acknowledge limitations (Example 155) and make recommendations (Example 156).

(153) **Our** findings contrast with those in the Hartford study (Mueser et al., 2004), in which IPS was clearly superior to a psychosocial rehabilitation approach on both competitive and paid employment outcomes. **We** attribute this difference to a much stronger psychiatric rehabilitation program in the current study. (PSY/QUAN03)

(154) In this sense, **we** agree with Crichlow's (1999) critique of role modeling as a means by which to address racial inequality in educational institutions, "particularly if the goal of equity is dependent upon role models understood within the banal administrative discourses of cultural diversity, multiculturalism, and affirmative action" (p. 249). (EDU/QUAL15)

(155) Third, because **we** relied on cross-sectional data for our analyses, **we** cannot draw causal inferences about the relationships among the variables. (PSY/MM18)

(156) Above all, **I** encourage educators to reflect on their own (inter)cultural experiences and identities, and re-examine their approaches to teaching culture in light of those reflections (Morgan, 2004). (APL/QUAL40)

Although no obvious cross-paradigmatic differences showed up, across disciplines, the psychology RAs were more likely to employ the first-person pronouns to elaborate arguments, as compared with either the applied linguistics RAs or the education RAs. Typically, the psychology RAs used first-person pronouns to discuss research limitations, for example, due to constraints in research designs or sampling methods. As are exemplified by the following extracts (Examples 157, 158, and 159), using self-mentions to address limitations allowed the authors to represent themselves as honest researchers, which could not only protect themselves against potential criticisms, but also add to the credibility of their arguments.

(157) Further, all measures were completed at the same time; thus, **we** do not know if clients' conformity to masculine norms changed as a function of therapy. (PSY/QUAN09)

(158) Although **we** had a relatively diverse mix of therapists in terms of professional experience and cultural background, all were from the West coast. (PSY/QUAL16)

(159) Although the single-case design allowed **us** to empirically examine the process of immediacy, **we** cannot make causal conclusions about immediacy and its relationship to in-session and posttherapy change. Also, **we** cannot generalize the findings beyond the specific client and therapist (although therapists may find applications in working with similar clients). (PSY/MM46)

Self-mentions were also frequently used in the psychology RAs to make recommendations for future research or for practice. In these cases, the RA writers tended to use self-mentions together with attitude markers, such as *encourage, hope, recommend*, to make suggestions about future research or practical applications of the research results, as exemplified by the following.

(160) As discussed in the following section, **we** <u>encourage</u> researchers to further investigate these conceptualizations of interpersonal risk factors associated with Asian Americans' suicide-related outcomes. (PSY/MM18)

(161) In conclusion, **we** <u>hope</u> further study of the link between animal abuse and human violence and related treatment issues will increase therapists' awareness and effectiveness so that clients who have committed or witnessed animal abuse will be better served. (PSY/QUAN16)

(162) **We** also <u>recommend</u> that family scholars apply this approach to the study of race differences in other family contexts, such as marriage, parenting practices, and family caregiving to older relatives. (PSY/MM08)

(163) A number of suggestions to counselor educators were made, which **we** offer as practical ways of promoting the cultivation of self-compassion. (PSY/QUAL13)

(d) *Presenting results and claims*

The discourse function of presenting results and claims is generally considered the most high-risk use of self-mentions (Hyland, 2002b). This function is similar to what function of what Tang and John (1999) terms "originator" (p.S29). In my corpus, RA writers from all three disciplines and all three paradigms were found to use first-person pronouns to state research results/findings and to make knowledge claims. No apparent cross-disciplinary or cross-paradigmatic differences were found in the use of this discourse function, which perhaps indicated that in the post-method RA

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sections, presenting results and claims was equally important for writers of all disciplines and paradigms. As the following examples demonstrate, a typical way of presenting results was to use first-person pronouns together with research verbs (Hyland, 2002a) such as *find*, *identify*, or *observe*.

(164) Using Wilk's lambda, **we** <u>found</u> a main effect for Time ($F = 2.86$, $p = .02$) and for Group ($F = 2.99$, $p = .01$). (APL/MM17)

(165) In our study, **we** <u>identified</u> two major classes of students with different achievement levels. (EDU/QUAN18)

(166) In 80% of the satisfied participants, **we** <u>observed</u> contradictions in clients' descriptions about the significance of REC in the therapy relationship. (PSY/QUAL03)

Alternatively, in making knowledge claims, the RA writers sometimes employed first-person pronouns with discourse verbs (Hyland, 2002a), such as *argue*, *suggest*, or *conclude*, as illustrated by the following examples:

(167) In summary, within the limitations of a nonrandomized experiment such as the present study, **we** can <u>argue</u> that there is supportive evidence for the transfer of a reading strategy defined by the pattern of pauses used with complex L2 texts to similarly complex L1 texts. **We** <u>suggest</u> that this transfer is dependent on the length of academic immersion in the target culture that provides the learner with opportunities to develop the appropriate prosodic phrasing schema to facilitate comprehension. (APL/QUAN10)

(168) Situating my analysis within this context, **I** <u>argue</u> that specifically interrogating matters of sexuality in popular culture is a particularly promising strategy for making such curriculum relevant and for increasing student engagement in academic content. (EDU/QUAL01)

(169) From the data in these two studies, **we** <u>conclude</u> that immediacy can be a powerful way to bring relationship issues to the foreground and address them productively. (PSY/MM04)

In summary, the RA writers from all three disciplines and all the three paradigms examined in this study employed the first-person pronouns to fulfill different discourse functions as reported in this section. Across the disciplines, the education RAs used more self-mentions for the discourse functions of structuring information and recounting procedures, and the psychology RAs used more self-mentions for the purpose of elaborating arguments. Across the paradigms, the qualitative RAs used more self-mentions as discourse guides, as compared with the quantitative and the mixed methods RAs, whereas the latter two subcorpora used more self-mentions when recounting procedures.

6.1.5.2 First-person determiners

With respect to another major type of self-mention, the first-person determiners, my analysis showed that *our* was the most frequently used first-person determiner in the corpus. As can be seen from Table 6.6, across the disciplines, *our* was similarly collocated with lexical items referring to components of research such as *study*, *findings*, *results*, *data*, and *analysis*. An important function of the collocations in RAs was to attribute a proposition that followed to a personal source, which, according to Hyland (1998a), could weaken the writers' commitment to the proposition. As exemplified by the following examples (170,171, and 172), such uses of *our* attributed knowledge claims to authors and reduced the generalizability of the claims. In other words, the first-person determiners indicated that these claims were individual interpretations rather than statements of truths (Hyland, 1998a).

> (170) **Our** findings show that repetition emerges as a recurrent and frequent practice through which the players respond to salient and meaningful events in the game and display their own understanding and experiences of them. (APL/QUAL15)

(171) **Our** findings indicate that the network ties within La Estasis changed between T1 and T2, with an increase in infrequent tie activity and no change in more frequent ties. (EDU/MIXED02)

(172) **Our** study revealed that some cross-racial supervision experiences of Black trainees, however, might fail to provide a safe and educational environment to discuss and integrate racial and cultural issues in supervision and therapy. (PSY/QUAN13)

Table 6.6

Most Frequently-used Collocations with "Our"

Applied Linguistics			Education			Psychology		
Feature	*n*	per 1000 words	Feature	*n*	per 1000 words	Feature	*n*	per 1000 words
our study	43	0.15	our study	34	0.11	our participants	106	0.42
our data	10	0.04	our findings	30	0.09	our findings	79	0.31
our findings	10	0.04	our analysis(es)	28	0.09	our study	56	0.22
our results	10	0.04	our data	17	0.05	our results	34	0.13
our research	9	0.03	our results	14	0.04	our sample	31	0.12
our analysis(es)	8	0.03	our expectations	8	0.03	our analysis(es)	11	0.04
our participants	6	0.02	our hypotheses	7	0.02	our focus	6	0.02
our conclusion	3	0.01	our research	7	0.02	our research	6	0.02
our discussion	2	0.01	our experience	6	0.02	our goal	4	0.02
our learners	2	0.01	our observations	6	0.02	our hypotheses	3	0.01
Total	103	0.37	Total	157	0.49	Total	336	1.32

Whereas no obvious cross-paradigmatic variations were found in the use of first-person determiners, my analyses revealed that the psychology RAs were more likely to use this type of self-mentions as compared with the education RAs and, particularly, the applied linguistics RAs. In addition, where *our participant(s)* was the most frequent-occurring collocation in psychology, it had very low incidence in applied linguistics and education. As Examples 173 and 174 illustrate, the psychology RA writers typically used the collocation of *our participants* in qualitative studies to report the activities, views or beliefs of their research participants. By contrast, the RA writers in education and applied linguistics rarely used collocations such as *our participants*, *our learners*, or *our students* in reporting their research, even in qualitative studies.

(173) **Our** participants viewed work as a means for personal and familial development and advancement. (PSY/QUAL07)

(174) As **our** participants revealed, antiracist action can be life-affirming and rewarding, yet it is also the road less traveled by. (PSY/QUAL17)

To conclude, the first-person determiner *our* was the second most frequently used self-mention device in my corpus. It frequently collocated with research entities and attributed the source of propositions to the RA writers. In general, the psychology RAs were more likely to use *our* in the post-method sections, as compared with the education and the applied linguistics RAs.

The findings of this study are more or less comparable with those reported in previous research on self-mentions in a range of social science disciplines (e.g. Harwood, 2005b; Hyland, 2001b, 2005c; Lafuente-Millán, 2010). For example, the normalized frequencies of self-mentions in Hyland's (2001b) four soft disciplines

were 4.71 in sociology, 5.18 in applied linguistics, 5.27 in philosophy, and 6.13 in marketing, which are slightly higher than 3.25 in economics and 4.24 in business management in Harwood's (2005b) study. Lafuente-Millán (2010) reported a normalized frequency of 3.25 in applied linguistics, which is slightly higher than that found in this study. This could be due to the fact that while most previous research examined self-mentions in the entire RAs, this study simply focused on the post-method sections.

6.1.6 Engagement markers

While hedges, boosters, attitude markers, as well as self-mentions are used primarily for signaling writers' stances, engagement markers function to recruit readers to participate in the argument. The use of directives, reader references, questions, knowledge appeals, and personal asides in the post-method RA sections aimed to elicit agreement from "reader-in-the-text" (Thompson, 2001, p.58) and align such hypothetical readers' positions with those of the writer. In what follows, I present findings of both engagement markers as a main type and of each subtype of engagement markers found in the present corpus.

Overall, the ANOVA run on engagement markers revealed no significant main effect of discipline, F (2, 171) = 2.425, p = .091, η_p^2 = .028, but a significant effect of paradigm, F (2, 171) = 3.404, p = .036, η_p^2 = .038. There was no significant discipline/paradigm interaction, F (4, 171) = 1.537, p = .194, η_p^2 = .035. Post hoc analyses showed the quantitative RAs (M = 2.66, SD = 1.82) did not differ significantly (p =.115) from the qualitative RAs (M = 2.04, SD = 1.56) in the use of engagement markers, but differed from the mixed methods RAs (M = 1.95, SD = 1.50)

at a marginal significance level ($p = .053$). There was no significant difference between the qualitative RAs and the mixed methods RAs in the use of engagement markers ($p = 1.000$).

As noted above, the engagement markers in this study were realized by a range of linguistic devices which fell into several functional subtypes, namely, directives (Example 175), reader references (Example 176), questions (Example 177), knowledge appeals (Example 178), as well as personal asides (Example 179).

(175) **See** Fig. 5 for the mean problem-solving scores and standard errors for each condition. (EDU/QUAN17)

(176) However, as **we** can see, inexperienced interpreters may be assigned for such a task. (APL/QUAL05)

(177) **Why were these parents so much more frustrated at lack of time to be together?** (PSY/MM03)

(178) **Of course**, the teacher has often to take care of more than 30 students in the same class, and cannot assess the initial strategies adopted by each student for a specific concept. (EDU/MM16)

(179) Larger scale but localized studies of research engagement can deepen understandings of how research is perceived in particular contexts and help promote more informed consideration of feasible forms of teacher research engagement in those contexts (**and I am very aware that in some contexts such engagement will be neither a priority nor feasible**). (APL/MM04)

As can be seen from Table 6.1, when compared with other interactional metadiscoursal features, the incidence of engagement markers was relatively low. Of the five subtypes of engagement markers, directives and reader references occurred relatively more frequently. Therefore I conducted quantitative analyses on these two subtypes only.

6.1.6.1 Directives

The ANOVA on directives showed a non-significant effect of discipline, F (2, 171) = 0.920, p = .400, η_p^2 = .011, but a significant effect of paradigm, F (2, 171) = 10.839, p = .001, η_p^2 = .113. There was also a significant interaction effect of discipline/paradigm, F (4, 171) = 4.525, p = .002, η_p^2 = .096. The interaction occurred because the effect of paradigm was mediated by that of discipline. In both the psychology and the education RAs, there was a sharp contrast in the use of directives between the quantitative RAs on the one hand, and the qualitative as well as the mixed methods RAs on the other, but there was little difference across the three paradigms in the applied linguistics RAs. Post hoc analyses showed that that the quantitative RAs (M = 1.70, SD = 1.48) used significantly more directives than both the qualitative RAs (M = 0.87, SD = 0.78) and the mixed methods RAs (M = 1.02, SD = 0.85) (p < .001 and p = .001 respectively). The latter two subcorpora did not differ significantly in the use of directives (p =1.000).

Directives in the present corpus were mainly realized by such grammatical structures as imperatives, deontic modal verbs explicitly addressed to readers, and *it*-clauses, as illustrated by the following examples.

(180) **Note** that in the transcript, C stands for the coach and P for an anonymous player. (EDU/QUAL11)

(181) This study includes potential limitations that readers **should** take into account when interpreting the findings. (PSY/QUAN05)

(182) Thus, in analyzing the data on those topics, **it is important to look at** the number of years each participant had spent in the United States rather than at the amount of her daily exposure to Russian. (APL/MM09)

Following Hyland (2001a, 2002c), I classified directives into those oriented to

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textual acts, physical acts, and cognitive acts according to their discourse functions in the texts. The textual acts directed readers to textual information (Example 183); the physical acts directed readers to certain actions in either intertextual sources (Example 184) or the research world (Example 185); and the cognitive acts directed readers to make the same inferences as the writers through mental activities (Example 186).

(183) Over time, Dan was introduced to more ideas about instructional coaching (**see** Table 1) (EDU/QUAL05)

(184) For example, a dictogloss task involves collective reconstruction of a text that contains forms known to be difficult for students (**cf.** Swain, 1998). (APL/QUAL16)

(185) **Ask** about animal abuse as a routine part of the initial intake or assessment with all clients who present for therapy. (PSY/QUAN16)

(186) To illustrate how these proportions are calculated, **consider** the example standards and assessment data shown in Figure 3. (EDU/QUAN13)

Table 6.7 shows the distribution of the different types of directives across the paradigms. Whereas the use of physical and cognitive acts was largely similar across the different paradigms, the quantitative RAs appeared to use more textual acts than the qualitative and the mixed methods RAs.

Table 6.7

Types of Directives by Paradigm

Function	Quantitative		Qualitative		Mixed methods	
	Raw	Per 1000 words	Raw	Per 1000 Words	Raw	Per 1000 Words
Textual acts	227	1.04	160	0.47	194	0.65
Physical acts	20	0.09	20	0.06	9	0.03
Cognitive acts	84	0.39	99	0.29	102	0.34
Total	331	1.52	279	0.82	305	1.03

A detailed analysis of the textual acts revealed that the imperative *see* predominated the use of directives and functioned typically in two ways (cf. Swales et al., 1998): intertextually directing readers to other texts for further information (Example 187) or intratextually referring them to visual displays (Example 188) or other parts of the same text (Example 189). In terms of relative frequencies, a noteworthy cross-paradigmatic difference in the use of imperative *see* was found between the quantitative RAs, which used more directives to refer readers to visual displays such as tables, figures, appendix, and the qualitative RAs.

(187) Although a detailed exploration of these constraints is beyond the scope of this article, I do wish to offer a few considerations (also **see** Ashcraft, 2002, 2006). (EDU/QUAL01)

(188) Simply, our results can be seen along a continuum (**see** Figure 1). (PSY/QUAN09)

(189) Pre-microgenesis activity normally entails organisational talk and an awareness /consciousness stage, leading to microgenesis affordance (**see** below). (APL/QUAL07)

As a subtype of engagement markers, directives may be a risky rhetorical strategy because while they can help RA writers to align readers with their own positions, the use of directives may also bring imposition upon readers and threaten their negative face (Hyland, 2002c). In comparison, reader references appeared to be less imposing to readers and were also frequently used by the RAs writers to create an effect of reader-writer solidarity.

6.1.6.2 Reader references

The ANOVA run on reader references yielded a significant main effect of

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discipline, F (2, 171) = 9.343, p = .001, η_p^2 = .099, but no significant effect of paradigm, F (2, 171) = 0.534, p = .587, η_p^2 = .006. No significant interaction between paradigm and discipline was found, F (4, 171) = 0.409, p = .802, η_p^2 = .009. Post hoc analyses showed that the applied linguistics RAs (M = 0.94, SD = 1.06) used significantly ($p < .001$) more frequent reader references than the psychology RAs (M = 0.31, SD = 0.46), but did not differ (p =.146) from the education RAs (M = 0.65, SD = 0.73). The latter two subcorpora did not differ from each other in the use of reader references (p =.063). These patterns can be seen in Figure 6.2.

The analyses of the reader references in the present study revealed that this type of engagement markers was realized by the inclusive first-person pronoun *we*, *us*, and the determiner *our*, as well as the second-person pronoun *you* and the determiner *your*. The indefinite pronoun *one* and the noun *reader(s)* were also used to address readers. As Table 6.8 shows, the inclusive *we* and *our* were the most frequently used reader references, followed by the indefinite pronoun *one*. The second-pronouns *you* and *your* and the noun *reader* only occasionally occurred in the corpus. A noteworthy cross-disciplinary difference was that the applied linguistics RAs used the inclusive *we* and *our* more than six times as frequently as the psychology RAs.

Table 6.8

Types of Reader References by Discipline

Reader reference	Applied Linguistics		Education		Psychology	
	Raw	Per 1000 words	Raw	Per 1000 words	Raw	Per 1000 words
we	170	0.61	127	0.40	24	0.09
our	28	0.10	25	0.08	19	0.07
you/your	0	0.00	3	0.01	9	0.04
one	57	0.20	57	0.18	19	0.07
reader(s)	6	0.02	0	0.00	2	0.01
Total	261	0.93	217	0.67	73	0.29

Qualitative analyses of the functions of the inclusive *we* in the corpus indicated that it was used for three different purposes: guiding the reader through discourse, aligning the reader with an intended interpretation, and recruiting the reader to take concerted actions. Firstly, the inclusive *we* was found to occur frequently with frame markers (e.g., *will, now*) in the post-method RA sections, functioning as a discourse guide and helping readers to navigate through the text (see also Harwood, 2005b), as illustrated below (Examples 190 and 191).

(190) In this section **we** will analyse the types of assistance encountered in the microgenesis instances and the mediational mechanisms that support the creation of assistance. (APL/QUAL07)

(191) Now that **we** know more about the individual in- and out-degree measures and interactions patterns of this NLC, **we** can start to look at their teaching and learning activities (see Table 5). (EDU/QUAL09)

Another important function of the inclusive *we* was to align readers with the writer's position in interpreting data or constructing arguments. As illustrated by Examples 192 and 193, the phrase *we can see* was frequently used to indicate that the ensuing observation or claim was arrived at by both the writer and the readers.

(192) In Example 7b **we** can see how the player (P) reproduces the same comment during another scene on the following day. (APL/QUAL15)

(193) As **we** can see in the transcript, how Kay talks about her understandings of UHIs and to whom this expertise is shared differs from school science talk. (EDU/QUAL10)

Thirdly, the inclusive *we* was also employed to construct readers as informed discourse participants in the RAs. In the post-method RA sections, the inclusive *we* was often used by the writers to stress the solidarity with disciplinary readers in

acknowledging limitations of research (Example 194), drawing practical implications (Example 195), and anticipating further research (Example 196) , as exemplified in the following:

(194) In drawing conclusions, **we** must also recognize some limitations of this research. (EDU/QUAL19)

(195) As professional psychologists, **we** first need to be aware of military enlistment as a potentially significant family context for anyone seeking psychological services. (PSY/QUAL14)

(196) Clearly, **we** must keep exploring this question by investigating knowledge of gender agreement (APL/QUAN08)

Compared with the inclusive *we*, the indefinite pronoun *one* was less frequently used in the present study. However, an important discourse function of this reader reference was to evoke the "hypothetical-real" pattern of interaction with readers (Thompson, 2001, p.63). In other words, to argue against or dismiss a hypothetical position or view, the writer entertained the hypothesis that someone might temporarily hold a particular view, and then rejected it. Typically, this discourse function was associated with other metadiscoursal features like hedges (e.g., *might*, *could*) and comparative transitions (e.g., *instead*, *however*), as shown in the following examples.

(197) Accordingly, **one** might have hypothesized a stronger correlation for the overall less proficient first-year learners, who can be expected to be more dependent on metalinguistic knowledge than their more advanced fourth-year colleagues. Instead, the opposite was found. (APL/QUAN04)

(198) Again, **one** might argue that although Mr. Thompson appropriated the rhetoric of open questions and interpretive reading, his enactment of these ideas belied a misunderstanding of them, evidenced by his suppression of

open questions throughout the lesson. <u>However</u>, this line of reasoning raises further problems (EDU/QUAL08)

(199) **One** <u>could</u> argue that the deficit in selective attention is also due to dysfunctional perceptual organization. Indeed, there is some evidence that the way stimuli are organized at the perceptual level can be a determinant of memory capacity … <u>However</u>, in the current study, the TBI items (spoken in a male voice) were easily distinguishable from the TBR items (spoken in a female voice); therefore, the dysfunctional selection of information could not be located at the perceptual level. (PSY/QUAN04)

To conclude, through the frequent use of various reader references such as those exemplified in this section, the RA writers in all the three disciplines explicitly brought readers into the texts where research results were presented and knowledge claims were negotiated. Overall, the applied linguistics RAs displayed more explicit reader involvement and collaboration than the psychology RAs, particularly in the use of the inclusive *we* and the indefinite reader pronoun *one*. This finding is comparable to Hyland's (2001a) study, which found that soft disciplines such as applied linguistics tended to employ more reader references (about 1.9 per thousand words) to engage their readers than other natural science disciplines.

6.1.6.3 Questions

Similar to reader references, asking questions is also one important interactional strategy in academic writing (Thompson, 2001). While I did not perform any statistical analysis on the use of questions due to their lower incidence in the corpus, the relative frequencies indicated that the applied linguistics (0.30 per thousand words) and the education RAs (0.28 per thousand words) used more questions than the psychology RAs (0.10 per thousand words). Although previous research has found

more questions were used in soft disciplines (e.g. Hyland, 2001a; Hyland, 2002d), the relative difference between individual social science disciplines need to be   verified by further research,

Following Hyland (2002d) and Crawford Camiciottoli (2004), I analyzed the discourse functions of questions through examining the contexts in which they occurred. While Hyland (2002d) discovered that questions in RAs, textbooks, and student project reports fulfilled different purposes ranging from getting readers' attention to setting up claims, Crawford Camiciottoli (2008) distinguished the functions of questions in spoken lectures and written instructional materials. In the present study, a closer look at the corpus data indicated that the questions were used for four major discourse functions in the post-method RA sections: *framing information*, *prompting reflection*, *anticipating research*, and *citing examples*. Whereas instances of the first three functions were also found by Hyland (2002d) or Crawford Camiciottoli (2008) in their studies, the last function emerged from my own data. *Framing information* refers to the use of questions to introduce new information into the discourse. This function enabled the RA writers to organize textual content and guide readers to new information in the post-method RA sections (Examples 200 and 201). *Prompting reflection* involves raising questions with or without providing an immediate answer so as to involve readers in reflecting on the questions under discussion (Example 202). In this corpus, *anticipating research* usually occurred in the concluding sections, where the RA writers used questions to direct readers to pursue directions for further research (Example 203). Finally, the RAs writers also used questions to exemplify a point or a claim in the text, that is, *citing examples*

(Example 204).

> (200) **To what might classroom interactional genres owe their durability**? In what follows, I discuss three factors: pupil collusion, habitus, and framing. (EDU/QUAL08)
>
> (201) **Why were these parents so much more frustrated at lack of time to be together**? One reason…another… (PSY/MM03)
>
> (202) Of course, it is the business of language teachers to correct errors. **But how is error defined**? (APL/QUAL11)
>
> (203) This leads to other questions: **Would those increased pauses correlate with better reading recall and/or comprehension of complex L2 texts**? In the same vein, **does the use of L2 literary sources—with their variety of complex structures—encourage the development of effective L2 reading strategies**?   (APL/QUAN10)
>
> (204) Another key factor is accuracy, meaning whether tutors' evaluations are predictive of their knowledge of particular concepts. These data would allow us to better assess peer tutors' self-monitoring quality. **Are peer tutors indeed overconfident in their domain knowledge**? **Are their self-evaluations more or less accurate than learners in non-tutoring settings**?   (EDU/MM17)

To summarize, the finding of this study indicated that questions were important engagement resources in the RAs in all three disciplines examined. To interact with the imagined as well as the real readers, the RAs writer raised questions which fulfilled a number of functions and which ultimately aimed to persuade readers into accepting their arguments.

6.1.6.4 Knowledge appeals

Knowledge appeals were another type of engagement markers used by the RA writers in this study to create shared understanding with disciplinary readers. It should

be noted that due to the extremely low incidence of knowledge appeals in my corpus, it was impossible to formulate hypotheses about any patterns on the basis of their relative frequencies in the different subcorpora. However, the majority of these features indeed occurred in the applied linguistics and the education RAs rather than the psychology RAs, which seemed to be consistent with the patterns found for reader references and questions. In the corpus, knowledge appeals were most frequently realized by the adverbial phrase *of course* as well as the clause *it is well known*. While these grammatical devices could also be used to indicate the writers' stance such as epistemic certainty (Hyland, 2001a) or attitude (McGrath & Kuteeva, 2012), they were more explicitly used to stress solidarity with the imagined readers on the basis of shared background knowledge, such as common methodological assumptions (Example 205), disciplinary knowledge (Example 206), and interpretation norms (Example 207).

(205) It was predicted (Hypothesis 5) that no relation would be found between the Discrepant Claims Epistemological assessment task and the Discipline-Focused Epistemological Beliefs questionnaires. **Of course**, what was actually tested in the statistical analysis is that there was a relationship between the two. (EDU/QUAN20)

(206) **It is well known** that NSs of English tend to use low pitch levels accompanied by longer pauses at topic-final boundaries, whereas they use high pitch levels at the initiation of a new topic and use middle levels at points of continuation (Nakajima & Allen, 1993). (APL/QUAN13)

(207) The findings reported in this article, **of course**, need to be interpreted with caution because the number of participants was relatively small.(APL/QUAL19)

By appealing to shared understanding, the RA writers involved disciplinary

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readers as intelligent, equal discourse participants in the construction of knowledge. Consequently, knowledge appeals not only facilitated the RA writers' efforts to solicit readers' collaboration in discourse development but also demonstrated their own familiarity with disciplinary practices as insiders.

6.1.6.5 Personal asides

According to Hyland (2001a, 2005c), personal asides typically occur in RAs where a writer directly addresses the reader by intervening in the unfolding text and comment on an aspect of the issue under discussion. Perhaps due to their interruptive nature, personal asides were sparingly used by the RA writers in this corpus, as similarly found in previous studies (Hyland, 2001a, 2005c; McGrath & Kuteeva, 2012). Again, it was impossible for me to identify any cross-disciplinary or cross-paradigmatic patterns due to the low incidence of this subtype of engagement markers. The majority of personal asides found in the corpus were marked by parentheses or dashes, signaling a breaking-off from the flow of main discourse. A close examination of the content and the function of the asides in specific contexts suggested that this type of engagement markers was typically used to offer additional information to a previous discourse unit, such as explaining the use of methodological procedure (Example 208), guiding readers in locating information (Example 209), offering interactional opportunities (Example 210), or providing a rationale for textual organization (Example 211), as illustrated in the following. The relevant parts in each example are underlined.

(208) A chi-square analysis of therapist immediacy and subsequent client behavior (**beginning with any time the therapist had an immediacy**

statement in a speaking turn), was significant, χ 2(88) = 123.68, p < .001, indicating that the two sets of behaviors were related. (PSY/MM04)

(209) At the same time, however, expanding the reach of these efforts is also important for increasing public awareness of their academic and democratic benefits—**a point I will return to in a moment**. (EDU/QUAL01)

(210) Also, some of the sections of this report provide descriptive summaries for each of the survey categories and the specific answers given by respondents were not included. (**More specific answers or detailed tables with percentage data can be obtained from the first author**.) (PSY/MM09)

(211) In conclusion, it appears that several mechanisms were central here: (a) …; (b) …; (c) …; and (d) … Similar processes occurred in the collaborative (correct) solution of items 7 and 9. **We are fully aware of the limited scope of the above protocol in spite of the reasons we gave for its representativeness. To keep the present paper to a reasonable length, we do not present other instructive protocols**. (EDU/MM16)

As exemplified above, while the use of personal asides may have interrupted the flow of argument, it is an important rhetorical strategy to build solidarity with readers. Compared with directives, personal asides appeared to be less face-threatening and could shorten the distance between the writer and the reader. While Hyland (2001a, 2005c) suggests that this feature is more characteristic of the soft disciplines in comparison with the hard disciplines, more research is needed to ascertain whether it varies across different social science disciplinary contexts.

6.2. Discussion

6.2.1 Summary of the findings

In summary, my quantitative analyses indicated that there were clear variations between the different disciplines and the research paradigms in the use of different types and subtypes of interactional metadiscourse. Table 6.9 provides a summary of

all the significant differences identified across the disciplines and paradigms. Cross-disciplinarily, while no disciplinary differences were found in the use of hedges and attitude markers, the use of boosters, self-mentions, and reader references showed a clear contrast between the psychology RAs on one hand, and the applied linguistics and/or the education RAs on the other. Specifically, both the education and the applied linguistics RAs used boosters significantly more frequently than the psychology RAs. Furthermore, where self-mentions occurred significantly less frequently in the applied linguistics RAs than in the psychology RAs, reader references were used significantly more frequently in the former than in the latter. These patterns are illustrated in Figure 6.1.

Table 6.9

Summary of Statistically Significant Comparisons in the Use of Interactional

Metadiscourse across the Disciplines and the Paradigms

Type and subtype	Cross-disciplinary difference	Cross-paradigmatic difference	Discipline/Paradigm interaction
Hedges	No	QUAN > QUAL QUAN > MM MM> QUAL	No
Boosters	EDU > PSY APL > PSY	QUAN > QUAL MM>QUAL	No
Attitude markers	No	QUAN > QUAL	No
Self-mentions	PSY > APL	No	No
Engagement markers	No	QUAN > MM	No
Directives	No	QUAN > QUAL QUAN >MM	Yes
Reader references	APL > PSY	No	No
Questions	---	---	---
Knowledge appeals	---	---	---
Personal asides	---	---	---
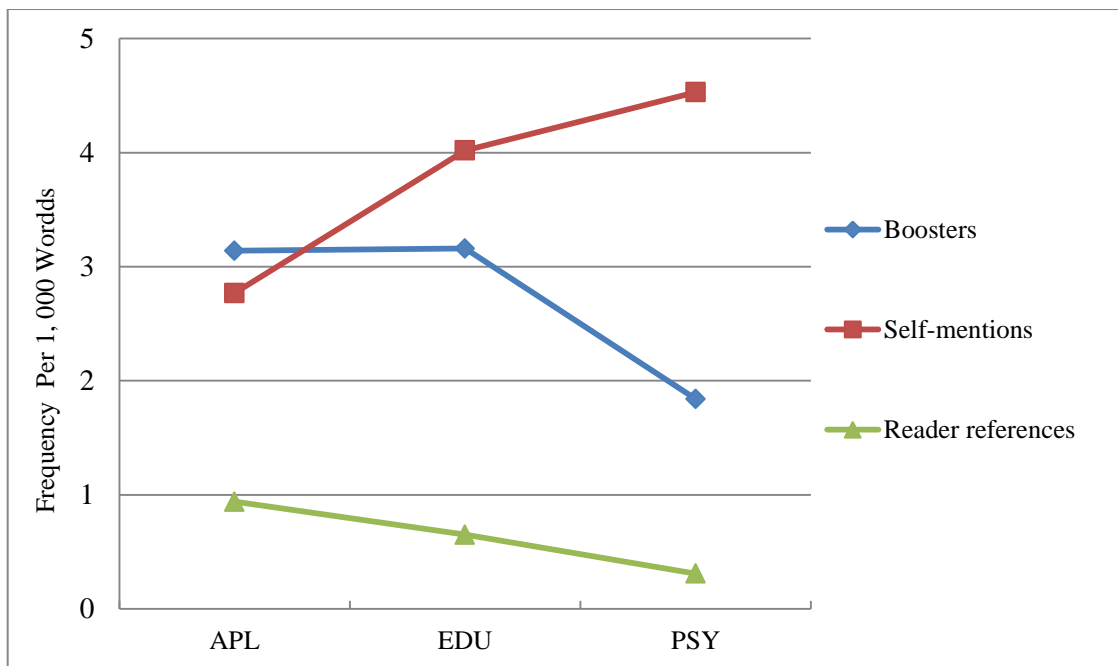
Figure 6.1 Mean Frequencies of statistically significant comparisons in the use of interactional metadiscourse across the disciplines

According to Table 6.9, cross-paradigmatic differences can be most clearly seen between the quantitative and the qualitative RAs. Specifically, the use of hedges, boosters, attitude markers, and directives showed a significantly higher incidence in the quantitative RAs than in the qualitative RAs. In addition, the mixed methods RAs differed from either the quantitative RAs or the qualitative RAs with respect to different types or subtypes of interactional metadiscourse. On one hand, the quantitative RAs used the subtypes of hedges and directives significantly more frequently than the mixed methods RAs. On the other hand, the overall frequencies of hedges and boosters were significantly higher in the mixed methods RAs than in the qualitative RAs. Figure 6.2 illustrated these patterns clearly.
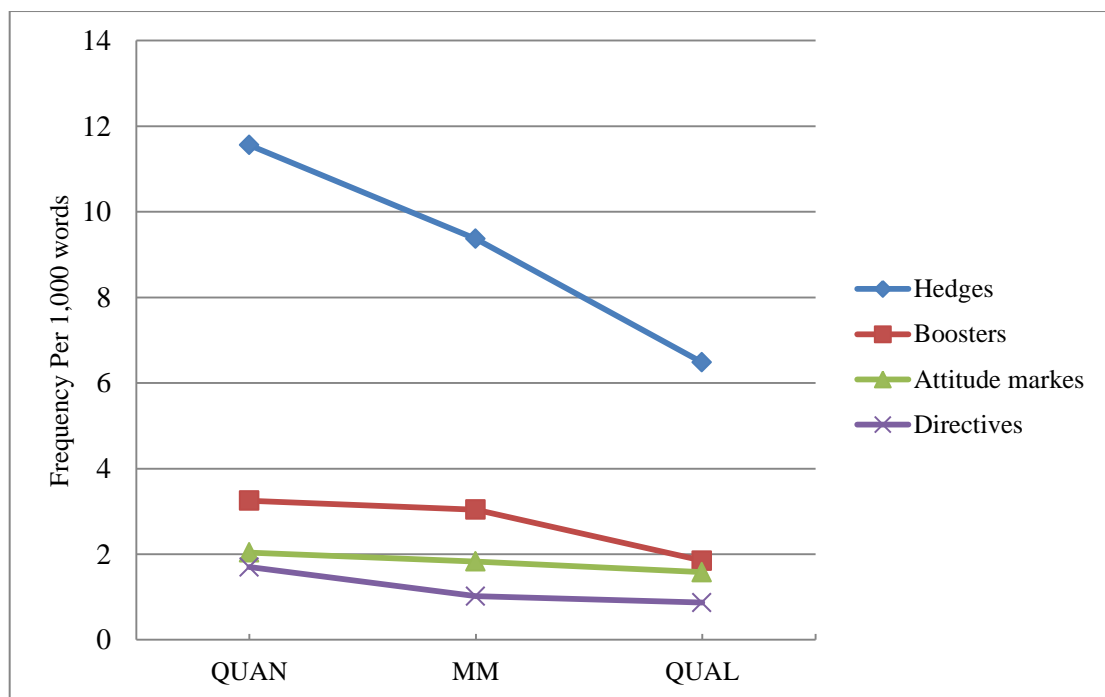
Figure 6.2 Mean Frequencies of statistically significant comparisons in the use of interactional metadiscourse across the paradigms

6.2.2 Disciplinary influences on the use of interactional metadiscourse

As reported in the previous section, this study found clear cross-disciplinary differences in the use of boosters, self-mentions, and reader references between the applied linguistics RAs and the psychology RAs. Specifically, the applied linguistics subcorpus deployed boosters and reader references more frequently than the psychology subcorpus, but the latter used more self-mentions than the former. An additional cross-disciplinary difference was between the education and the psychology subcorproa. The former used markedly more boosters than the latter. These cross-disciplinary variations in interactional metadiscourse can be linked to the knowledge-knower structures prevailing in each of these disciplines and their respective languages of legitimation (Maton, 2000, 2007, 2010a, 2010b, 2014).

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Because these theoretical notions were presented in Section 3.1 and summarized in Section 5.2.2, only a few key points are recapitalized below to frame my discussion.

As noted earlier, by adding knower structures to Bernstein's (1999) knowledge structures, Maton (2007, 2010a, 2014) has proposed that knowledge in different disciplines is legitimated by a configuration of knowledge-knower structures. The natural sciences and the humanities can be characterized by a hierarchical knowledge-horizontal knower structure (knowledge code) and a structure of horizontal knowledge-hierarchical knower (knower code) respectively. Although all three disciplines examined in this study occupy the middle range of the continuum of knowledge-knower structure, I propose to position applied linguistics and education towards the knower code and psychology towards the knowledge code respectively. Against this background, the cross-disciplinary variations in the use of interactional metadiscourse discovered in this study can be plausibly accounted for.

Firstly, the more frequent use of boosters in the applied linguistics and the education RAs is largely consistent with previous research on the use of boosters in soft fields including applied linguistics and education (Rabab'ah, 2013; Hyland, 1998a; Peacock, 2006). Such patterns of boosters appear to cohere well with the knower code characteristic of soft disciplines. In the knower code, which is dominated by a stronger social relation and a weaker epistemic relation, knowledge claims are legitimated by "reference to the knower's subjective or inter-subjective attributes and personal experiences" (Maton, 2010a, p.47). In other words, the 'truth' of a disciplinary field predominated by the knower code is defined by the 'voice' of a privileged knower rather than specialized procedures (Maton, 2010a, 2010b). In the

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RAs of such disciplines as applied linguistics and education, the writers try to persuade by using language to stress their individual authority and expertise. Through increasing their commitment to knowledge claims and asserting their authority by the frequent use of boosters, the RA writers in the applied linguistics and the education subcorpora were able to represent themselves as privileged knowers in their own disciplinary fields. In contrast, psychology as an intellectual field shows a stronger orientation towards the knowledge code in its knowledge-making practices. Thus, its knowledge claims are more likely to be legitimated by "reference to specialized procedures which are claimed to provide insight into a specified, discrete object of study" (Maton, 2010a, p.46). That is, legitimating knowledge claims in psychology depends on the use of explicit methods and procedures of inquiry to achieve specific, well-defined empirical objectives. The personal authority of the knower seems less relevant in the knowledge code because every knower is "equally positioned in relation to the knowledge and practices of the field and (it is claimed) anyone can produce knowledge provided they comply with these defining extra-personal practices" (Maton, 2010a, p.46). As a result, there may be less need for psychology writers to boost their knowledge claims in RAs, hence the lower incidence of boosters in the psychology subcorpus.

On the surface, the more frequent use of self-mentions, particularly the exclusive *we* and *our*, in the psychology RAs than in the applied linguistics RAs, appears to contradict the underlying principles of the knowledge code. However, a historical review of the writing styles and guides in psychology (Bazerman, 1988) and a survey of the preferences of psychology journal editors (Polyson, Levinson, & Miller, 1982)

indicate that the use of self-mentions in psychology has been shaped by complex factors. First, the influence of writing guides such as the *Publication Manual of the American Psychological Association* on the language used for reporting empirical research cannot be overestimated (Madigan et al, 1995). During the few decades after the first appearance of APA style sheets in 1920s, as Bazerman (1988) points out, the *Publication Manual* becomes increasingly more prescriptive under the growing influence of behaviorism. The role of the writer, according to Bazerman (1988), was a "doer of experiments, maker of calculations, and presenter of results" and he or she did not need to "reason through an intellectual or theoretical problem to justify or design an experiment, nor in most cases [did] he or she need to identify and take positions on arguments in literature" (p. 272). This downplay of writer agency clearly reflected a knowledge code where personal authority has to give way to specialized procedures (Maton, 2010a). However, research writing is "no unitary and unchanging thing" (Bazerman, 1988, p.258). The development of humanistic psychology which proposes to understand individuals by using their cognitive and emotional experience, as well as the growing awareness of researchers' influence on the research process, encouraged the use of the first-person self-mentions in mainstream psychology journals (Polyson et al., 1982). In a questionnaire survey among North American senior editors of 100 top psychology journals, Polyson et al. (1982) found that about half of them preferred first-person self-references, and around one third preferred third-person self-references. The survey also showed that whereas the editors from the subfield of counseling psychology equally supported the use of first-person and the third-person writing styles, those in psychotherapy clearly leaned towards the

first-person usage (Polyson et al., 1982). Such preferences for self-mentions were supported by the findings about the psychology subcorpus in this study, which comprised RAs from journals in the subfields of counseling and clinical psychology. The use of self-mentions is also encouraged in the latest edition of the APA *Publication Manual* because "an experiment cannot *attempt to demonstrate*, *control unwanted variables*, or *interpret findings*, nor can tables or figures *compare*" (American Psychological Association, 2010, p.69, original emphasis). However, it should be noted that preferences for the first-person pronouns among journal editors and in the APA manuals cannot be seen as a shift towards the knower code of knowledge production. With its strong prescriptive power, the APA writing style implies the knowledge code, since it represents "a utilitarian view of language in which words are implicitly assumed to function as simple transmitters of information from the writer to the reader" (Madigan et al., 1995, p.433). Further, the dominance of the knowledge code in psychology is also reflected in the prevalence of (post)positivism and quantitative research despite a growing appearance of qualitative publications in recent years (Harper, 2008; Rennie et al, 2002). Interestingly, my psychology informants from both qualitative and quantitative research paradigms disapproved the use of first-person pronouns in writing, which was suggestive of the influence of the knowledge code in the discipline. For example, when asked what factors might have affected her use of first-person pronouns, PSY1, a qualitative psychologist, mentioned the influence from journals and disciplinary conventions.

> Journal is definitely a factor, and what's the standard, what's the convention, because it is so competitive to get a research paper published. If you violate the standard, you risk the rejection. So it's not usually worth it to risk violating

a standard. So I'll be more likely to put it in a third person… and I might just put the whole thing in the third person just to stick with the convention. (PSY1/QUAL)

PSY2, as primarily a quantitative researcher, similarly expressed her avoidance of self-mentions in her writing, and she attributed her writing style to her professional training.

> I mean it seems that it was how I was trained in writing research articles. I don't know from where I learnt about this but it's a better idea to stay away from the first-person pronouns, because that actually will make the article sound less formal. I think it's just some kind of message that has been conveyed to me before, so which, I guess, results in my writing to be more impersonal, especially when reporting results, you know, just say, what is done instead of saying 'I did this' cause that kind of language may be a little less formal in the way I have been taught. (PSY2/QUAN)

It is worth noting that despite her reported adherence to the third-person writing style in psychology, PSY1 was aware of the changing rhetorical conventions, and admitted that the use of self-mention is acceptable.

> It's a standard in the discipline of psychology to use the third person, generally. So it's a convention, I think. But that's changing, I think also. …I do use, you know, 'I', 'me', and 'my'. But I think it is more so in later papers. (PSY1/QUAL)

The author-evacuated textual convention does not seem unique to psychology. My informants from the other two disciplinary fields have voiced similar viewpoints on the use of self-mentions: while all acknowledged that the suppression of the explicit authorial presence in writing was part of the disciplinary conventions, they also agreed that such conventions have been in the process of change. For example,

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EDU1, an educational researcher, replied when asked about the lack of self-mentions in her text:

> So [these are] conventions of research, you know. I think it was at a time when things were starting to change. And there are certainly many many researchers who were using "I" already at the time. But I think most people didn't. (EDU1/QUAL)

In a similar vein, APL1 admitted that it may be a convention for many quantitative-oriented fields to avoid self-reference but otherwise for qualitative research.

> So in many cognitive and quantitative fields, the role of the researcher, the individual is hidden. It's always there. But you have to dig very hard to get at it. … But in qualitative research, you do. You want to say: Look, we are looking at human interaction, we are looking at social behavior and I am a person, just like the person I have been studying. So I want to tell you a little bit about myself. When I get my students to write their dissertations, if they are doing the dissertations on qualitative aspects, I always ask them in the first chapter to tell me who they are, why you are doing this, why you are interested in this. (APL1/QUAL)

In short, it seems that most of my informants have recognized that there are certain conventions relating to the use of self-mentions in academic writing and minimizing the role of the researcher or author may be necessary to stick to those conventions. However, such conventions are under change and the use of self-mentions has become more acceptable, particularly in qualitative research.

Finally, as was the case with boosters, the dominating knower code in applied linguistics can account for the more frequent use of reader references in the applied linguistics than in the psychology RAs. Knowledge claims in the knower code can not only be legitimated by asserting the knower's authority by using boosters but also

depend on the rapport built up between writer and reader from the disciplinary community by using other metadiscoursal resources, particularly reader references. The solidarity between writer and reader is of importance to the knower code because the legitimation of the writer's knowledge claims needs the approval from his/her reader. Thus, the frequent deployment of reader references such as the inclusive *we* in the applied linguistics RAs helps writer to "predict and respond to their readers' line of thought", and "encourage particular reactions to their argument" (Hyland, 2001a, p. 558). As illustrated in Examples 190, 192, and 196 in Section 6.1.6.2, RA writers in applied linguistics tended to stress the shared community membership with readers in order to lead readers towards their preferred conclusions. By contrast, psychology is dominated by the knowledge code, where claims to knowledge are legitimated by appropriately applied procedures and methods (Maton, 2007, 2010a). Consequently, there are probably less opportunities in psychology RAs to invoke such rapport-building metadiscoursal devices as reader references.

6.2.2 Paradigmatic influences on the use of interactional metadiscourse

As reported earlier, the corpus analyses found clear variations among the quantitative, the qualitative, and the mixed methods RAs in the use of interactional metadiscourse. In what follows, I discuss these paradigmatic differences in the use of each main type and subtype of interactional metadiscourse, in terms of the different epistemological assumptions undergirding the three paradigms. Where it is relevant, the interview data are drawn on to support my discussion.

To begin with, the varying frequencies of hedges between the quantitative and the qualitative RAs are largely consistent with Hansen's (1988) finding that where her

quantitative text assumed a more tentative authorial stance, when compared with her qualitative text. In the present corpus, the markedly higher incidence of hedges in the quantitative RAs also indicated a more speculative and tentative writer stance when compared with the qualitative RAs. This difference in writer stance can be explained by the contrasting assumptions about and approaches to causality in quantitative and qualitative research in the social sciences (Cohen et al., 2011; Firestone, 1987; Maxwell, 2004, 2012). For quantitative research, establishing causality between/among clearly defined variables is fundamental in uncovering universal, law-like generalizations about the social world, which is highly valued by (post)positivist epistemology (Cohen et al., 2011; Johnson & Christensen, 2012). To establish causality in the social sciences, quantitative research typically adopts an inductive-deductive approach and utilizes rigorously controlled procedures, methods and measurement tools to reduce complex human behaviors, attitudes, performances, and other attributes to numerical information and models the relationship mathematically. Because causality in the social world is often unobservable, asymmetrical, nonlinear, and unpredictable, it is difficult for quantitative researchers to identify the detailed dynamic workings of causal relations or to backtrack the causes of certain effects (Cohenet al., 2011).Thus causality in quantitative research can only be inferred rather than determined on the basis of statistical models (Russo, 2008). The "inferential, conjectural, and probabilistic" nature of such causal explanations (Cohen et al., 2011, p.56) creates a need for quantitative RA writers to use hedges to qualify their knowledge claims based on empirical results, negotiate alternative explanations, or speculate on potential research limitations. This may

account for the higher incidence of hedges in the quantitative RAs in the corpus.

While causality in quantitative research is based on regularity and variance, causality in qualitative research, by contrast, is focused on the actual process of a situation (Firestone, 1987, Maxwell, 2004). Qualitative research, undergirded by various anti-positivist epistemologies (e.g., Lincoln & Guba, 1985), typically approaches the question of causality by using observation, interview, and other ethnographic methods which could "get inside the heads" of participants (Cohen et al., 2011, p.62). Thus a qualitative investigation into the process of causality aims to identify the actual processes that have brought forth specific outcomes in particular circumstances (Cohen et al., 2011; Maxwell, 2004) rather than the universal laws. Although such accounts of causality in qualitative research are not free from researchers' inferences and conjectures, they appear more 'authentic' because the causal processes are reported, identified and/or verified by research participants themselves (Cohen et al., 2011), in contrast to causality identified in probabilistic terms in quantitative research. Consequently, there is less need for qualitative researchers, as compared with their quantitative counterparts, to infer from statistical models. Instead, they appear less tentative about the particular causal processes discovered through in-depth analysis of qualitative data. Similarly, the qualitative RA writers in this corpus appeared to have firmer assurance in their causal explanations and feel less need to convey uncertainty in the post-method RA sections, which could explain the lower frequencies of hedges in the qualitative RAs.

As regards mixed methods research, it is typically viewed as a pragmatic approach to research which combines strengths of both quantitative and qualitative

research (Johnson & Christensen, 2012; Morgan, 2007, 2014). Therefore causality in mixed methods research is likely to share characteristics of the regularity view of causality on the one hand, and the process view of causality on the other. This may account for the results that although the mixed methods RAs employed markedly fewer hedges than the quantitative RAs, they still used significantly more hedges than the qualitative RAs. One possibility was that the qualitative components of the mixed methods RAs may have used fewer hedges in comparison with the pure quantitative RAs; however, the quantitative components of the mixed methods RAs may have used more hedges than the pure qualitative RAs. Such a pattern of usage appears to reflect both a variable-oriented and a process-oriented approach to causality in mixed methods research (Maxwell, 2004).

The relevant interview data suggested that in all paradigms, hedges appeared to be used most often to convey a degree of tentativeness and uncertainty. This was particularly salient in quantitative research, where my specialist informants reported probability, speculation and alternative explanations as the most salient reasons for hedging in their discourse. For example, one of my quantitative informants, EDU2, explained why she tended to qualify the knowledge claims in the discussion section of one quantitative RA of her own:

> Definitely not very certain at this point because… for the research usually we can never confirm something. There is always a possibility that these things may not be happening. Even when we reject the hypothesis, it's based on probability. So I will never say for sure. I leave the possibility that something else will happen. (EDU2/QUAN)

When probed further on her stance of uncertainty, EDU2 elaborated that there was always room for alternative explanation for a piece of result or data, which

refrained her from being fully committed to a predetermined position.

> But usually we will not say it is true. … when we reject the null hypothesis, it doesn't mean that we accept the alternative hypothesis. And it's just like when we are seeing the doctor, they will take the aspirin for you, they will say I didn't see anything abnormal, they will not say that everything is normal, because something is invisible. So that's why we always leave the possibility when we come to discussion. But when we describe the results, it's the thing we observe, then I'll be sure that this correlation is correlation. But what does this correlation mean? Its meaning could be explained in many ways. (EDU2/QUAN)

In applied linguistics, APL2, a quantitative researcher, was asked why he used speculative language in reporting an experimental study. He explained that the use of hedges in this particular RA was mainly motivated by a lack of certainty in coming up with explanations for the research findings:

> So the second part of the study is try to identify the source of this bias, or the source of this flagging. Why this item has shown to be more difficult for one group as opposed to another group based on the statistics although both groups of people have similar abilities? So then we look for the source. In most cases, the source cannot be identified very easily, the source of the difficulty. So because the source of the difficulty cannot be identified very easily, we have to be less certain about the coming up with explanations for the flagging or the differential item function. That's why you will find speculative language, more speculative language here than in some other papers that I have written where I have much more, I have a feeling that 'Okay, this is what is happening or this is not what is happening'. So I use different language. So we alter the language, we, all writers do this in our papers. We alter our language to indicate levels of certainty. (APL2/QUAN)

Uncertainty was also listed as a major motivation behind the use of hedges in

qualitative RAs. Unlike quantitative research, however, uncertainty was reported as a result of being unable to generalize from the research findings, rather than on the basis of probability or alternative explanations. For example, one of my qualitative informants in education, EDU1, commented on her choice of hedges in her own writing.

> So aim with the small N, I would absolutely never say "this is true, this is the way it is, according to my findings". It would be like "this is how it seems", you know, "this is how it appears"....So there are two reasons to be tentative. One is you have a small N. But two is you are making a judgment about what other people are thinking. You cannot be absolutely certain about it. (EDU1/QUAL)

As EDU1 acknowledged that a "small N" was not adequate to guarantee a generalizable claim, APL1 corroborated her viewpoint by saying that he and his co-authors intended to limit their readers from generalizing from their finding:

> What we are saying there is, look, we are not making any generalizations. We are describing Paula's emotions. That's all. You know. So by saying "would not necessarily be true", all we are saying is: don't generalize from this. (APL1/QUAL)

In summary, both the quantitative and qualitative specialist informants reported using hedges in their RAs as a way to convey a degree of uncertainty in making knowledge claims. There appear to be some differences between the two paradigms regarding the specific reasons given for hedging in discourse. While the quantitative researchers reported that they toned down claims mainly on the basis of probability, speculation, and existence of alternative positions, qualitative researchers reported to use hedge to avoid overgeneralization. These findings of researchers' perceptions of

uncertainty are reflective of Lewin's (2005) findings on RA authors' motivations in using hedges in their texts. In a survey administered to a group of 13 academics, Lewin (2005) asked the respondents to provide their motivation in using hedges, she found that most of his respondents "indicated that uncertainty was a more honest reflection of reality, by saying, for instance, 'not enough evidence' or 'to limit the generalization'" (pp. 169-170). While the interview findings reported here are comparable to those of Lewin (2005), given the limited number of interviews in this study, further research may be necessary to validate these interpretations.

Second, on the surface, the higher incidence of boosters in the quantitative than the qualitative RAs appeared to conflict with the results of cross-paradigmatic differences found in the use of hedges. This is because hedges and boosters typically work on the opposite sides of writer stance, with the former indicating the writer's uncertainty and tentativeness and the latter marking the writer's certainty and commitment. While the higher incidence of hedges in the quantitative RAs can be explained by the probabilistic nature of causality in quantitative research, why should the same quantitative RA writers use more boosters than their qualitative counterparts? This contradiction can be resolved by a closer examination of the specific use of boosters in the two subcorpora. As listed in Table 6.3, boosters used in the quantitative RAs were predominated by epistemic verbs such as *show*, *reveal*, *find*, and the modal verb *will*. These boosters, as Hyland (2005b, p.147) points out, are "more often expressed impersonally with more assertive claims largely restricted to specific experimental results, either suggesting the strength of the relationship between data and claims" or "expressing the certainty of expected outcomes." Such uses of boosters

seem to cohere well with the deductive approach of hypothesis-testing in quantitative research and, in essence, reflect the (post)positivist epistemology whereby causal relationships between variables are established and modeled by statistical tests. It appears that this type of boosting has been so successfully assimilated into quantitative research that some of my specialist informants admitted that they were either not aware of it or such use was just "clear" and "straightforward". For example, when asked why she used *show* in presenting her knowledge claim, PSY2, a quantitative researcher in psychology, replied that "I didn't really give a lot of thought into why I chose this word. Or I would also use *demonstrated*". It is clear that such rhetorical choice may have been long internalized by researchers such as PSY2 as a part of their disciplinary or paradigmatic discourse so that they may not have put serious thoughts about such usage. However, they might make some intuitive distinction between different rhetorical choices. For example, EDU2, a quantitative researcher in education, explained her choice of *show* and *find* in comparison with *suggest* by making a fine distinction between facts and inference:

> This is very clear; *find* and *show* express what the results are about straightforwardly. They are statements about facts. *Suggest* expresses what can be inferred from the results, but not what the results describe directly. For example, if we say "we find there is a positive correlation", we mean the correlation is positive. But this correlation 'suggests' something. So *suggest* is the inference, but it is not statistical but is the logical inference based on the statistical findings. (EDU2/QUAN)

On the other hand, because qualitative research focuses on local processes of causality as reported and identified by insiders instead of hypothesis-testing, there may be fewer opportunities for qualitative researchers to use such boosters in their

reports. In addition, the finding that the mixed methods RAs exhibited a higher incidence of boosters than the qualitative RAs is probably due to the possibility that the mixed methods RAs in this study shared more characteristics with the quantitative RAs than with the qualitative RAs.

Third, the more frequent use of attitude markers for expressing expectability and obligation in the quantitative RAs, as compared with those in the qualitative RAs, may be explained in terms of cross-paradigmatic differences in knowledge-making and accumulation. Knowledge-making in quantitative research primarily involves formulating hypotheses about causal relationships which are then put to empirical tests (Creswell, 2009; Cohen et al., 2011). These hypotheses are typically based on certain expectations of possible research outcomes. The actual results may turn out to be expected or unexpected, that is, to conform to or contradict the prior hypotheses. This may predispose quantitative researchers to comment on whether a particular result is expected or unexpected through the use of attitude markers (as illustrated by Examples from 122 to 124). This may account for the fact that the quantitative RAs deployed attitude markers more frequently to express the expectedness or unexpectedness, as compared with the qualitative RAs. Such uses of attitude markers were also confirmed by a quantitative informant from psychology.

> Here I was reporting findings related to the manipulation check of the study, which is where you wanna make sure that participants are actually doing what they are supposed to do. So in providing the intervention I expected people who have received intervention to actually engage in it. So that's why I said *as expected*. They reported that people who are assigned to mindfulness reported that they actually engage in it to a great extent. (PSY2/QUAN)

By contrast, knowledge in qualitative research is seen as local, interpretive, and socially constructed, whereas the practice of formulating hypotheses becomes irrelevant (Guba, 1990). Consequently, qualitative research generates knowledge by developing contextualized understandings rather than by testing hypotheses against actual outcomes. Such knowledge-making practices may result in fewer opportunities for using attitude markers of expectability in the qualitative RAs.

Furthermore, knowledge growth in quantitative research has been viewed as cumulative in nature (Greene, 1990). The accumulation of knowledge is through what Kuhn (1970) has termed "normal science" where every empirical study is focused on solving a specific puzzle. Ultimately, quantitative research aims to produce knowledge by abstraction and generalization (Cohen et al., 2011).Such an accumulative view of knowledge development may explain the finding that the quantitative RAs employed more knowledge obligations in prescribing further research, as illustrated in Examples 133 to135. On the other hand, knowledge produced in qualitative research is interpretive and grounded in specific contexts. In the spirit of the philosophy of constructivism, interpretive knowledge is not connected to "a priori theory" but to an "emergent problem" which "may or may not be informed by existing knowledge" (Greene, 1990, p.236). Thus it is not possible for qualitative research to accumulate knowledge hierarchically through generalization and abstraction. Consequently, there might have been fewer opportunities for the qualitative RAs, as compared with the quantitative RAs, to use knowledge obligations for prescribing specific directions for further research.

Fourth, it was found that the quantitative RAs made more frequent use of

engagement markers than the qualitative RAs, which was largely due to a similar cross-paradigmatic difference in the use of directives, a subtype of engagement markers that predominated in this type of interactional metadiscourse in the corpus. Again, this difference could be related to the different knowledge-making practices in quantitative research versus qualitative research. As noted earlier, quantitative research typically models causal relationship by using mathematical and statistical tools and measurements. Given that directives such as textual acts (e.g., *see*) and cognitive acts (e.g., *note*) have been found to be distinctive features of the languages of mathematics and statistics (e.g., McGrath & Kuteeva, 2012; Swales et al., 1998), it is not surprising that such directives also showed a higher incidence in the quantitative RAs. In addition, the greater occurrences of these directives may be attributed to the greater use in quantitative research of what is called "literary inscriptions" (Latour & Woolgar, 1986, p.51), that is, visual representations such as tables and figures (see Section 5.1.5.3 for non-linear references). One of my informants from education, EDU2, clearly articulated the motivation for using such directives in quantitative RAs.

> Usually we are quantitative, so it [the use of *see*] always refers to the tables or appendix. But sometimes I present in another way, for example, 'these results are presented in table 1', or sometimes if I want to change the flow of the sentence, I will describe something and then [use] 'see table 1". So we always draw people's attention to the results. (EDU2/QUAN)

By contrast, as mentioned before, qualitative research investigates causal relationships through a detailed description of contexts and processes where statistical modeling does not play any role. Further, a markedly lower incidence of visual displays such as tables and figures in quantitative RAs (see Section 5.1.5.3) may

reduce the opportunities for qualitative researchers to use such directives in qualitative RAs, as compared with their quantitative colleagues. Together, this may account for the lower frequencies of directives and engagement markers in the qualitative RAs in my corpus. As regards the cross-paradigmatic difference between the quantitative RAs and the mixed methods RAs, it may be that the latter shared more similarities with the qualitative RAs in the use of directives. That can also explain the cross-paradigmatic difference in the overall use of engagement makers.

6.3 Summary

This chapter reported that the use of interactional metadiscourse varied across both the disciplines and the research paradigms. Across the disciplines, a general contrast was found between the applied linguistics and the education RAs on one hand, and the psychology RAs on the other in the use of boosters, self-mentions, and reader references. Whereas the applied linguistics subcorpus used more boosters and reader references, the psychology subcorpus used more self-mentions. Further, the education subcorpus also used more boosters than the psychology subcorpus but did not differ from either of the two subcorpora in the use of other types of interactional metadiscourse. These cross-disciplinary differences have been explained in terms of the different knowledge-knower structures dominating in the three social science disciplines. Across the paradigms, the use of hedges, boosters, attitude markers, and directives was clearly more frequent in the quantitative RAs than in the qualitative RAs. The mixed methods RAs exhibited a hybrid nature, displaying both similarities with and differences from the other two subcorpora. These cross-paradigmatic differences have been accounted for by contrasting the opposing epistemological

assumptions and knowledge-making practices between quantitative and qualitative research, with respect to causality, hypothetic-deductive modeling and knowledge accumulation. The interviews with the specialist informants were drawn on to support my interpretation of the corpus-based results.

CHAPTER VII
CONCLUSION

This chapter concludes the whole thesis. I first revisit the research problem and research questions I started with in the PhD project. Next, I highlight the most important findings of the proposed study. Against the backdrop of these findings, I evaluate the significance of the study. Given the applied nature of this study, I will also discuss pedagogical implications of my findings for writing for publication, for teaching and learning of English for academic or specific purposes courses, and for curriculum and materials design. Finally, I discuss the limitations of the study and suggest directions for further research.

7.1 Research Problem Revisited

This study was inspired by previous research which has found that academic writing is a socio-cognitive product and is shaped by socio-cultural influences (Berkenkotter & Huckin, 1995; Hyland, 2000). A multitude of factors, such as discipline, culture, language, audience, have been found to impact on the writing styles and rhetorical conventions of academic texts (e.g., J. Flowerdew, 2002; Hyland, 2000; Hyland & Bondi, 2006). Some previous studies of academic writing have focused on the variation of disciplinary discourses and found stark contrast in the use of discursive strategies and resources in academic texts between soft and hard disciplines (e.g., Hyland, 2000, 2005b). However, the broad-brush differences between the sciences on one hand and the humanities and the social sciences on the other do not help us to understand how the hard disciplines or the soft ones might

differ within themselves in these respects. In addition, little research has explored how different research paradigms might affect academic writing, although knowledge creation is a paradigmatic-specific intellectual activity. To bridge these research gaps, this study has examined metadiscourse in RAs across three research paradigms and three soft disciplines. Metadiscourse is focused on because it constitutes an important rhetorical means for connecting the writer, the reader, and the text, and has been found to be integral to knowledge construction in academic texts (e.g., Hyland, 2005b, 2005c).

To recapitulate, the study has set out to compare the use of metadiscourse across both disciplines and research paradigms. Specifically, the study has addressed the four research questions put forward in Chapter 1, which were reproduced here for ease of reference.

1. What are the differences, if any, among the disciplines of applied linguistics, education, and psychology in the use of interactive metadiscourse in RAs?

2. What are the differences, if any, among the disciplines of applied linguistics, education, and psychology in the use of interactional metadiscourse in RAs?

3. What are the differences, if any, among quantitative, qualitative, and mixed methods research paradigms in the use of interactive metadiscourse in RAs across the three aforementioned disciplines?

4. What are the differences, if any, among quantitative, qualitative, and mixed methods research paradigms in the use of interactional metadiscourse in RAs across the three aforementioned disciplines?

In answering these research questions, this study has adopted a mixed methods

design consisting of both quantitative and qualitative data collection and analyses (Creswell, 2009). The primary data came from a specialized corpus of 180 post-method RA sections (about 0.85 million words) from three disciplines (i.e., applied linguistics, education, and psychology) and the three research paradigms (i.e., quantitative, qualitative, and mixed methods). As a supplement to the corpus data, interviews were conducted with six specialist informants (one quantitative and one qualitative researcher from each of the three disciplines). The interviews were semi-structured and the specialist informants were invited to talk around the use of metadiscourse in their own texts.

7.2 Key Research Findings

In the following sections, I summarize the respective key findings of cross-disciplinary and cross-paradigmatic comparisons of interactive metadiscourse and interactional metadiscourse.

7.2.1 Interactive metadiscourse

The corpus-based analyses found significant cross-disciplinary and cross-paradigmatic differences in the relative frequencies of different main types and subtypes of interactive metadiscourse.

With respect to cross-disciplinary differences, a broad contrast was found between the applied linguistics and education subcorpora and the psychology subcorpus. Several subtypes of interactive metadiscourse, for example, comparative transitions, linear and non-linear text references, as well as integral citations, were more frequently used in the applied linguistics RAs and/or the education RAs than in the psychology RAs. In contrast, other interactive metadiscoursal resources, namely,

exemplifiers and non-integral citations, occurred more frequently in the psychology RAs, as compared with those of the former two disciplines.

As regards cross-paradigmatic differences, the main contrast was found to exist between the quantitative and the qualitative RAs, whereas the mixed methods RAs aligned with the qualitative RAs in the use of most interactive resources. Specifically, the quantitative RAs used five subtypes of interactive metadiscourse more frequently than the qualitative RAs: reformulators, comparative and inferential transitions, sequencers, and non-linear references. In the meantime, the relative frequencies of reformulators, comparative transitions, and sequencers were also significantly higher in the quantitative RAs than in the mixed methods RAs.

7.2.2 Interactional metadiscourse

Similar to the observed patterns of interactive metadiscourse, the corpus-based analyses indicated both cross-disciplinary and cross-paradigmatic influences in the use of specific main types and subtypes of interactional metadiscourse.

With regard to cross-disciplinary differences, the incidence of boosters, self-mentions, and reader references varied among applied linguistics, education, and psychology subcorpora. Specifically, a clear contrast was found to exist between the applied linguistics RAs and the psychology RAs. Where the applied linguistics RAs used markedly more boosters than the psychology RAs, the latter used more self-mentions than the former. The education RAs appeared to take a middle position between the RAs of the other two disciplines. Where the education RAs employed significantly more boosters than the psychology RAs, they did not differ from either the applied linguistics RAs or the psychology RAs in the incidence of self-mentions

or reader references.

With regard to cross-paradigmatic differences, the incidence of hedges, boosters, attitude markers, and directives varied mainly between the quantitative and the qualitative RAs, with the mixed methods RAs taking a middle position. To be more specific, the quantitative RAs used hedges, boosters, attitude markers, and directives more frequently than the qualitative RAs. In addition, the mixed methods RAs used markedly fewer hedges and directives than the quantitative RAs but significantly more hedges and boosters than the qualitative RAs.

7.2.3 Summary

Based on the corpus analyses and taking into account the supplementary interview data, two general conclusions can be made in this study. The first general conclusion, as supported by the findings reported in Chapter 5 and Chapter 6, is that the use of metadiscourse varies within different social science disciplines, on top of the well-attested differences between soft and hard disciplines. Over the past decade, a great deal of research attention has been directed towards hard and soft disciplinary differences in a range of metadiscourse features (e.g., Hyland, 1998a, 1998b, 1999, 2000, 2002c 2005c; Lafuente-Millán, 2008, 2010; Peacock, 2006, 2010). It is only recently that the focus has started to shift to comparative studies within the broad knowledge domains of the humanities and the social sciences (e.g., Afros & Schryer, 2009; Khedri, et al., 2013). This study has built on and enriched this line of research by providing evidence of the nuanced differences between disciplinary discourses as a result of different knowledge-knower structures (Maton, 2000, 2007, 2010a, 2010b, 2014). In other words, the dominating knowledge structures and knower structures in

various social science disciplines may require discipline-specific use of metadiscourse.

Second, there appears to be a rhetorical connection between research paradigms in the social sciences and the use of metadiscourse in RAs produced within the different paradigms. Given that academic knowledge in a particular field is generated within the field's traditions and research paradigms (Khun,1970), assumptions about social reality and nature of knowledge that underlie a particular research paradigm may have shaped the specific methods used and the type of knowledge produced within that particular paradigm (Guba, 1990). To generate new knowledge and take credit for it, a researcher must persuade their colleagues who share the same paradigmatic assumptions to accept his/her knowledge claims. Thus, in knowledge construction and representation, academic writers must present their knowledge claims in accordance with those shared paradigmatic assumptions and knowledge-making practices. Since RAs constitute a most valued means of negotiating knowledge claims and transforming research findings into academic knowledge (Hyland, 2000), RA writers must deploy rhetorical means consistent with the paradigmatic assumptions and knowledge-making practices. Consequently, variations in the use of metadiscourse reflect the distinct discursive practices of different research paradigms.

Taken together, the results from the present study suggest that research paradigm, in addition to academic discipline, has important influences on the use of metadiscourse, especially interactional metadiscourse, in the post-method sections of RAs. Further, it appears that paradigm has a more pervasive influence on

metadiscourse than discipline does. The quantitative results reported in Chapters 5 and 6 have shown that the relative frequencies of the three main types of interactive metadiscourse (transitional markers, frame markers, and endophoric markers) and all main types of interactional markers except for self-mentions displayed significant variation across the research paradigms (see Table 5.2 and Table 6.9). In comparison, except for endophoric markers, boosters, and self-mentions, no other main types of interactive or interactional metadiscourse showed any statistically significant cross-disciplinary variation (see Table 5.2 and Table 6.9). Thus, although much previous research has shown that discipline is the most important factor in shaping the use of metadiscourse in RAs, this study indicates that paradigm may exert stronger impacts than discipline in metadiscourse use in academic writing.

7.3 Significance of the Study

While the significance of this study and its contribution to the existing knowledge base must be evaluated by its readers, several points are put forward for consideration here.

To begin with, arguably, the most important finding of this study is that metadiscourse, as a part of rhetorical resources of RAs, may be influenced by research paradigms, in addition to disciplines. Given that little published research in applied linguistics thus far has attempted to examine metadiscourse in RAs from the perspective of research paradigm, the empirical results of the present study in this regard can help to enrich our knowledge about the use of metadiscourse in academic writing. This study has explicated the possible relation between research paradigms, methodology of knowledge creation, and discourse of knowledge representation. In

general, paradigmatic assumptions and the methodologies may shape the knowledge produced as well as the rhetorical conventions used to represent that knowledge. The validity and usefulness of this connection have been preliminarily attested to by the findings from this study.

Second, based on the groundwork mostly done by Hyland (2000, 2005b, 2005c), I have developed and refined previous research on metadiscourse in several respects. For one thing, the analytical framework used in this study has addressed some previous challenges in conceptualizing and applying the idea of metadiscourse in academic contexts. For example, while Hyland's (2005a) functional model of metadiscourse may sometimes encounter difficulties in practice, particularly in relation to the distinction between propositional discourse and metadiscourse, the supplementary syntactic criteria I have proposed in this study may help clarify these difficulties in application. For another thing, while Hyland (2005a, pp.218-224) has listed a total of over 300 metadiscoursal items, this study has compiled a more comprehensive list of more than 900 metadiscoursal items that occurred at least once in the corpus (see Appendix II). This has enriched current findings on metadiscourse, particularly pertaining to RAs. In addition, this study manually identified and coded metadiscoursal items with the assistance of computer software. Many previous research (e.g., Hyland, 2005b, 2005c; Peacock, 2006) automatically searched metadiscourse according to a given list. In comparison, although manual coding is extremely time-consuming, it also can afford more opportunities to identify each potential metadiscourse in its specific context and may discover new metadiscourse features. For example, some non-linear metadiscourse, such as *episode*, *excerpt*,

extract, *quote*, and *vignette*, are newly discovered items in the category of endophoproic markers. None of which had appeared on the search lists provided in previous studies such as Hyland (2005b) or Dhal (2004).

Third, this study has shown that possible disciplinary differences existed among different social science disciplines. This adds to previous findings on cross-disciplinary variation in metadiscourse between the broad division of hard and soft disciplines (e.g. Hyland, 2000, 2005c). This study has not only corroborated some previous findings about some nuanced differences in textual conventions within soft disciplines (e.g., literary studies versus linguistics in Afros & Schryer, 2009; applied linguistics versus economics in Khedri et al., 2013; literary studies versus history versus psychology in MacDonald, 1994) but also provided new evidence of such differences by focusing on a wide range of metadiscoursal resources and on different (sub)disciplines. In other words, variation in the use of metadiscourse among the applied linguistics, education, and psychology RAs further enriched possible discipline-specific rhetorical conventions of academic discourse.

Last but not least, methodologically, the present study has contributed to the corpus-based approach to academic writing by employing a specialized corpus. The majority of existing specialized corpora and research projects tend to investigate academic discourse from cross-cultural/linguistic and/or cross-disciplinary perspectives, such as the KIAP project (Cultural Identity in Academic Prose) (Fløttum, Dahl, & Kinn, 2006), the InterLAE project (Interpersonality in Written Academic Discourse) (Lafuente-Millán, et al., 2010), and the CADIS (Corpus of Academic Discourse) (Gotti, 2010), in addition to Hyland's corpora (2000, 2005b, 2005c).

Although those corpus-based projects have generated a myriad of research output in cross-linguistic and cross-disciplinary comparisons, none of them has given attention to cross-paradigmatic comparisons. The design of the subcorpora in this study allows me to doubly compare disciplines and research paradigms. Such a design opens up a new perspective for research on metadiscourse in particular, and discursive practices in general.

7.4 Implications

The findings from this study have pedagogical implications for the practices of writing for publication, writing instruction in EAP courses, and materials design and development.

This study suggests that specific disciplines and research paradigms have discipline- and paradigm-specific discourse conventions, for example, different ways of organizing information, structuring arguments, and interacting with readers. For instance, we have seen that the quantitative and qualitative research paradigms used different types of visual displays and differed in the frequencies of such displays. As another example, both the education and the applied linguistics RAs in the corpus were more likely to boost propositions about their results and knowledge claims than the psychology RAs. These patterns of rhetorical features, as Hyland (2012) points out, are "closely related to the social and epistemological practices of the disciplines and as a result represent important ways of signaling a competent disciplinary identity" (p.205). In short, this study has identified some rhetorical conventions and expectations prevailing in particular contexts and could provide academic writers with successful examples of using metadiscoursal resources in academic communication.

These findings may be useful to some novice and non-native English-speaking scholarly writers who are under great pressure to write and publish RAs in international refereed, English-medium journals. These writers may benefit from knowledge about some discourse conventions specific to certain disciplines and paradigms in the social sciences. For example, some novice writers who work within the qualitative paradigm in applied linguistics may find it difficult to master its "self-reflexive, rhetorically complex, and generically unstable research report mode" (Belcher & Hirvela, 2005, p.187). This study has provided some useful information about some rhetorical strategies used in published qualitative research, such as how qualitative writers express their epistemic and attitudinal stances differently from those of quantitative researchers. Thus the findings of this study may inform those scholarly writers about available metadiscoursal resources to be exploited in reporting research derived from different paradigms.

In terms of writing instruction, research has shown that explicit instruction on metadiscourse in EAP writing classrooms can help raise students' consciousness about the contextual factors of academic writing and can improve their written texts (e.g., Cheng & Steffensen, 1996). While general training in metadiscourse use may be beneficial for undergraduate student writers, the findings of this study and those from previous research (e.g., Afros & Schryer, 2009; Hood, 2011; Hyland, 2000, 2005b, 2005c; Khedri et al., 2013; Koutsantoni, 2006; North, 2005) suggest that a discipline- and paradigm-specific approach may be more useful for advanced learners such as graduate students who are learning to write in different disciplines and paradigms. Some discipline- or paradigm-specific rhetorical conventions may be occluded to

these inexperienced academic writers or newcomers in a particular discipline. Therefore, the findings from the present study and previous research may be used to raise novice academic writers' awareness of these specific conventions and could be used to help advanced learners to exploit metadiscoursal resources for their own purposes. As one possible application, the findings from this study could be incorporated into genre-based approaches to writing instruction in EAP/ESP classroom. For example, Swales and Feak (2010) have proposed a textual-based approach to turning discourse-analytic research findings on abstract writing into classroom materials and activities. In a similar way, empirical findings from this study can inform materials and activities developed in EAP/ESP courses, in combination with findings from genre-based research on RAs (e.g., Lewin et al., 2001; Lim, 2010; Yang & Allison, 2003). As suggested by Swales and Feak (2010), such materials and activities could begin with raising novice writers' rhetorical consciousness about the role and function of a particular RA section or part-genre. Next, attention may be directed to the macro structures of the relevant parts and then move to more micro elements, such as the use of metatextual expressions as orientations for readers, the expression of epistemic certainty and uncertainty in presenting and discussing results. Such a two-pronged approach can help learners to "move from analysis to awareness to acquisition" (Swales & Feak, 2010, p.170). Previous research in genre-based writing instruction suggests that advanced learners can be taught to analyze genre exemplars and identify conventionalized generic features (e.g., Cheng, 2006, 2007, 2008). It has been found that the engagement with academic texts through genre-analysis tasks can raise learners' rhetorical awareness and foster them as

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"writerly reader[s]" who can critically read RAs from writers' perspectives (Cheng, 2008, p.67). Thus, the findings from this study may be utilized in designing genre-analysis activities to support their critical engagement with discipline- and paradigm-specific genre conventions.

One way to enact this combined writing pedagogy is to design what is called "data-driven learning" (DDL) (e.g., Cheng, 2012; Gavioli, 2005) or "do it yourself" (Charles, 2012) activities for learners on the basis of specialized corpora. In this type of learning activity, learners will, under the guidance of teachers, take the initiative to compile a corpus, explore corpus tools, investigate linguistic features and interpret data. Previous literature has found this approach suited particularly well to EAP/ESP teaching and learning (e.g., Charles, 2012; Gavioli, 2005). To design such pedagogical activities, for example, the findings from the present study and the freely available corpus software, such as UAM Corpus Tool (O' Donnell, 2012), could be introduced to EAP/ESP learners. First, a demonstration could be provided to learners to familiarize them with basic corpus techniques, which is important especially for those learners who are from non-linguistic disciplines (Charles, 2012). Then learners can be taught how to construct their own small-scale corpora within their specialized fields. With guidance from the instructor, learners can start to conduct their own search of salient metadiscoursal features characteristic to their own disciplines and research paradigms. For example, different rhetorical functions of metadiscourse can become the focus of corpus-based investigation, such as mitigating or boosting knowledge claims, making connections between different parts of the text, or showing comparison and contrast (cf. Charles, 2012). Corpus findings such as concordance

lines and collocations may be compared and discussed in class. Further, a discourse-analytic approach can be used to complement this corpus approach. For example, learners can be taught to analyze the generic moves and steps of a particular academic genre and see what linguistic features are used to realize the rhetorical functions of those moves and steps. The combination of corpus and genre-based approaches can provide learners with rich opportunities to discover how linguistic resources such as metadiscourse are used in their discipline and/or paradigms. Of course, the success of direct data-driven learning or do-it-yourself corpus pedagogy may depend to a great extent on available resources and teachers' support. While the literature thus far shows that it has received positive evaluation from EAP/ESP learners (e.g., Charles, 2012; Gavioli, 2005), more research may be necessary to investigate its long-term effect on teaching and learning.

Another pedagogical implication from this study concerns curriculum design and materials development in the teaching of academic writing. Harwood (2005c) pointed out that many EAP textbook writers failed to consult research findings from corpus studies when designing pedagogical materials and thus had an unsatisfactory treatment of some key academic language conventions such as hedging and modality. Although Harwood (2005c) cautioned that it might be over-simplistic to base textbook advice entirely on expert corpora such as the journal articles for learners, I would argue expert corpora may still be useful for more advanced learners, such as students at graduate level who need to learn and produce similar genres in their own disciplines. As one example, the cross-disciplinary/cross-paradigmatic differences in metadiscourse use can be incorporated into learning materials on research report

writing. Although many introductory textbooks on research methodologies contain chapters about how to report research (e.g., Cohen, et al., 2011; Creswell, 2009) and there are also book-length guides on writing empirical research reports or theses (e.g., Bitchener, 2010; Paltridge & Starfield, 2007; Wolcott, 2009), most of these texts tend to focus on macro-level issues such as structure and organization in academic discourse with less attention paid to micro-level issues such as language choices (but see Swales & Feak, 2004 for an exception). Thus the results of this study can inform the development of learning for scholarly writing programs intended for students from the relevant social sciences and research paradigms.

7.5 Limitations of the Study and Recommendations for Further Research

This study has revealed that the use of metadiscourse in the post-method sections of RAs was shaped by both disciplinary and paradigmatic influences. However, the results must be considered in light of the limitations of this study.

First, although the results of this study were based on a carefully stratified random sample, the data in the corpus were gathered from only a limited number of journals in a few subfields of the three disciplines represented in the corpus. Therefore, the findings may not be generalizable to subfields or research paradigms not represented in the corpus. Given the diverse landscape of the social sciences, it would be necessary for further research to include more disciplines and sub-disciplines to replicate the results and extend the conclusions from this study.

As a second limitation, this study has focused on the use of metadiscourse in the post-method sections of RAs. Consequently, it is not clear whether and to what extent metadiscourse is deployed similarly in the other sections of RAs. Although

Mur-Dueñas (2012) found more similarities than differences in the types of metadiscoursal resources between two different rhetorical steps in Introduction and Discussion sections of business management RAs, there is no further evidence for cross-sectional differences in metadiscourse use in RAs. In further research, it would be useful to investigate metadiscourse in the pre-method sections of RAs to (a) get a comprehensive understanding of metadiscourse across disciplines and paradigms; and (b) examine how the pre- and the post-method sections of RAs may possibly vary in their deployment of metadiscoursal resources.

Third, although this study has drawn both corpus-based and interview data, given the constraints of resources, the interview data were limited in quantity and have been used to mainly supplement the corpus findings. Since metadiscourse use in RAs may be subject to complex influences from socio-cultural contexts, a primarily corpus-based study may not be able to reveal how more specific contextual factors might have interacted and shaped the use of metadiscourse in RAs, such as individual differences of RA writers, the role of academic gatekeepers (e.g., journal editors, reviewers), and reporting style manuals (e.g., *Publication manual of the American Psychological Association*). More ethnographic data collected with methods of qualitative inquiry, such as those from in-depth interviews with specialist informants (e.g., Harwood, 2006) or the ethnography as a methodology (Lillis, 2008), should be gathered in further research to investigate how insiders from specific communities of discourse practices perceive and respond to the use of metadiscoursal resources (Hyland, 2000).

While this study has provide some initial evidence of cross-disciplinary and

cross-paradigmatic differences in the use of metadiscourse in academic writing in three social science disciplines, several other important directions for further research may be suggested. One possible direction for further research is to map the analysis of metadiscourse features onto the analysis of rhetorical moves (see Del Saz-Rubio, 2011, for an example). A combination of an analysis of lexical and grammatical features with a genre-based analysis may help us achieve a better understanding of how academic writers deploy various metadiscoursal resources in different parts of RAs to achieve their rhetorical purposes step by step.

Another direction for further research is to carry out more nuanced comparisons within each of the major research paradigms. While this study has made a tripartite distinction among quantitative, qualitative, and mixed methods research, each of these major paradigms subsumes a variety of specific methodologies (Creswell, 2009; Johnson & Christensen, 2012; see also Section 4.2.2.1for different methodological designs). It would be useful to investigate whether intra-group homogeneity and heterogeneity in the use of metadiscourse exist within the quantitative, qualitative, or mixed methods paradigms. Such information can provide more fine-tuned information to RA writers and readers.

Finally, further research can also examine the use of metadiscoursal features in RAs from a diachronic perspective. While rhetorical practices in academic writing, such as reference patterns (Salager-Meyer,1999) and certain types of interactional metadiscourse such as hedges and boosters (Gillaerts & Van de Velde, 2010) have been found to evolve with the progression of time, it would be interesting to study whether the use of other types of metadiscourse would also display any tendency for

diachronic evolution. Such diachronic research has great potential to contribute to our understanding of how research and discourse practices have developed over time.

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APPENDICES

Appendix I: A List of Research Articles in the Corpus

Applied Linguistics

(Quantitative)

1   Bardovi-Harlig, K. (2009). Conventional Expressions as a Pragmalinguistic Resource: Recognition and Production of Conventional Expressions in L2 Pragmatics. *Language Learning, 59*, 755-795.

2   Bitchener, J., & Knoch, U. (2010). The Contribution of Written Corrective Feedback to Language Development: A Ten Month Investigation. *Applied Linguistics, 31*, 193-214.

3   Chavez, M. (2007). Students' and Teachers' Assessments of the Need for Accuracy in the Oral Production of German as a Foreign Language. *The Modern Language Journal, 91*, 537-563.

4   Cheung, H., Chan, M., & Chong, K. (2007). Use of Orthographic Knowledge in Reading by Chinese-English Bi-scriptal Children. *Language Learning, 57*, 469-505.

5   Dimroth, C. (2008). Age Effects on the Process of L2 Acquisition? Evidence From the Acquisition of Negation and Finiteness in L2 German. *Language Learning, 58*, 117-150.

6   Jiang, N., Novokshanova, E., Masuda, K., & Wang, X. (2011). Morphological Congruency and the Acquisition of L2 Morphemes. *Language Learning, 61*, 940-967.

7   Jiang, N. A. N., & Nekrasova, T. M. (2007). The Processing of Formulaic Sequences by Second Language Speakers. *The Modern Language Journal, 91*, 433-445.

8   Kang, O., Rubin, D. O. N., & Pickering, L. (2010). Suprasegmental Measures of Accentedness and Judgments of Language Learner Proficiency in Oral English. *The Modern Language Journal, 94*, 554-566.

9   Kato, S. (2009). Suppressing Inner Speech in ESL Reading: Implications for Developmental Changes in Second Language Word Recognition Processes. *The Modern Language Journal, 93*, 471-488.

10   Laufer, B., & Girsai, N. (2008). Form-focused Instruction in Second Language Vocabulary Learning: A Case for Contrastive Analysis and Translation. *Applied Linguistics, 29*, 694-716.

11   Lazarte, A. A., & Barry, S. (2008). Syntactic Complexity and L2 Academic Immersion Effects on Readers' Recall and Pausing Strategies for English and Spanish Texts. *Language Learning, 58*, 785-834.

12   Martinez, R. O. N., & Murphy, V. A. (2011). Effect of Frequency and Idiomaticity on Second Language Reading Comprehension. *TESOL Quarterly, 45*, 267-290.

13   Montrul, S., Foote, R., & Perpiñán, S. (2008). Gender Agreement in Adult Second Language Learners and Spanish Heritage Speakers: The Effects of Age and Context of Acquisition. *Language Learning, 58*, 503-553.

14   Moussu, L. (2010). Influence of Teacher-Contact Time and Other Variables on ESL Students' Attitudes Towards Native- and Nonnative-English-Speaking Teachers. *TESOL Quarterly, 44*, 746-768.

15   Munro, M. J., & Derwing, T. M. (2008). Segmental Acquisition in Adult ESL Learners: A Longitudinal Study of Vowel Production. *Language Learning, 58*, 479-502.

16   Roehr, K. (2008). Metalinguistic Knowledge and Language Ability in University-Level L2 Learners. *Applied Linguistics, 29*, 173-199.

17 Schmitt, N., Jiang, X., & Grabe, W. (2011). The Percentage of Words Known in a Text and Reading Comprehension. *The Modern Language Journal, 95*, 26-43.

18 Schwieter, J., & Sunderman, G. (2009). Concept Selection and Developmental Effects in Bilingual Speech Production. *Language Learning, 59*, 897-927.

19 Taguchi, N. (2007). Task Difficulty in Oral Speech Act Production. *Applied Linguistics, 28*, 113-135.

20 Taguchi, N. (2011). The Effect of L2 Proficiency and Study-Abroad Experience on Pragmatic Comprehension. *Language Learning, 61*, 904-939.

(Qualitative)

1 Barkhuizen, G. (2010). An Extended Positioning Analysis of a Pre-Service Teacher's Better Life Small Story. *Applied Linguistics, 31*, 282-300.

2 Blackledge, A., Creese, A., Baraç, T., Bhatt, A., Hamid, S., Wei, L., . . . Yağcioğlu, D. (2008). Contesting 'Language' as 'Heritage': Negotiation of Identities in Late Modernity. *Applied Linguistics, 29*, 533-554.

3 Bown, J. (2009). Self-Regulatory Strategies and Agency in Self-Instructed Language Learning: A Situated View. *The Modern Language Journal, 93*, 570-583.

4 Brooks-Lewis, K. A. (2009). Adult Learners' Perceptions of the Incorporation of their L1 in Foreign Language Teaching and Learning. *Applied Linguistics, 30*, 216-235.

5 Coryell, J. E., Clark, M. C., & Pomerantz, A. (2010). Cultural Fantasy Narratives and Heritage Language Learning: A Case Study of Adult Heritage Learners of Spanish. *The Modern Language Journal, 94*, 453-469.

6 Cross, J. (2011). Social-Cultural-Historical Contradictions in an L2 Listening Lesson: A Joint Activity System Analysis. *Language Learning, 61*, 820-867.

7   Frazier, S. (2007). Tellings of Remembrances 'Touched off' by Student Reports in Group Work in Undergraduate Writing Classes. *Applied Linguistics, 28*, 189-210.

8   Friedman, D. A. (2010). Speaking Correctly: Error Correction as a Language Socialization Practice in a Ukrainian Classroom. *Applied Linguistics, 31*, 346-367.

9   Gan, Z., Davison, C., & Hamp-Lyons, L. (2009). Topic Negotiation in Peer Group Oral Assessment Situations: A Conversation Analytic Approach. *Applied Linguistics, 30*, 315-334.

10 Gánem Gutiérrez, A. (2008). Microgenesis, Method and Object: A Study of Collaborative Activity in a Spanish as a Foreign Language Classroom. *Applied Linguistics, 29*, 120-148.

11 Holmes, J., & Marra, M. (2011). Harnessing Storytelling as a Sociopragmatic Skill: Applying Narrative Research to Workplace English Courses. *TESOL Quarterly, 45*, 510-534.

12 Kanno, Y., & Stuart, C. (2011). Learning to Become a Second Language Teacher: Identities-in-Practice. *The Modern Language Journal, 95*, 236-252.

13 Marsh, A. P., & Tainio, L. (2009). Other-Repetition as a Resource for Participation in the Activity of Playing a Video Game. *The Modern Language Journal, 93*, 153-169.

14 McDonough, K. I. M., & Chaikitmongkol, W. (2007). Teachers' and Learners' Reactions to a Task-Based EFL Course in Thailand. *TESOL Quarterly, 41*, 107-132.

15 Menard-Warwick, J. (2008). The Cultural and Intercultural Identities of Transnational English Teachers: Two Case Studies from the Americas. *TESOL Quarterly, 42*, 617-640.

16 Mills, N. (2011). Teaching Assistants' Self-Efficacy in Teaching Literature: Sources, Personal Assessments, and Consequences. *The Modern Language Journal, 95*, 61-80.

17 Nakane, I. (2007). Problems in Communicating the Suspect's Rights in Interpreted Police Interviews. *Applied Linguistics, 28*, 87-112.

18 Polio, C., & Zyzik, E. V. E. (2009). Don Quixote Meets Ser and Estar: Multiple Perspectives on Language Learning in Spanish Literature Classes. *The Modern Language Journal, 93*, 550-569.

19 Rizza, C. (2009). Semantically Redundant Language—A Case Study. *Applied Linguistics, 30*, 276-294.

20 Yan, J. X., & Horwitz, E. K. (2008). Learners' Perceptions of How Anxiety Interacts With Personal and Instructional Factors to Influence Their Achievement in English: A Qualitative Analysis of EFL Learners in China. *Language Learning, 58*, 151-183.

(Mixed methods)

1 Borg, S. (2009). English Language Teachers' Conceptions of Research. *Applied Linguistics, 30*, 358-388.

2 Caldas, S. J. (2008). Changing Bilingual Self-Perceptions from Early Adolescence to Early Adulthood: Empirical Evidence from a Mixed-Methods Case Study. *Applied Linguistics, 29*, 290-311.

3 Chang, L. Y.-H. (2010). Group Processes and EFL Learners' Motivation: A Study of Group Dynamics in EFL Classrooms. *TESOL Quarterly, 44*, 129-154.

4 Charkova, K. D. (2007). A Language without Borders: English Slang and Bulgarian Learners of English. *Language Learning, 57*, 369-416.

5 Derwing, T. M., Munro, M. J., & Thomson, R. I. (2008). A Longitudinal Study of ESL Learners' Fluency and Comprehensibility Development. *Applied*

Linguistics, 29, 359-380.

6   Etienne, C., & Sax, K. (2009). Stylistic Variation in French: Bridging the Gap Between Research and Textbooks. *The Modern Language Journal, 93*, 584-606.

7   Garrett, P., & Young, R. F. (2009). Theorizing Affect in Foreign Language Learning: An Analysis of One Learner's Responses to a Communicative Portuguese Course. *The Modern Language Journal, 93*, 209-226.

8   GutiÉRrez, X. (2008). What Does Metalinguistic Activity in Learners' Interaction During a Collaborative L2 Writing Task Look Like? *The Modern Language Journal, 92*, 519-537.

9   Hamid, M. O., Sussex, R., & Khan, A. (2009). Private Tutoring in English for Secondary School Students in Bangladesh. *TESOL Quarterly, 43*, 281-308.

10 He, D., & Zhang, Q. (2010). Native Speaker Norms and China English: From the Perspective of Learners and Teachers in China. *TESOL Quarterly, 44*, 769-789.

11 Isurin, L. (2007). Teachers' Language: L1 Attrition in Russian–English Bilinguals. *The Modern Language Journal, 91*, 357-371.

12 Kim, Y. (2008). The Effects of Integrated Language-Based Instruction in Elementary ESL Learning. *The Modern Language Journal, 92*, 431-451.

13 Lamb, M. (2007). The Impact of School on EFL Learning Motivation: An Indonesian Case Study. *TESOL Quarterly, 41*, 757-780.

14 Liu, D., & Jiang, P. (2009). Using a Corpus-Based Lexicogrammatical Approach to Grammar Instruction in EFL and ESL Contexts. *The Modern Language Journal, 93*, 61-78.

15 Macintyre, P. D., & Legatto, J. J. (2011). A Dynamic System Approach to Willingness to Communicate: Developing an Idiodynamic Method to Capture

Rapidly Changing Affect. *Applied Linguistics, 32*, 149-171.

16 O'Halloran, K. (2011). Investigating Argumentation in Reading Groups: Combining Manual Qualitative Coding and Automated Corpus Analysis Tools. *Applied Linguistics, 32*, 172-196.

17 Razfar, A., & Simon, J. (2011). Course-Taking Patterns of Latino ESL Students: Mobility and Mainstreaming in Urban Community Colleges in the United States. *TESOL Quarterly, 45*, 595-627.

18 Suzuki, M. (2008). Japanese Learners' Self Revisions and Peer Revisions of Their Written Compositions in English. *TESOL Quarterly, 42*, 209-233.

19 Toth, P. D. (2008). Teacher- and Learner-Led Discourse in Task-Based Grammar Instruction: Providing Procedural Assistance for L2 Morphosyntactic Development. *Language Learning, 58*, 237-283.

20 Vandergrift, L., & Tafaghodtari, M. H. (2010). Teaching L2 Learners How to Listen Does Make a Difference: An Empirical Study. *Language Learning, 60*, 470-497.

Education (Quantitative)

1 Ainsworth, S., & Burcham, S. (2007). The impact of text coherence on learning by self-explanation. *Learning and Instruction, 17*, 286-303.

2 Bowman, N. A. (2010). Can 1st-Year College Students Accurately Report Their Learning and Development? *American Educational Research Journal, 47*, 466-496.

3 Brown, G. T. L., Irving, S. E., Peterson, E. R., & Hirschfeld, G. H. F. (2009). Use of interactive–informal assessment practices: New Zealand secondary students' conceptions of assessment. *Learning and Instruction, 19*, 97-111.

4 Fang-Ying, Y., & Chin-Chung, T. (2010). Reasoning about science-related uncertain issues and epistemological perspectives among children.

Instructional Science, 38, 325-354.

5   Glenberg, A. M., Goldberg, A. B., & Zhu, X. (2011). Improving early reading comprehension using embodied CAI. *Instructional Science, 39*, 27-39.

6   Hofer, M., Fries, S., Helmke, A., Kilian, B., Kuhnle, C., Živković, I., . . . Helmke, T. (2010). Value orientations and motivational interference in school-leisure conflict: The case of Vietnam. *Learning and Instruction, 20*, 239-249.

7   Janssen, J., Erkens, G., Kirschner, P. A., & Kanselaar, G. (2010). Effects of representational guidance during computer-supported collaborative learning. *Instructional Science, 38*, 59-88.

8   Mainhard, M. T., Brekelmans, M., & Wubbels, T. (2011). Coercive and supportive teacher behaviour: Within- and across-lesson associations with the classroom social climate. *Learning and Instruction, 21*, 345-354.

9   Malmberg, L.-E. (2008). Student teachers' achievement goal orientations during teacher studies: Antecedents, correlates and outcomes. *Learning and Instruction, 18*, 438-452.

10   McElvany, N., & Artelt, C. (2009). Systematic reading training in the family: Development, implementation, and initial evaluation of the Berlin Parent–Child Reading Program. *Learning and Instruction, 19*, 79-95.

11   Nie, Y., & Lau, S. (2010). Differential relations of constructivist and didactic instruction to students' cognition, motivation, and achievement. *Learning and Instruction, 20*, 411-423.

12   Nokes, T., Hausmann, R., VanLehn, K., & Gershman, S. (2011). Testing the instructional fit hypothesis: the case of self-explanation prompts. *Instructional Science, 39*, 645-666.

13   Polikoff, M. S., Porter, A. C., & Smithson, J. (2011). How Well Aligned Are State Assessments of Student Achievement With State Content Standards?

American Educational Research Journal, 48, 965-995.

14 Rohrer, D., & Taylor, K. (2007). The shuffling of mathematics problems improves learning. *Instructional Science, 35*, 481-498.

15 Saunders, W. M., Goldenberg, C. N., & Gallimore, R. (2009). Increasing Achievement by Focusing Grade-Level Teams on Improving Classroom Learning: A Prospective, Quasi-Experimental Study of Title I Schools. *American Educational Research Journal, 46*, 1006-1033.

16 Sonnenschein, S., Stapleton, L. M., & Benson, A. (2010). The Relation Between the Type and Amount of Instruction and Growth in Children's Reading Competencies. *American Educational Research Journal, 47*, 358-389.

17 Tse, S. K., Marton, F., Ki, W. W., & Loh, E. K. Y. (2007). An integrative perceptual approach for teaching Chinese characters. *Instructional Science, 35*, 375-406.

18 Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2008). Achievement goal orientations and subjective well-being: A person-centred analysis. *Learning and Instruction, 18*, 251-266.

19 Wagner, P., Schober, B., & Spiel, C. (2008). Time students spend working at home for school. *Learning and Instruction, 18*, 309-320.

20 Weinstock, M., & Zviling-Beiser, H. (2009). Separating academic and social experience as potential factors in epistemological development. *Learning and Instruction, 19*, 287-298.

(Qualitative)

1 Ashcraft, C. (2008). So Much More Than"Sex Ed": Teen Sexuality as Vehicle for Improving Academic Success and Democratic Education for Diverse Youth. *American Educational Research Journal, 45*, 631-667.

2   Barton, A. C., & Tan, E. (2010). We Be Burnin! Agency, Identity, and Science Learning. *Journal of the Learning Sciences, 19*, 187-229.

3   Bastedo, M. N. (2009). Conflicts, Commitments, and Cliques in the University: Moral Seduction as a Threat to Trustee Independence. *American Educational Research Journal, 46*, 354-386.

4   Berland, L. K. (2011). Explaining Variation in How Classroom Communities Adapt the Practice of Scientific Argumentation. *Journal of the Learning Sciences, 20*, 625-664.

5   Cucchiara, M. B., & Horvat, E. M. (2009). Perils and Promises: Middle-Class Parental Involvement in Urban Schools. *American Educational Research Journal, 46*, 974-1004.

6   Gallucci, C., Van Lare, M. D., Yoon, I. H., & Boatright, B. (2010). Instructional Coaching: Building Theory About the Role and Organizational Support for Professional Learning *American Educational Research Journal, 47*, 919-963.

7   Haas, E., & Fischman, G. (2010). Nostalgia, Entrepreneurship, and Redemption: Understanding prototypes in higher education. *American Educational Research Journal, 47*, 532-562.

8   Kim, H., & Hannafin, M. (2009). Web-enhanced case-based activity in teacher education: a case study. *Instructional Science, 37*, 151-170.

9   Laat, M., Lally, V., Lipponen, L., & Simons, R.-J. (2007). Online teaching in networked learning communities: A multi-method approach to studying the role of the teacher. *Instructional Science, 35*, 257-286.

10   Lefstein, A. (2008). Changing Classroom Practice Through the English National Literacy Strategy: A Micro-Interactional Perspective. *American Educational Research Journal, 45*, 701-737.

11   Nasir, N. i. S., & Hand, V. (2008). From the Court to the Classroom:

Opportunities for Engagement, Learning, and Identity in Basketball and Classroom Mathematics. *Journal of the Learning Sciences, 17*, 143-179.

12 Nemirovsky, R. (2011). Episodic Feelings and Transfer of Learning. *Journal of the Learning Sciences, 20*, 308-337.

13 O'Connor, C., Mueller, J., Lewis, R. L. H., Rivas-Drake, D., & Rosenberg, S. (2011). "Being" Black and Strategizing for Excellence in a Racially Stratified Academic Hierarchy. *American Educational Research Journal, 48*, 1232-1257.

14 Peterson, E. R., & Irving, S. E. (2008). Secondary school students' conceptions of assessment and feedback. *Learning and Instruction, 18*, 238-250.

15 Rezai-Rashti, G. M., & Martino, W. J. (2010). Black Male Teachers as Role Models: Resisting the Homogenizing Impulse of Gender and Racial Affiliation. *American Educational Research Journal, 47*, 37-64.

16 Stevenson, H. (2007). Restructuring Teachers' Work and Trade Union Responses in England: Bargaining for Change? *American Educational Research Journal, 44*, 224-251.

17 Stritikus, T., & Nguyen, D. (2007). Strategic Transformation: Cultural and Gender Identity Negotiation in First-Generation Vietnamese Youth. *American Educational Research Journal, 44*, 853-895.

18 Turner, J. C., Warzon, K. B., & Christensen, A. (2011). Motivating Mathematics Learning: Changes in Teachers' Practices and Beliefs During a Nine-Month Collaboration *American Educational Research Journal, 48*, 718-762.

19 Ylimaki, R. M., & Brunner, C. C. (2011). Power and Collaboration-Consensus/Conflict in Curriculum Leadership. *American Educational Research Journal, 48*, 1258-1285.

20 Zhang, M., Lundeberg, M., & Eberhardt, J. (2011). Strategic Facilitation of

Problem-Based Discussion for Teacher Professional Development. *Journal of the Learning Sciences, 20*, 342-394.

(Mixed methods)

1 Berti, A. E., Toneatti, L., & Rosati, V. (2010). Children's Conceptions About the Origin of Species: A Study of Italian Children's Conceptions With and Without Instruction. *Journal of the Learning Sciences, 19*, 506-538.

2 Boldrin, A., & Mason, L. (2009). Distinguishing between knowledge and beliefs: students' epistemic criteria for differentiating. *Instructional Science, 37*, 107-127.

3 Ellis, R. A., Goodyear, P., Calvo, R. A., & Prosser, M. (2008). Engineering students' conceptions of and approaches to learning through discussions in face-to-face and online contexts. *Learning and Instruction, 18*, 267-282.

4 Enyedy, N., & Mukhopadhyay, S. (2007). They Don't Show Nothing I Didn't Know: Emergent Tensions Between Culturally Relevant Pedagogy and Mathematics Pedagogy. *Journal of the Learning Sciences, 16*, 139-174.

5 Hill, H. C., Kapitula, L., & Umland, K. (2011). A Validity Argument Approach to Evaluating Teacher Value-Added Scores. *American Educational Research Journal, 48*, 794-831.

6 Huang-Yao, H., Fei-Ching, C., Ching, C., & Wen-Ching, C. (2011). Teacher-education students' views about knowledge building theory and practice. *Instructional Science, 39*, 467-482.

7 Iding, M., Crosby, M., Auernheimer, B., & Barbara Klemm, E. (2009). Web site credibility: Why do people believe what they believe? *Instructional Science, 37*, 43-63.

8 Jacobson, M., Kapur, M., Hyo-Jeong, S., & June, L. (2011). The ontologies of complexity and learning about complex systems. *Instructional Science, 39*, 763-783.

9   Kapur, M. (2010). Productive failure in mathematical problem solving. *Instructional Science, 38*, 523-550.

10   Lindblom-Ylänne, S., Nevgi, A., & Trigwell, K. (2011). Regulation of university teaching. *Instructional Science, 39*, 483-495.

11   Nathan, M. J., Eilam, B., & Kim, S. (2007). To Disagree, We Must Also Agree: How Intersubjectivity Structures and Perpetuates Discourse in a Mathematics Classroom. *Journal of the Learning Sciences, 16*, 523-563.

12   Nievelstein, F., van Gog, T., Boshuizen, H. P. A., & Prins, F. J. (2010). Effects of conceptual knowledge and availability of information sources on law students' legal reasoning. *Instructional Science, 38*, 23-35.

13   Oksa, A., Kalyuga, S., & Chandler, P. (2010). Expertise reversal effect in using explanatory notes for readers of Shakespearean text. *Instructional Science, 38*, 217-236.

14   Onwuegbuzie, A. J., Witcher, A. E., Collins, K. M. T., Filer, J. D., Wiedmaier, C. D., & Moore, C. W. (2007). Students' Perceptions of Characteristics of Effective College Teachers: A Validity Study of a Teaching Evaluation Form Using a Mixed-Methods Analysis. *American Educational Research Journal, 44*, 113-160.

15   Oortwijn, M., Boekaerts, M., & Vedder, P. (2008). The impact of the teacher's role and pupils' ethnicity and prior knowledge on pupils' performance and motivation to cooperate. *Instructional Science, 36*, 251-268.

16   Roscoe, R., & Chi, M. (2008). Tutor learning: the role of explaining and responding to questions. *Instructional Science, 36*, 321-350.

17   Schwarz, B. B., & Linchevski, L. (2007). The role of task design and argumentation in cognitive development during peer interaction: The case of proportional reasoning. *Learning and Instruction, 17*, 510-531.

18   van Aalst, J., & Chan, C. K. K. (2007). Student-Directed Assessment of

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Appendix II: A List of Metadiscourse in the Corpus

Interactive Metadiscourse

Code glosses

Exemplification

as an example	like
e.g.	more specifically
for example	say
for instance	specifically
here is an example	such as
in another example	to exemplify
in particular	

Reformulation

alternatively	stated differently
be defined as	that is
be interpreted to mean that	that is to say
become known as	that means that
i.e.	that would mean
in other words	this does not mean
in short	this is sometimes called
it also means	this means
known as	this might be called
mean	to be more accurate
meaning that	to be more exact
means that	to state this another way
meant that	(be) called
namely	we called
or what I prefer to call	which is to say that
put differently	which means that
put plainly	which refers to
referred to as	which would mean that
simply put	will be called
specifically	dash

Transitions

Addition

additionally	further
also (sentence conjuncts)	furthermore

and (sentence conjuncts)

and moreover

as well(sentence conjuncts)

at the same time

besides

further to this

in addition

moreover

plus

too(sentence conjuncts)

Comparison

again	nevertheless
and similarly	nonetheless
but	notwithstanding
but rather	on one hand
by comparison	on the contrary
by contrast	on the flip side
by the same token	on the one hand
contrarily	on the other
conversely	on the other hand
however	once again
in comparison	otherwise
in contrast	rather
in the same vein	regardless
instead	similarly
likewise	still
meanwhile	yet

Consequence

accordingly	for this reason
after all	hence
and hence	it follows that
and so	logically
and therefore	so
as a consequence	then
consequently	therefore
for such reasons	thus

Frame Markers

Sequencers

a second factor	lastly
a second limitation	last but not least,
a third element	meanwhile,
a third possible reason	next,
at the same time	on one hand,
as a point of departure	on the one hand,

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begin	on the other
begin by	on the other hand
begin with	second
finally	secondly
first	then
firstly	the first
first and foremost	thereafter
first of all	third
for another	thirdly
for one thing	to begin,
in first place	to start with
in the end	ultimately
in the former aspect	what follows then
last	I (II, III);1（2,3...); a (b, c…)

Topicalisers

as for	regarding
as regards	returning to
as to	to return
concerning	turn now to
in regards to	turn our attention to
in terms of	turn to
in that regard	turning to
in this regard	with regard to
in this respect	with regards to
now	with respect to

Stage labels

above all	on the whole
all in all	overall
at this point	so far
in brief	taken together
in closing	taking the results together
in conclusion	thus far
in drawing conclusions	together
in general	to conclude
in short	to review
in sum	to sum up
in summary	to summarize
in summary of above findings	

Announcers

an aim of this paper	the focus of this article
are now discussed	the presentation is focused on
are presented	the purpose of
in this section	the results are divided into three
as will be seen	sections
discussions of each topic are organized	the results section chronicles
I begin by describing	the study will consider
I describe	this discussion will be organized
I discuss	this section
I elaborate on	this section addresses
I examine	this section aims to
I explore	this section is structured
I focus on	chronologically
I have organized my discussion	this section outlines
I illustrate	this section presents
I introduce	we analyze
I look across	we will address
I look more closely at	we will analyze
I present	we will arrange
I provide	we will compare
I return to	we will deal with
I seek to	we will first address
I then characterize	we will illustrate
I then revisit	we will interpret
I will approach	we will now analyze
I will discuss	we will now compare
I will explore	we will now examine
I will first consider	we will now illustrate
I will illustrate	we will now turn to
I will limit my focus	we will provide examples
I will not discuss	we will see
I will now refer to	we will show
I will organize	we would like to
I will present	what we are to see next
I will revisit later	will
in the current section	will be analyzed
in the remainder of this section	will be discussed
in this section	will begin by discussing
in this section of the article	will focus only on
in this subsection	will further explore
my focus	will illuminate
my goal in this paper	will present
one purpose of these descriptions	would like to
our intent here	

the aim of the present study
the findings section includes two main
    subsections

Endophoric markers

Text references

I. Previews

as discussed below
as discussed in greater detail in the
following paragraphs
as discussed in the next section
as discussed later in this paper
as follows
as seen below
as seen in the following
as suggested below
as will be seen below
as will be seen later
below
can be summarized as follows
described below
discussed in more detail below
described in the following
discussed later
following
following examples
I mention below
in our concluding sections
in subsequent sections
in the analyses that follow
in the case study which follows
in the conclusion of the paper
in the Discussion
in the discussion section
in the final section of the article
in the final section of this essay
in the following
in the following discussion
in the following paragraphs
in the following section

in the following sections of analysis
in the following subsection
in the 'How are Claims made' section
in the last section of this article
in the learning curves analysis
in the next section
in the next sections
in the paragraphs that follow.
in the problem-solving section
in the remainder of this section
in the section following (Quadrant IV
in the segment below
in the subsection thereafter
in the worked examples section
in what follows
later
later in a section
outlined below
reported below
the first part of the Results section
the following
the following discussion
the following paragraphs
the following sections
the following short narrative
the following two subsections
the next section
the remainder of this discussion
the results are presented as follows
the second part
these results are reported next
this section focuses
will be referred to below

II. Reviews

above
above findings
above relations
above rendition
aforementioned
already indicated
argued earlier
as alluded to earlier
as already mentioned in the beginning
of this article
as argued above
as defined earlier
as described above
as described earlier
as described in the literature review
as discussed
as discussed above
as discussed earlier
as discussed in prior sections
as discussed in the Introduction
as discussed in the section on
    methodology
as discussed previously
as elaborated in the introduction
as explained above
as explained earlier
as fully detailed in the Introduction
as has been illustrated
as I noted earlier
as identified earlier in the article
as implied earlier
(as in the above extract)
as in the discussion of
as indicated above
as indicated earlier
as indicated previously
as mentioned
as mentioned above
as mentioned before
as mentioned earlier
as mentioned earlier in this article
as mentioned in 'Introduction' section
via Atlas-ti' section
as mentioned in the introduction

as we suggested earlier
at the beginning of this article
at the end of the introductory section
cited above
described above
described earlier
described in the analysis above
discussed above
discussed earlier
discussed earlier in the level 1 analysis
discussed previously
earlier
earlier in our discussion
in the introductory part of the paper
highlighted earlier
in a later section
in a previous section
in my discussion of Extract 2
in our introduction
in Results under Interview
in the above sections
in the above segment
in 'The Discussion Coding Process'
    section
in the early sections of this article
in the first set of analyses given earlier
in the introduction to this article
in the literature review
in the paragraph immediately above
in the preceding discussion
in the previous section
in the section on the challenges of using
    corpora
in the sections above
in this article
in this section
mentioned above
mentioned earlier
noted earlier
outlined at the beginning of the article
outlined in the Introduction
outlined in the previous section
previously
put forward above

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as mentioned in the Methodology section
as mentioned previously
as noted
as noted above
as noted before
as noted earlier
as noted in the Introduction
as noted previously
as observed earlier
as outlined above
as outlined in the Analysis section
as pointed out at the beginning of this
    article
as pointed out earlier
as presented above
as presented in previous sections
as previously argued
as previously mentioned
as previously noted
as previously stated
as quoted above
as reported above
as reported earlier
(as reported in Section 3.2.2)
as reported in the study
(as reported previously)
as seen earlier
as shown above
as stated above
as stated earlier
as suggested in the quantitative results
    section
as suggested previously

quoted above
referred to above
reported above
reported earlier
reported previously
reviewed earlier
stated above
stated earlier
stressed above
the above
the above analysis
the above conclusions
the above discussion
the above finding
the above findings
the above research findings
the above results
the above speculation
the current paper
the discussion above
the following
the preceding
the preceding discussion
the preceding section
the results described above
the results presented in the previous
    section
under the 'Methods sections'

III. Overviews

described in this article
here (refers to the article)
here and elsewhere
in the body of the article
in the study reported here
in this article
in this paper

the broad aim of this paper
the current paper
the present paper
this article
this article's purpose
this paper
throughout the paper

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Visual references

according to Table 1	Episode 1
as displayed in Table 4	Example 1
appendix 1	Excerpt 1
as Excerpt33 illustrates	Extract 1
as Fig. 2 indicated	Fig. 1
as seen from Table 7	the following excerpts
as shown in Episode 1	the following instances
as the next excerpt reveals	the following quote
at the end of Example 4	the following segment
Chart 1 and 2	the following vignette

Evidential markers

Non-integral

(author + date) e,g., (Onwuegbuzie, 2003b); (Anderson 1993); (Anderson and Lebiere1998)

Integral

according to author (date)	as suggested by Gardner et al. (1997)
as Bakhtin (1990) pointed out	in Biber et al.'s (1999) study
as noted by Morrison and Connor (2002)	

Interactional Metadiscourse

Hedges

a possible explanation	it seems that
aims to	it was anticipated that
another possibility	it was assumed that
appear	it was deducted that
appear to	it was expected that
are also likely to	it was hypothesized that
are highly likely	it was not clear
are most likely to	it was possible that
arguable	it was proposed that
argue that	it was suggested that
as far as we know	it would seem that
as I hope	largely
assume that	lead us to

assuming that

at least to my knowledge

at least to some degree

attempt to

attempted

basically

be argued that

be expected that

be inclined to

be less likely that

be more likely to

be speculated that

broadly speaking

by and large

claim

commonly

conjecture that

could

do not lead to

does not confirm that

does not necessarily

does not provide definitive answers

essentially

expect that

indicate that

indicating that

is indicative of

it also appears that

it appears that

it appears then that

it can be argued that

it can be speculated that

it can be suggested that

it can still be presumed

it cannot be determined

it cannot be excluded that

it could be that

it has been argued that

it is also possible that

it is also very possible that

it is apparent that

it is assumed that

it is by no means certain that

it is conceivable that

it is doubtful that

it is equally possible that

less inclined to

less likely

mainly

makes it more likely

may

might

mostly

normally

not always

not necessarily

occasionally

often

overall

partially

partly

perhaps

plausible

points to

possibility that

possibly

postulates that

potentially

predicted that

prediction

presumably

primarily

principally

probably

propose that

quite possibly

relatively

roughly

slightly

sometimes

suggest that

suggesting that

suggestion that

surmise that

suspect that

tend to

the argument that

the assumption being that

the contention that

the hope

the hypothesis that

the least likely to

it is far from clear

it is further conjectured that

it is likely that

it is not clear

it is not known

it is not quite clear

it is plausible that

it is posited that

it is possible that

it is possible to argue that

it is possible to speculate that

it is probable that

it is quite probable that

it is still likely that

it is suggested that

it is tempting to

it is therefore unclear

it is uncertain

it is unclear

it is very possible that

it may also be the case that

it may be that

it may even be that

it may simply be that

it might also be the case that

it might be that

it remains to be seen

it seemed that

the likelihood that

the possibility that

the potential to

the prediction that

the proposal that

the speculation that

the suggestion that

the view that

there is no assurance that

there is reason to believe that

there is reason to think that

this leads us to

to a certain extent

to my knowledge

to our knowledge

to some extent

unnecessarily

usually

venture to suggest that

virtually

we hope

we hypothesize that

we propose that

we suggest that

we suspect that

we think that

what I perceive to be

what is not clear

would

Booster

actually

always

apparently

are unlikely to

as a matter of fact

as the results confirm

as this study has demonstrated

as this study has shown

be concluded that

be emphasized that

believe that

by no means

cannot

it was natural that

it was obvious that

it was therefore evident that

it was unlikely that

know

leaves little doubt that

literally

most obviously

must

naturally

necessarily

needless to say

never

368

categorically

certainly

clear that

clearly

completely

conclude that

concludes that

confirm that

decidedly

definitely

demonstrate that

demonstrating that

did

discovered that

discovery that

do

does

emphasize that

ensure that

entirely

evidently

exactly

exclusively

find that

finding that

firmly

found that

fully

genuinely

highly

I believe

illustrating that

impossible

in effect

in essence

in fact

indeed

inevitably

invariably

is unlikely to

it became clear that

it can be concluded that

it has been demonstrated that

it has been shown previously that

it is apparent that

it is certain that

no doubt

not likely

noticeably

obvious

obviously

of course

pointed out

precisely

prove to

provide evidence that

really

remarkably

revealed

revealing that

reveals

show

showing that

shown that

shows

simply

stress that

strongly

surely

the conclusion that

the fact that

the finding that

the reality that

the well-established finding that

there is every reason to believe

there is no denying that

this fact

this project has shown

this study's finding that

this was obvious that

to be sure

truly

unambiguously

underline that

underscore

undoubtedly

uniformly

uniquely

unlikelihood that

unlikely that

unlikely to

we also found that

it is clear that

it is evident that

it is highly unlikely that

it is immediately apparent that

it is improbable that

it is natural that

it is obvious that

it is quite clear that

it is true that

it is undeniable that

it is unlikely

it should be clear

it showed that

it shows that

it was also found that

it was apparent that

it was becoming clear that

it was clear that

it was concluded that

it was evident

it was found that

we believe that

we can conclude that

we can say with confidence that

we concluded that

we do not believe

we found that

what is also clear

what is becoming increasingly clear is

what is clear

what is evident

what the data show is that

will

will not

without a doubt

Attitude markers

accept that

acknowledge

admittedly

after all

agree with

arguable

as anticipated

as predicted

as we hypothesized

best

caution against

contrary to

counterintuitive

critical

crucially

desirable

encouraging

essential

expect (ed)

happily

it is hoped

it is widely agreed that

it was acknowledged

it was necessary to

key limitation

must

necessary

need (to)

nicely

not unreasonably

paradoxically

premature

problematic

should

spurious

spurious finding

strategically speaking

surprise

surprising (ly)

understandably

have to	unexpectedly
I hope that	unfortunately
ideally	useful
importance	valuable
important (ly)	want to
interest	wish to
interesting (ly)	wonder
ironically	wonderful
it is conceded that	worth
it is debatable	worthwhile

Self-mentions

I	this author
me	us
our	we (exclusive)
researchers	

Engagement markers

Reader pronouns

as we can see	some might argue that
in our efforts	the interested reader
one	the reader
one assumes that	we
one can argue	we also saw that
one may argue that	when one considers
one would say	when we take a closer look at
others might suggest that	you
our discussion	yourself
skeptics	

Directives

as can be seen	it is not difficult to notice that
assume that	it is of interest to note
assuming that	it is sufficient to note that
bear in mind that	it is time to reconsider
cf.	it is worth bearing in mind that
consider	it should also be noted
if we assume that	it should be noted that

it also interesting to note

it can be noted that

it can be seen

it is also important to consider

it is also important to note

it is also interesting to note

it is also noticeable that

it is equally important to note

it is important to first recall that

it is important to remember

it is indeed noteworthy that

it is interesting to note

it is interesting to see

it is necessary to note that

it should not be ignored that

keeping in mind

let us

must

needs to bear in mind that

note

noteworthy

notice

please note that

recall

remembering that

see

should

what is particularly important to note

Shared knowledge

of course

it is true that

it is well-known that

Questions

Real and rhetorical questions

Asides

Comments addressed towards readers(in
Parentheses and between dashes)

Appendix III: Letter of Invitation to Interview

Dear Professor XX,

My name is Cao Feng. I'm a full-time PhD student from the English Language and literature Academic Group, National Institute of Education (NIE), Nanyang Technological University (NTU), Singapore.

I'm conducting a research study as part of the requirements of my PhD degree in Applied Linguistics, and I would like to invite you to participate in my research.

My research project focuses on language use in research articles. You have been invited because you are an expert in your field of study and I'm very interested in hearing about your experience and views on conducting research and writing research papers. If you decide to participate, you will have a face to face interview with me based on an excerpt from one of your own published papers.

Attached to this invitation is a Participant Information Sheet. This will provide you with further information about the interview and who to contact if you have any questions. If you are willing to participate after reading this information, the interview shall be arranged at a time and location most convenient to you.

I very much value your feedback and I hope that you will consider sharing your knowledge and expertise so that we can improve our knowledge of research writing and help novice researchers in your field. Thank you very much for your consideration!

With best regards,

Cao Feng (Daniel)
National Institute of Education,
Nanyang Technological University, Singapore 37616.
Mobile: (65) 91675018
Email: cao.feng@outlook.com

Appendix IV: Participant Information Sheet and Consent Form

Information about me as a researcher

My Name is Cao Feng. I'm a PhD student of Applied Linguistics from the National Institute of Education (NIE), Nanyang Technological University (NTU), Singapore. I am now working on my doctoral dissertation under the supervision of Dr. Hu Guangwei, an associate professor from NIE/NTU.

What is the purpose of my research?

I aim to investigate the use of some academic writing conventions in published research articles in different disciplines and research paradigms. Part of my research plan is to conduct interviews with experts from each discipline and learn about perceptions and attitudes towards research and writing practice. You are invited to participate in this interview study because you are an expert in your field and I believe your experience as a senior researcher and expert writer will be very valuable to our knowledge about the academic practices of your field of study.

What will you do?

If you agree to participate, I will conduct an interview at a time and location most convenient to you. The interview will be approximately one hour. In the interview, you will first be asked a few open-ended questions relevant to your research practice. Then you will be asked a few open-ended questions based on some excerpts from one of your own published papers. I may audio-record the interview during the interview if you do not object. If necessary and only with your agreement, we can schedule for additional follow-up interviews.

How will your confidentiality be protected?

I will use your interview data in my thesis to be submitted to NIE/NTU for

examination and for research purposes such as conference presentations and written publications. Nevertheless, I will be very careful and protect you from being identified in the reporting of the research data or in any future publication based on my PhD project. As far as I know, there is no potential risk of embarrassment or invasion of privacy in taking part in my research project. I will store your interview data in a safe place and will take security measures against loss and unauthorized access. I will permanently destroy the data 3 years after my project is completed.

Is participation voluntary?

You are invited to take part in my research, but your participation is completely voluntary. You do not have to take part in this research if you do not wish to. In addition, you have the right to withdraw from the interview at any time without any negative consequences. You also have the right to modify or withdraw your own data at the end of the interview.

Having said that, I very much hope you will take part in my interview study because your contribution will help me find out more about how research is done and written up in your field. I hope my research will also be useful to you, and I'd like to share my findings with you if you are interested.

I will be very grateful to your participation. To express my gratitude, at the end of the interview I wish to thank you by offering you 20$ as a token of my appreciation.

How about ethical considerations?

My research study has been reviewed by the Social, Behavioural, Educational Sciences Institutional Review Board, Nanyang Technological University, Singapore. If you have any questions about your rights as a participant in this research, you can contact NTU Institutional Review Board, Research Support Office, Nanyang Technological University, 50 Nanyang Avenue, 639798, Singapore.

Email: d-rso@ntu.edu.sg

Tel: (65) 65921816

Fax: (65) 67912397

How to contact me (the researcher)?

For information about this study, please contact me, Cao Feng, at the National Institute of Education (NIE), Nanyang Technological University (NTU) , 1 Nanyang Walk, Singapore 637616.

Email: cao.feng@outlook.com

Tel: (+65) 67903578

Mobile: (+65) 91675018

Part II. Informed Consent Form

Participant's confirmation statement

I have been given and read the Participant Information Sheet describing the nature of the above study. I understand the purpose and process of the above research project and my involvement in it. I also understand that Cao Feng will render my personal data/information anonymous and protect the privacy and confidentiality of my personal data/information.

I voluntarily accept the invitation to participate in the above study, and I give my permission that what my interview data will be audio-recorded/saved as documents by Cao Feng. I certify that I have been given a copy of this consent form.

Name of Participant:

Signature of Participant & Date

Researcher's confirmation statement

I have provided information about my study to the participant and believe that he/she understands the nature of my study, the expectations of the procedures, and the rights of a research participant. I certify that I obtained the informed consent of the participant whose signature is above.

Name of Researcher:
Signature of Researcher & Date:

Appendix V: Interview Guide

Purpose: To investigate experienced scholarly writers' research and writing practice

Introduction

The main focus of our interview today is to understand more about how you conduct research in your field of study and write up your research reports. You are an expert in your field so there are no wrong answers to any of my questions.

Part I Questions concerning research and writing

1. What type of research do you do? Is this a typical example of the kind of paper you write and kind of research you do?

2. Did the reviewers or editors make any comments about your language use?

3. Did the journal you submitted the manuscript to have any influence on your writing, including the diction or other stylistic features?

4. Is there anything else which you think may have influenced the way this article was written?

5. In your research, which approach to research do you usually take, quantitative, qualitative, mixed-methods, or others? How do you decide on your research approach?

6. How do you view the quantitative-qualitative divide concerning research methodology? Do you believe that there are fundamental differences between these methodologies? Why or why not?

7. In your opinion, are there any differences in writing up different types of research, for example, quantitative and qualitative? Why or why not?

8. Which type of research report is more challenging to write? Why?

Part II Sample questions based on the participant's own text

Present an excerpt from the post-method RA sections:

Main Questions about interactive metadiscourse

1. On page xxx, when presenting your results, you used a repetitive pattern: *Therefore, there was no reason to believe that…*When reporting your research results, do you often use expressions such as *therefore*, *as a result*, *consequently* to represent a cause-effect relationship?

2. In presenting the findings and analysis, I noted you sometimes announced what was to be discussed in the next section or paragraphs. Why was it necessary to refer forwards or backwards? Is this a common practice of writing in your discipline?

3. When disusing the limitations of the study, you listed three limitations by saying *one of the limitations was that*, *another limitation was that*, *a third limitation was that*; Is this a common way to organize the discussion in writing research reports?

4. You have cited from a wide range of literature in your article. May I ask how do you decide which references should appear in the parentheses (e.g. p. xxx) and which should be incorporated into the text flow? Again, is this a common practice in your discipline? Why?

Main Questions about interactional metadiscourse

1. In your Summary and Discussion sections (p. xxx), you used many modal verbs such as *may*, *could*, and adjectives such as *possible explanation*, *probably*, *due to*, that has *probably* caused; Why the tone here sounded a bit speculative and uncertain? But on page xxx, there is: *it is clear that …*The tone here was relatively certain. On what basis did you adjust the degree of certainty or uncertainty of your knowledge claims? Do you think these expressions are typical in writing research report? Why?

2. At the bottom of page xxx, you used *unfortunately*, *we…* Do you think it is typical to express writers' attitudes or emotions in reporting research results?

3. I noted that in this article, you referred yourself and your coauthor as *we* and this reference have frequently occurred in Results and Discussion sections. While many people claim that academic writing should be impersonal and objective, do you think this kind of self-reference is a common practice in reporting research in your discipline? Or is it simply an individual preference? Why?

Closing the interview

Is there anything else you'd like to add to what we have discussed so far?

Would you like me to send you copy of my notes/ transcripts so you can see if I got it straight or if there is anything you would like to add or correct?