Title	Interactive metadiscourse in research articles: A comparative study of paradigmatic and disciplinary influences
Author(s)	Feng Cao and Guangwei Hu
Source	*Journal of Pragmatics, 66*, 15-31. http://dx.doi.org/10.1016/j.pragma.2014.02.007
Published by	Elsevier

Interactive metadiscourse in research articles: A comparative study of paradigmatic and disciplinary influences

Feng Cao & Guangwei Hu

Abstract

This article reports a comparative study of interactive metadiscourse in quantitative and qualitative research articles across the disciplines of applied linguistics, education, and psychology. Drawing on Hyland's metadiscourse framework, the study examined the use of five types of interactive metadiscourse, together with their subtypes, in a corpus of 120 research articles. Quantitative and qualitative analyses revealed clear cross-paradigmatic differences in the incidence of reformulators, comparative and inferential transitions, sequencers, and non-linear references. The analyses also identified marked cross-disciplinary differences in the use of exemplifiers, comparative transitions, linear references, and integral citations. These observed differences are interpretable in terms of the contrasting epistemologies underlying the qualitative and quantitative research paradigms and the different knowledge-knower structures prevailing in the disciplines under investigation.

Keywords: disciplinary discourse; epistemology; interactive metadiscourse; knowledge-knower structure; qualitative research; quantitative research

Citation:

Cao, F., & Hu, G. (2014). Interactive metadiscourse in research articles: A comparative study of paradigmatic and disciplinary influences. Journal of Pragmatics, *66*, 15-31.

1. Introduction

This article reports a corpus-based study of how academic writers from three social science disciplines use interactive metadiscourse in quantitative and qualitative research articles (RAs). The importance of metadiscourse to academic communication has received growing scholarly attention over the past few decades (Hyland, 1998b, 2005a; Mauranen, 1993; Vande Kopple, 1985), and a plethora of studies have examined its use in various types of academic writing, particularly in the prestigious academic genre of RAs (e.g., Abdi, 2002; Abdi et al., 2010; Dahl, 2004; Del Saz Rubio, 2011; Hyland, 1998b, 2005b; McGrath and Kuteeva, 2012; Mur Dueñas, 2011; Peterlin, 2005). There are diverse conceptualizations and classifications of metadiscourse (Ädel and Mauranen, 2010). In her review of previous research, Ädel (2006) distinguishes a broad and a narrow approach to conceptualizing metadiscourse. The broad approach defines metadiscourse as covering both linguistic resources drawn on for textual organization (i.e., textual functions) and those deployed to communicate authorial attitudes (i.e., interpersonal functions). The narrow approach, by contrast, delimits metadiscourse as comprising only linguistic elements that are used to achieve textual functions. In this study, we have adopted the broad approach, as instantiated by Hyland's (2005a) interpersonal model of metadiscourse, for several reasons. First, as Ädel (2006:180) points out, the narrow approach "restricts the concept of metadiscourse too severely" by leaving out writer-reader interaction. Second, the separation of textual from interpersonal functions by the narrow approach fails to recognize that "all metadiscourse is interpersonal in that it takes account of the reader's knowledge, textual experiences, and processing needs" (Hyland and Tse, 2004:161). Finally, Hyland's metadiscourse model has been widely applied in previous studies of metadiscourse; thus, its adoption in this study would allow our findings to be compared with those from the extant body of research.

Hyland's framework defines metadiscourse as reflective language used by the writer/speaker to interact with the reader/hearer in a specific context of communication and draws a distinction between interactive and interactional metadiscourse. In written discourse, interactive metadiscourse is used to organize a text in anticipation of readers' needs and to facilitate their comprehension by guiding them through the text, whereas interactional metadiscourse is deployed to signal the writer's epistemic stance on propositional information and his/her attitude toward readers so as to involve them in the joint construction of the text (Hyland, 2005a). Although both types of metadiscourse are essential to successful academic communication, most previous studies focused on interactional metadiscourse in RAs (e.g., Abdi, 2002; Abdollahzadeh, 2011; Hyland, 1998a, 2005b; McGrath and Kuteeva, 2012). Furthermore, with notable exceptions (e.g., Khedri et al., 2013), the small number of existing inquiries into interactive metadiscourse (e.g., Bunton, 1999; Dahl, 2004; Hyland, 1999, 2007; Peterlin, 2005) typically examined only a subset of interactive resources each time, which made it difficult to identify common mechanisms shaping the use of interactive metadiscourse as a whole. This study set out to bridge these gaps by investigating all types of interactive resources in Hyland's metadiscourse framework in a cross-paradigmatic and cross-disciplinary comparative research design.

2. Background of the study

2.1 Disciplinary variations in the use of interactive metadiscourse

Research on metadiscourse has often centered on cross-disciplinary comparisons since academic writers from different disciplinary communities are expected to follow different conventions in knowledge production and communication (Becher and Trowler, 2001; Hyland, 2000). Academic disciplines are traditionally classified into "hard" and "soft" ones according to the nature of knowledge produced (Becher and Trowler, 2001). This division parallels Bernstein's (1999:162) distinction between "hierarchical knowledge structures" and "horizontal knowledge structures" in intellectual fields. Simply put, the hard disciplines or hierarchical knowledge structures view scientific knowledge as cumulative, empirically grounded, value-free, and constitutive of general theories which can be verified through invariant procedures and consensual criteria. The soft disciplines or horizontal knowledge structures, on the other hand, see knowledge as reiterative, contextual, value-laden, and relying on argumentation rather than clear-cut, universally shared criteria for verification. These perceived differences between intellectual fields motivated previous studies of cross-disciplinary variations in metadiscourse, which found systematic differences between hard and soft disciplines in the use of both interactional metadiscourse (e.g., Hyland, 1998a, 1998b, 2005b; Hyland and Tse, 2004) and interactive metadiscourse (e.g., Dahl, 2004; Hyland, 1999, 2007; Peacock, 2010).

With regard to interactive metadiscourse, which is the focus of the present study, Hyland (2007) reported that the hard and soft disciplines included in his corpus of 240 RAs differed markedly in the use of code glosses, a type of interactive metadiscourse for reformulating or exemplifying propositional meaning (e.g., *in other words, for instance*). Specifically, while the hard disciplines made more frequent use of code glosses for reformulation, the soft disciplines employed them for exemplification more often. Cross-disciplinary differences along the hard-soft line were also found in an earlier study (Hyland, 1999) of another type of interactive metadiscourse, evidential markers (i.e., references to information from other texts). RAs in the soft disciplines were found to use notably more evidential markers than those in the hard disciplines. Furthermore, non-integral evidential markers (where the cited source is not syntactically part of the citing sentence) dominated disciplines like physics or engineering, whereas integral evidential markers (where the cited source is a syntactic constituent of the citing sentence) were more frequently found in disciplines such as applied linguistics and philosophy. Finally, although all disciplines preferred a summary or paraphrase of referenced information, only the soft disciplines used direct quotations from cited sources.

Research on other types of interactive metadiscourse showed a similar contrast between hard and soft disciplines. Peacock (2010) compared the use of linking adverbials (which overlap to a great extent with Hyland's transitional markers) in 320 RAs across eight disciplines divided into sciences and non-sciences. The results showed a clear tendency for the science disciplines to use fewer linking adverbials than the non-science disciplines. Parallel hard-soft discrepancies were also observed in the

use of endophoric markers (e.g., *as noted above*) and frame markers (e.g., *to sum up*) or the so-called locational and rhetorical metatext (Dahl, 2004). Based on a corpus of 180 RAs sampled from three disciplines, Dahl (2004) found that the discipline of medicine used far less locational and rhetorical metatext than economics and linguistics. These cross-disciplinary differences were attributed to different ways of arguing and reporting between medicine on the one hand and economics and linguistics on the other. In a small-scale study drawing on Hyland's work on interactive metadiscourse, Khedri et al. (2013) compared 60 RA abstracts from economics and applied linguistics and discovered both similarities and differences in their use of interactive metadiscourse. While the relative frequencies for the different types of interactive metadiscourse followed a similar distributional pattern in both disciplines, the applied linguistics abstracts used markedly more interactive metadiscourse than the economics abstracts for all types except transitional markers.

As can be noted above, previous research on cross-disciplinary variations in interactive metadiscourse centered predominantly on comparing soft and hard disciplines. Little comparative research, however, exists within hard or soft disciplines. As a response, we have chosen to focus on applied linguistics, education, and psychology in the present study not only to enrich our understanding of metadiscourse use in these under-researched disciplines (especially the latter two) but also to determine if there are discipline-specific patterns of interactive metadiscourse across the three soft disciplines and between different research paradigms within each discipline.

2.2 Research paradigms and metadiscourse

The word *paradigm* was first used by Thomas Kuhn (1970:175) to refer to "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given [scientific] community." Although this term was originally coined for the natural sciences, it has been borrowed subsequently by research methodologists (e.g., Guba, 1990; Guba and Lincoln, 2005) to refer to a basic set of ontological and epistemological beliefs underlying approaches of inquiry that guide different research traditions in the social sciences. While diverse paradigms have been contending for dominance, quantitative and qualitative research constitute two major paradigms in the social sciences (Creswell, 2009; Johnson and Christensen, 2012). The epistemological assumptions associated with quantitative and qualitative paradigms are believed to not only govern the conduct of empirical research in each tradition (Carter and Little, 2007) but also shape the discourse and rhetorical conventions in which empirical research is presented (Holliday, 2007; Madigan et al., 1995).

Despite such perceptions of the relationship between research paradigms and academic discourse, there has been little empirical research on the rhetorical conventions of quantitative and qualitative research reporting. The few extant studies (e.g., Firestone, 1987; Hansen, 1988; Sallinen and Braidwood, 2009) were largely exploratory and offered only impressionistic generalizations about paradigm-based rhetorical preferences. For example, Firestone (1987) compared the rhetorical styles of a quantitative study and a qualitative study in education and found that they used different persuasive strategies. Specifically, the quantitative study reported detailed research procedures,

whereas the qualitative study offered a rich description of the results by including quotations and excerpts from the data. Firestone suggested that the different persuasive strategies were due to the different methodological assumptions underlying the quantitative and the qualitative paradigm. In a similar comparison between the reports of a qualitative study in anthropology and a quantitative study in sociology, Hansen (1988) found that whereas the quantitative report frequently hedged its knowledge claims in discussion and offered a tentative conclusion, the qualitative report was less tentative in its discussion of findings and more assertive and authoritative in its conclusions. Furthermore, the quantitative study assumed an impersonal style by suppressing authorial presence in text and frequently using passive-voice structures and impersonal sentence subjects such as *research*, *this paper*, and *findings*. In contrast, the qualitative report shifted skillfully between the style of an omniscient researcher/author and that of a self-revealing storyteller. Connections between research paradigm and rhetoric were also explored by Sallinen and Braidwood (2009), who compared the discursive features of two quantitative and two qualitative RAs in nursing science. 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, made frequent self-references, and had fewer impersonal subjects. These rhetorical differences, according to Sallinen and Braidwood, were due to the argumentative and non-argumentative nature of the quantitative and qualitative RAs, which seemed to reflect specific epistemologies of the two research paradigms.

The richly suggestive findings of the few exploratory studies notwithstanding, to our knowledge, no empirical research has been conducted to compare the use of metadiscourse, let alone interactive metadiscourse, between qualitative and quantitative RAs in different disciplines. Given that knowledge construction and representation constitute socio-rhetorical activities (Latour and Woolgar, 1986) and because metadiscourse is integral to academic discourse, there is a need to examine how paradigmatic beliefs, epistemologies, and methods of inquiry may shape the use of metadiscourse in general and interactive metadiscourse in particular. To address this lacuna in cross-paradigmatic research on academic discourse as well as those gaps identified earlier in cross-disciplinary research, the present study was designed to map possible cross-disciplinary and cross-paradigmatic differences in the use of all the interactive resources identified in Hyland's metadiscourse framework. While previous studies on metadiscourse examined entire RAs (e.g., Dahl, 2004; Hyland, 1999, 2007) or such individual sections as Abstract (e.g., Khedri et al., 2013), Introduction (e.g., Del Saz Rubio, 2011), Discussion (e.g., Abdi, 2002), and Conclusion (e.g., Abdollahzadeh, 2011), this study focused on the "post-method" sections of RAs by merging individual parts labeled as Results/Findings, Discussion, and Conclusion. The merging was motivated by the fact that RAs, especially qualitative research reports, may not always follow a standard introduction-method-results-discussion format (Swales, 1990) but display considerable structural variations in the post-method sections (Lin and Evans, 2012). Consequently, the merged post-method sections would allow us to compare

functionally equivalent parts of RAs across different disciplines and paradigms. Given the complexities of presenting intricate findings, explicating the reasoning behind knowledge claims, and making compelling connections between findings and conclusions, there is good reason to expect the post-method section to be an ideal site for exploring discipline- and paradigm-specific patterns of interactive metadiscourse. Specifically, our study was guided by the following two questions:

1. Do the post-method sections of RAs in applied linguistics, education, and psychology differ in their use of interactive metadiscourse?
2. Do the post-method sections of qualitative and quantitative RAs in the aforementioned disciplines differ in their use of interactive metadiscourse?

3. Analytical framework

To address the research questions, we adopted Hyland's (2005a) taxonomy of interactive metadiscourse as our analytic framework, though we also drew on previous research to make some finer distinctions within the taxonomy. This framework distinguishes five main types and thirteen subtypes of interactive metadiscourse (see Table 1). These types and subtypes of interactive metadiscourse, albeit not exhaustive, cover a comprehensive range of metadiscoursal resources in various linguistic forms. Metadiscourse, including interactive metadiscourse, is inherently pragmatic and integral to the pragmatic study of (academic) discourse (Ädel, 2006; Hyland, 1998b). For example, it has been examined within speech act theory (Beauvais, 1989), from the perspective of the cooperative principle (Abdi et al., 2010), and in terms of relevance theory (Aguilar, 2008; Ifantidou, 2005). As Fuertes-Olivera et al. (2001:1292) point out, metadiscourse enables users to "achieve their specific purposes in accordance with two basic [pragmatic] principles: cooperation and least effort." In a similar vein, Hyland (1998b:437) argues that metadiscourse is "a central pragmatic construct which allows us to see how writers seek to influence readers' understandings of both the text and their attitude towards its content and the audience."

[Insert Table 1 about here]

The first main type of interactive metadiscourse in our analytic framework, code glosses, is used to explain, elaborate or rework propositional meanings. In terms of their pragmatic functions, code glosses contribute to the explicitness of communication by supplying explicatures or "by explicitating implicated premises and conclusions" (Murillo, 2004: 2066). Two subtypes of code glosses can be 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 and Bach, 2007; Hyland, 2007). The appropriate use of code glosses in RAs can elaborate on meaning and help readers grasp propositional information.

Transitional markers help create textual cohesion by signaling logical links between propositions. From a pragmatic perspective, they often explicitly encode information about inferential processes or procedures to lead readers to intended interpretations (Blakemore, 2002). This type of metadiscourse

comprises what is variously termed internal conjunctions (Halliday and Hasan, 1976; Martin and Rose, 2003), discourse connectives (Blakemore, 2002), linking adverbials (Biber et al., 1999), and logical markers (Mur Dueñas, 2009). In this study, transitional markers were restricted to inter-sentential devices. Following previous studies (e.g., Gardezi and Nesi, 2009; Mur Dueñas, 2009), intra-sentence connectors, such as *because*, *although*, and *since*, were excluded because were used primarily for syntactic purposes rather than as metadiscoursal logical markers. Based on their semantic functions, transitional markers can be further classified into three subtypes: addition (e.g., *moreover*, *in addition*), comparison (e.g., *similarly*, *in comparison*) or contrast (e.g., *however*, *by contrast*), and inference (e.g., *therefore*, *consequently*). A judicious use of transitions can ease the reader's burden of making connections between preceding and subsequent propositional information.

Another main type of interactive metadiscourse, frame markers, is used primarily to organize texts for readers. Frame markers are a cover term for a variety of linguistic devices and can be further classified 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 and Degand, 2008:681), 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 relations. Together, frame markers can be used to achieve the pragmatic functions of organizing a text locally/globally and reducing readers' processing effort by explicitly marking textual structures and boundaries (Aguilar, 2008).

Endophoric markers are reflexive language used to refer to other parts of a text. Also known as text references (Bunton, 1999) or locational metatext (Dahl, 2004), this type of metadiscourse is used as signposts that help the reader recover the writer's intended meanings. Informed by Mauranen's (1993) notion of text reflexivity and Bunton's (1999) work on linear and non-linear metatext, we make a functional extension of Hyland's (1998b, 2005a) category of endophoric markers by drawing a distinction between linear and non-linear references. Linear references (e.g., *in the following paragraphs*, *as presented in the previous section*) function as previews, reviews, or overviews in the unfolding text and encode "reflexivity of high explicitness" (Mauranen, 1993:180), whereas non-linear references (e.g., *as summarized in Table 1*, *see Excerpt 1 for an example*) refer to additional textual materials such as tables, figures, stand-alone examples or extracts. From a pragmatic perspective, endophoric markers can reduce unnecessary textual repetitions (Abdi et al., 2010) and guide readers toward an intended interpretation of the discourse by referring to the different parts of an unfolding text (Hyland, 2005a).

Finally, evidential markers present information from other texts (Hyland, 2005a). In academic discourse, evidential markers typically take the form of citations (Swales, 1990) or academic

attributions (Hyland, 1999). 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. Pragmatically, a judicious use of evidential markers in academic writing can open up or close down a dialogic space to alternative viewpoints (Hu and Wang, 2014), "strengthen readers' assumptions of adequate documentation" (White, 2011:3347), and indicate one's membership of a particular disciplinary community (Hyland, 1999).

4. Corpus materials and procedures

4.1 Corpus construction

The corpus constructed for this study consisted of 120 RAs from the subfields of language learning and teaching in applied linguistics, science learning and instruction in education, and clinical and counseling research in psychology. From each discipline, we selected four reputable peer-reviewed journals based on recommendations by disciplinary experts, previous studies of disciplinary variation in research paradigms and methods (e.g., Alise and Teddlie, 2010; Benson et al, 2009; Kidd, 2002), and journal rankings and five-year impact factors provided by ISI Web of Science (2011). The applied linguistics journals included *Applied Linguistics, Language Learning, TESOL Quarterly,* and *The Modern Language Journal.* The educational journals were *American Educational Research Journal, Instructional Science, Journal of the Learning Sciences,* and *Learning and Instruction.* The psychology journals consisted of *Journal of Abnormal Psychology, Journal of Consulting and Clinical Psychology, Journal of Counseling Psychology,* and *Professional Psychology: Research and Practice.* All selected journals were English-medium international journals of prestige in their respective fields.

To construct the corpus, we first extracted all full-length original RAs published between 2007 and 2011 from the selected journals, excluding research reviews, brief reports, and other non-empirical items. We then reviewed the Method section and other relevant parts of every RA for information on its global research design, data collection (e.g., sampling, methods of data collection, and types of data), and data analysis to identify its paradigmatic orientation. Based on this information, we classified each RA as qualitative, quantitative, or mixed-methods (Creswell, 2009). Finally, using a stratified random sampling strategy (Teddlie and Yu, 2007), we selected 20 quantitative and 20 qualitative RAs from each discipline to construct the corpus for this study. Although they represented an important research paradigm, the mixed-methods RAs were excluded from this study because our focus was on the epistemological contrast between quantitative and qualitative research rather than the hybrid nature of mixed-methods research. Table 2 presents the descriptive statistics for the corpus by discipline and paradigm. For each selected RA, we kept the main text only, removing its title, abstract, tables, figures, stand-alone quotations, excerpts of data, notes, and references.

[Insert Table 2 about here]

4.2 Data coding

All the corpus data were manually annotated, using the UAM CorpusTool (version 2.8; O'Donnell, 2012). To identify and code interactive metadiscourse, we started by examining the tokens of interactive metadiscourse in Hyland's (2005a) list. We removed some items (e.g., the intra-sentential connectors discussed earlier) from the list because in our opinion they were not interactive metadiscourse. Meanwhile, our preliminary examination of the corpus and thorough review of the relevant literature led us to add to our coding scheme items of interactive metadiscourse not found in Hyland's list. For instance, although such non-linear references as *excerpt*, *episode*, and *appendix* did not appear in Hyland's list and were excluded by Dahl (2004), they were found to be important metadiscoursal devices in our corpus. As metadiscourse expresses discourse-internal relations (Hyland, 2005a), we manually identified and coded each instance of interactive metadiscourse in context and excluded items that could be used as metadiscoursal devices elsewhere but signaled discourse-external relations in our 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 particular context.

To assess the reliability of the data coding, nine articles (7.5% of the corpus data) were independently coded by one of the authors and a second rater who was a doctoral student specializing in academic writing. The second rater received training in several sessions and was provided a coding scheme comprising definitions/explanations, examples, and detailed instructions. There was perfect agreement between the two coders in classifying the RAs as qualitative/quantitative. As regards the coding of interactive metadiscourse, 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 markers), with a mean of .90 for all five types combined. These kappa statistics indicated very good reliability.

4.3 Data analysis

We conducted both quantitative and qualitative analyses of the interactive metadiscourse identified in the corpus. For the quantitative analyses (using IBM-SPSS 21.0), we performed a series of 2 × 3 between-groups analysis of variance (ANOVA) to examine disciplinary (applied linguistics vs. education vs. psychology) and paradigmatic (quantitative vs. qualitative) effects on the frequency (per 1,000 words) of each main type and its subtypes of interactive metadiscourse. The alpha was set at .05 for all statistical tests. Where there was a significant main effect of discipline, following Field's (2009) recommendation, Tukey's HSD test was used to make post hoc pairwise comparisons between the disciplines. The qualitative analyses involved studying every instance of interactive metadiscourse in its context and examining how the various types and subtypes of interactive metadiscourse were

used qualitatively similarly or differently across the research paradigms and the disciplines.

5. Findings

In this section, the results of our quantitative and qualitative analyses are reported. The presentation of the results is organized according to the main types of interactive metadiscourse under investigation. Table 3 summarizes the descriptive statistics by discipline and paradigm for all five main types and thirteen subtypes of interactive metadiscourse found in the corpus. Overall, transitional markers and evidential markers occurred most frequently, followed by code glosses, endophoric markers, and frame markers.

[Insert Table 3 about here]

5.1 Code glosses

The ANOVA run on code glosses yielded neither a significant main effect of paradigm, $F(1, 114) = 2.497$, $p = .117$, $\eta_p^2 = .021$, nor a significant main effect of discipline, $F(2, 114) = 1.886$, $p = .156$, $\eta_p^2 = .032$, showing that there were no cross-disciplinary or cross-paradigmatic differences in the incidence of code glosses. There was no significant interaction between paradigm and discipline, $F(2, 114) = 0.006$, $p = .994$, $\eta_p^2 < .001$. Further analyses, however, revealed that although the effect of paradigm on the subtype of exemplifiers was non-significant, $F(1, 114) = 0.764$, $p = .384$, $\eta_p^2 = .007$, there was a significant main effect of discipline, $F(2, 114) = 3.416$, $p = .036$, $\eta_p^2 = .057$. The effect size indicated that discipline as an independent variable accounted for about 6% of the variance in the use of exemplifiers, reaching the criterial value suggested by Cohen (1988) for a medium effect (i.e., $\eta_p^2 = .058$). Tukey's HSD test revealed that whereas the psychology RAs ($M = 3.19$, $SD = 2.07$) used significantly more exemplifiers ($p = .041$) than the education RAs ($M = 2.24$, $SD = 1.20$), neither differed significantly from the applied linguistics RAs ($M = 2.42$, $SD = 1.76$; $p = .897$ and $p = .115$, respectively). As regards reformulators, the ANOVA yielded a significant main effect of paradigm, $F(1, 114) = 24.361$, $p < .001$, $\eta_p^2 = .176$, showing that the quantitative RAs ($M = 1.90$, $SD = 1.15$) used markedly more reformulators than the qualitative RAs ($M = 0.97$, $SD = 0.88$). The effect size showed that paradigm accounted for 17.6% of the variance in the use of reformulators, exceeding the criterion suggested by Cohen (1988) for a large effect (i.e., $\eta_p^2 = .138$). No significant effect of discipline was detected, $F(2, 114) = 0.098$, $p = .907$, $\eta_p^2 = .002$. Nor was there a significant discipline/paradigm interaction, $F(2, 114) = 0.824$, $p = .441$, $\eta_p^2 = .014$.

Despite the observed quantitative differences, the most prominent functions of code glosses in our corpus appeared to be similar between the paradigms and across the disciplines. The textual analysis indicated that exemplifiers were most typically used to present specific instances of general propositions (Examples 1 and 2) or to explain abstract and technical concepts via more accessible examples (Example 3):

(1) First, over half of the couples discussed discrimination by institutions, most commonly religious and legal institutions. **For example**, Brett's partner of 14 years, Jim, noted.… (PSY/QUAN15)

(2) Male students had various outbursts throughout the 2 weeks regarding the topic. Hieu, **for example**, could not believe that he had to learn these "embarrassing things". (EDU/QUAL17)

(3) 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)

The most common discourse functions of reformulators throughout the corpus were elaboration and delimitation. In elaboration, the second discourse units further elaborated or clarified the first discourse units (Examples 4 and 5). By contrast, in delimitation, the restatements in the second discourse units demarcated the scope of the propositions in the first discourse units (Examples 6 and 7).

(4) On the basis of the results of the univariate models, all bivariate LGMs consisted of an intercept and a nonlinear slope (**i.e.**, the slope loading for the last assessment was freely estimated) for each construct of interest. (PSY/QUAN10)

(5) 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…. (APL/QUAN17)

(6) In addition to problems with the metric, there are potential issues with self-report data. **That is**, teachers may overestimate or underestimate the amount of instructional activity. (EDU/QUAN16)

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

5.2 Transitional markers

The ANOVA run on transitional markers as a group revealed a significant effect of paradigm, $F(1,114) = 17.463$, $p < .001$, $\eta_p^2 = .133$. However, there was no significant main effect of discipline, $F(2,114) = 1.745$, $p = .179$, $\eta_p^2 = .030$. Neither was there a significant discipline/paradigm interaction, $F(2,114) = 0.212$, $p = .809$, $\eta_p^2 = .004$. As for the subtypes, the ANOVA on additive transitions found neither a significant effect of paradigm, $F(1,114) = 1.025$, $p = .313$, $\eta_p^2 = .009$, nor a significant effect of discipline, $F(2,114) = 0.588$, $p = .557$, $\eta_p^2 = .010$. Furthermore, there was no significant interaction between the two, $F(2,114) = 1.017$, $p = .365$, $\eta_p^2 = .018$. On the other hand, there was a significant effect of paradigm on comparative transitions, $F(1,114) = 10.820$, $p = .001$, $\eta_p^2 = .087$, indicating that the quantitative RAs ($M = 3.00$, $SD = 1.38$) used markedly more comparative transitions than the qualitative RAs ($M = 2.27$, $SD = 1.07$). A significant main effect of discipline was also found, $F(2,114) = 4.135$, $p = .018$, $\eta_p^2 = .068$. Post hoc Tukey's test showed that the applied linguistics RAs ($M = 2.95$, $SD = 1.46$) used comparative transitions markedly more frequently ($p = .018$) than the psychology RAs ($M = 2.20$, $SD = 0.92$), though neither differed from the education RAs ($M = 2.75$, $SD = 1.32$; $p = .760$ and $p = .103$, respectively). No significant discipline/paradigm interaction was detected, $F(2,114) = 0.491$, $p = .614$, $\eta_p^2 = .009$. The ANOVA on inferential transitions found a significant main

effect of paradigm, $F(1,114) = 19.548$, $p < .001$, $\eta_p^2 = .145$, revealing that inferential transitions occurred more frequently in the quantitative RAs ($M = 1.60$, $SD = 1.10$) than in the qualitative RAs ($M = 0.87$, $SD = 0.68$). However, the effect of discipline was non-significant, $F(2,114) = 1.936$, $p = .149$, $\eta_p^2 = .033$. Nor was a significant interaction found between paradigm and discipline, $F(2,114) = 0.708$, $p = .495$, $\eta_p^2 = .012$.

In our corpus, the discourse functions of additive transitions did not appear to differ qualitatively across the research paradigms and the disciplines. However, there were qualitative differences in the use of comparative transitions between the quantitative and qualitative RAs. Although they were frequently used in both subcorpora to signal relations of similarity and difference, comparative transitions were often employed uniquely in the quantitative RAs to contrast empirical results with initial expectations or alternative hypotheses, as illustrated by Examples 8 and 9:

(8) 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)

(9) Some of the remaining variance in the assessment of oral performance might indeed be explained by accented realization of phonemes. **However**, systematic individual differences among raters (rater bias) no doubt also contribute significant explanatory power. (APL/QUAN13)

Our textual analysis also revealed 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:

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

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

(12) **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 attributed to the effect of one or more of the feedback variables. (APL/QUAN15)

As shown in the above examples, inferential transitions were used jointly with causal language in the co-text (i.e., *driven by*, *associated with*, *attribute to*) to encode cause-effect relations in the knowledge claims or conclusions. In contrast, such co-occurrences of inferential transitions and causal language 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 (Example 13):

(13) These students debated one another's ideas until the teacher ended the discussion by asking whether students had questions for the other groups…. **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)

5.3 Frame markers

The ANOVA run on frame markers yielded a significant main effect of paradigm, $F(1, 114) = 12.369$, $p = .001$, $\eta_p^2 = .098$. In other words, the quantitative RAs ($M = 2.87$, $SD = 1.89$) used significantly more frame markers than the qualitative RAs ($M = 1.82$, $SD = 1.35$). However, no significant disciplinary effect was found, $F(2, 114) = 2.045$, $p = .134$, $\eta_p^2 = .035$. Nor was there a significant discipline/paradigm interaction, $F(2, 114) = 0.314$, $p = .731$, $\eta_p^2 = .005$. No further statistical tests were conducted on three subtypes of frame markers (i.e., topicalizers, stage-labels, and announcers) because there were insufficient instances for meaningful inferential analyses. However, we did run an ANOVA on sequencers, which yielded similar results to those obtained for frame markers as a group. Specifically, a significant effect of paradigm was detected, $F(1, 114) = 8.104$, $p = .005$, $\eta_p^2 = .066$, but no significant main effect of discipline was found, $F(2, 114) = 1.468$, $p = .235$, $\eta_p^2 = .025$. There was no significant discipline/paradigm interaction, $F(2, 114) = 0.738$, $p = .481$, $\eta_p^2 = .013$.

Our qualitative analyses suggested that frame markers served similar functions in the quantitative and qualitative RAs across the disciplines. For example, sequencers were used to list discourse elements such as research results or limitations (Examples 14 and 15), topicalizers to mark the beginning of new topics (Example 16), discourse-labels to signal the stage of the unfolding discourse (Example 17), and announcers to outline the discourse goals (Example 18).

(14) 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). (EDU/QUAN17)

(15) Several study limitations should be acknowledged. **First**, interviewers were not blind to vocational program assignment, introducing the possibility of rater bias. (PSY/QUAN02)

(16) **With regard to** relational factors that can contribute to conflict, supervisors mentioned the evaluative nature of supervision and concomitant power differential as critical factors. (PSY/QUAL12)

(17) **In summary**, anhedonic depressive tendencies negatively predicted other-directed violence and positively predicted self-directed violence both in men and in women. (PSY/QUAN17)

(18) I **will now** refer to microgenesis instances where participants co-create learning affordances which are not based on corrective feedback. (APL/QUAL07)

While the above examples illustrate the function of each individual subtype, our textual analyses revealed that these metadiscoursal devices often worked jointly to frame the propositional content and structure the texts.

5.4 Endophoric markers

The ANOVA run on endophoric markers found a significant main effect of paradigm, $F(1, 114) = 6.004$, $p = .022$, $\eta_p^2 = .050$. Similarly, a significant effect of discipline was found, $F(2, 114) = 6.534$, $p = .002$, $\eta_p^2 = .103$. There was also a significant interaction between paradigm and discipline, $F(2, 114) = 3.336$, $p = .039$, $\eta_p^2 = .055$. As can be seen from Table 3, the interaction occurred mainly because of the qualitative RAs' markedly greater variations across the three disciplines, when compared with those of the quantitative RAs. Further analyses conducted for the subtype of linear references detected a significant main effect of discipline, $F(2, 114) = 13.157$, $p < .001$, $\eta_p^2 = .188$, though the effect of paradigm was non-significant, $F(1, 114) = 0.557$, $p = .457$, $\eta_p^2 = .005$. The discipline/paradigm interaction was also non-significant, $F(2, 114) = 0.273$, $p = .762$, $\eta_p^2 = .005$. Post hoc comparisons revealed that both applied linguistics ($M = 1.06$, $SD = 0.81$) and education RAs ($M = 0.83$, $SD = 0.70$) used significantly ($p < .001$ and $p = .002$ respectively) more linear references than the psychology RAs ($M = 0.33$, $SD = 0.37$), whereas the former two disciplines did not differ from each other ($p = .272$). As regards non-linear references, the ANOVA yielded a significant effect of paradigm, $F(1, 114) = 9.673$, $p = .002$, $\eta_p^2 = .078$, but no significant main effect of discipline was uncovered, $F(2, 114) = 2.279$, $p = .107$, $\eta_p^2 = .038$. However, a significant interaction between paradigm and discipline was found, $F(2, 114) = 4.120$, $p = .019$, $\eta_p^2 = .067$. The interaction occurred because while there was little disciplinary variation in the quantitative RAs, the qualitative RAs exhibited much variance between the applied linguistics and education RAs on the one hand and the psychology RAs on the other.

A close qualitative examination revealed that linear references were commonly used across the disciplines to give a preview (Example 19), a review (Example 20) or an overview (Example 21):

(19) **In the following subsection**, we consider a variety of possibilities and whether they might be beneficial as well as practical, given the realities of the instructional context. (APL/QUAL17)

(20) **As previously noted**, the church was cited as a source of dogma and judgment in developing early notions of being Christian and in stifling growth as an ally. (PSY/QUAN15)

(21) **This article** has brought a micro-interactional perspective to bear on a perennial problem in school reform policy and research. (EDU/QUAL08)

As illustrated above, the use of linear references allowed the authors to anticipate their readers' information processing needs and provide necessary textual signposts to help them locate specific information.

While non-linear references occurred in both quantitative and qualitative RAs, they appeared to be used differently. As shown in the following examples, authors of quantitative RAs preferred to make references to tables (Example 22) and figures (Example 23) for statistical results or patterns:

(22) **The last column of Table 2** shows the test for the differences among these three models. (PSY/QUAN02)

(23) **Figure 4** shows the average time spent studying examples 1 and 2 as a function of prompt. (EDU/QUAN10)

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, episodes, examples, and extracts (Examples 24 and 25). In addition, a survey of the corpus revealed that most of the tables in the quantitative RAs included numerical information, such as descriptive and inferential statistics, whereas those in the qualitative RAs presented mostly verbal information, such as examples and summaries of thematic data. 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.

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

(25) 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)

5.5 Evidential markers

The ANOVA on evidential markers found neither a significant main effect of paradigm, $F(1, 114) = 3.275$, $p = .073$, $\eta_p^2 = .028$, nor a significant effect of discipline, $F(2, 114) = 0.526$, $p = .592$, $\eta_p^2 = .009$. In addition, the interaction between discipline and paradigm was non-significant, $F(2, 114) = 0.871$, $p = .421$, $\eta_p^2 = .015$. Further analyses uncovered a significant main effect of discipline on integral citations, $F(2, 114) = 7.271$, $p = .001$, $\eta_p^2 = .113$. Post hoc comparisons showed that integral citations occurred significantly more frequently in the applied linguistics RAs ($M = 1.77$, $SD = 1.43$) than in the education RAs ($M = 1.03$, $SD = 1.07$; $p = .014$) and the psychology RAs ($M = 0.84$, $SD = 0.84$; $p = .001$). RAs in the latter two disciplines did not show any significant difference ($p = .737$). By contrast, paradigm was not found to have a significant main effect on integral citations, $F(1, 114) = 0.446$, $p = .506$, $\eta_p^2 = .004$. Neither was the discipline/paradigm interaction significant, $F(2, 114) = .135$, $p = .874$, $\eta_p^2 = .002$. As regards non-integral citations, the ANOVA did not locate a significant main effect of paradigm, $F(1, 114) = 3.255$, $p = .074$, $\eta_p^2 = .028$, or a significant main effect of discipline, $F(2, 114) = 2.373$, $p = .098$, $\eta_p^2 = .040$. There was no significant interaction between paradigm and discipline, $F(2, 114) = 1.803$, $p = .169$, $\eta_p^2 = .031$.

Apart from the quantitative cross-disciplinary differences in the use of integral citations reported above, a closer look at the textual data also revealed some qualitative differences. Notably, there was a clear tendency in the applied linguistics RAs to quote directly from a cited source:

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

(27) **According to Slobin**, "children are guided by the set of grammaticalized distinctions in the language to attend to such features of events while speaking" (1996, p.89). (APL/QUAN01)

Although they were not absent from the education and psychology RAs, direct quotations were much less frequent. Instead, when citing other sources, authors from these two disciplines tended to assimilate cited information into citing sentences by paraphrasing or summarizing, as shown in Examples 28 and 29 below. The psychology RAs also showed a preference for non-integral citations, where the cited authors appeared in parentheses rather than being integrated syntactically into the citing sentences (Example 29).

(28) 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)

(29) In addition, research has demonstrated that attachment to parents has been linked to college student adjustment **(Larose & Boivin, 1998; Mattanah et al., 2004; Vivona, 2000**). (PYS/QUAN05)

To summarize, our quantitative and qualitative analyses identified clear cross-paradigmatic and cross-disciplinary differences in the use of interactive metadiscourse in our corpus. Table 4 presents a summary of the observed quantitative differences. There were statistically significant cross-paradigmatic differences in the incidence of reformulators, comparative and inferential transitions, sequencers, and non-linear references. Figure 1 shows that the quantitative RAs used these interactive resources markedly more frequently than the qualitative RAs. As can be seen from both Table 4 and Figure 2, there were also clear cross-disciplinary differences in specific subtypes of interactive metadiscourse. The applied linguistics RAs employed comparative transitions, linear references, and integral citations more frequently than the psychology RAs. The applied linguistics RAs also used integral citations more often than the education RAs. The latter had a greater incidence of linear references but a lower frequency of exemplifiers than the psychology RAs. As shown in the last column of Table 4, there was a significant interaction between discipline and paradigm in the use of non-linear references. Because a preponderance of endophoric markers comprised non-linear references, the same interaction pattern occurred in endophoric markers as a group.

[Insert Table 4 about here]

[Insert Figure 1 about here]

[Insert Figure 2 about here]

6. Discussion

6.1 Paradigmatic influences on interactive metadiscourse

As reported in the preceding section, there were marked cross-paradigmatic differences in the use of reformulators, comparative and inferential transitions, sequencers, and non-linear references, with the quantitative RAs using all these interactive resources more frequently than the qualitative RAs. These differences are consistent with the distinct epistemologies and knowledge-making practices that prevail in the two research paradigms, respectively. First, 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 (Johnson and Christensen, 2012; Russo, 2008), whereas qualitative research is underpinned by a constructivist and interpretivist epistemology that prioritizes participant meanings and aims to develop contextualized understandings of "personal, cultural, and historical experiences" (Creswell, 2009:8). From a (post)positivist perspective, causality can be determined in part by establishing logical relationships among propositions and variables. In this regard, comparative and inferential transitions are important logical markers or metadiscoursal 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 8 – 12 presented in the preceding section. 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 and Lincoln, 1989:86) and aims to produce "qualitative/subjective description, empathetic understanding, and exploration" of human thoughts, behaviors, and experiences as "situational, social, contextual, personal, and unpredictable" (Johnson and Christensen, 2012:34). Consequently, there would be fewer opportunities in qualitative RAs than in their quantitative counterparts to use comparative and inferential transitions to compare/contrast observed results with a priori expectations or to establish causal generalizations.

Second, apart from verbal exposition of logical relationships between propositions, quantitative research typically establishes causality through determining statistical links between hypothesized causes and effects (Cohen et al., 2011; Russo, 2008). By employing predetermined and structured instruments of data collection for precise measurement (Johnson and 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 and Woolgar, 1986:51) are so pervasive in quantitative RAs that Smith et al. characterize graphism as "a hallmark of science" (2002:754) and the use of numerical tables as an index of "the quantitativeness of scientific fields" (2002:756). 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., 2011:7), 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 (e.g., examples, excerpts, and episodes) and meaning, as was revealed by our textual analyses of the qualitative RAs. These differences in knowledge-making practices between quantitative and qualitative research could account for the markedly more frequent use in the quantitative RAs of non-linear references which, as illustrated by

Examples 22 and 23, were predominantly statistical tables and figures.

Third, 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 (2009:7), 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 attested to by Examples 14 and 15. 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., 2011:28). 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.

Finally, the more frequent use of reformulators in the quantitative RAs can be also 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 4 and 5. 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 Example 6. Qualitative research, by contrast, aims to inductively develop "a pattern of meaning" (Creswell, 2009:8) 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 and 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.

6.2 Disciplinary influences on interactive metadiscourse

As reported earlier, the three disciplines examined in this study were found to differ in the use of several interactive metadiscoursal resources, including exemplifiers, comparative transitions, linear references, and integral citations. The cross-disciplinary differences existed mainly between applied linguistics on the one hand and psychology on the other. These differences could be plausibly explained in terms of the knowledge-knower structure prevailing in each of the disciplines and their

preferred “languages of legitimation” (Maton, 2000:147). In his characterization of the underlying structuring principles of specialized knowledge, Bernstein (1996, 1999) distinguishes between hierarchical and horizontal knowledge structures. Characteristic of the natural sciences, hierarchical knowledge structures give rise to “an explicit, coherent, systematically principled and hierarchical organization of knowledge” (1996:172) and aim to create highly general propositions and theories by integrating knowledge at lower levels across a diverse range of phenomena. Typical of the humanities, horizontal knowledge structures, on the other hand, “consist of a series of specialised languages with specialised modes of interrogation and criteria” (1999:162) governed by “non-comparable principles of description based on different, often opposed, assumptions” (1996:173). Extending Bernstein’s work, Maton (2007) argues that there is also a knower structure for every knowledge structure. Knower structures are hierarchical if knowledge claims by authors (i.e., knowers) are predicated on their voice, namely, their “subjective or intersubjective attributes and personal experiences” (Maton, 2000:157). In horizontal knower structures, however, the validity of knowledge claims made by knowers depends on scientific procedures and criteria that are independent of personal attributes. For our practical purpose, 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 modes of specialization characterized, respectively, as the knowledge and knower codes (Maton, 2007). Figure 3 is a schematic representation of the continuum of knowledge-knower structures and the relative positions taken by the disciplines examined in this study. Although all three disciplines are social sciences and occupy the middle ground of the continuum (Wignell, 2007), psychology is most knowledge-oriented (Harper, 2008; Madigan et al, 1995), and applied linguistics most knower-oriented (Hood, 2011; Moed, 2005).

[Insert Figure 3 about here]

The more frequent use of exemplifiers by the psychology RAs, as compared with the education RAs, can be interpreted in terms of the dominant knowledge-knower 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 phenomena at lower levels into more general 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, as illustrated by Example 3. Exemplifiers can pre-empt or alleviate such problems by illustrating through examples. Furthermore, as Hyland (2007:281) 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” (see also Example 1). On the other hand, the stronger knower orientation (i.e., a more horizontal knowledge structure combined with a more hierarchical knower

structure) of applied linguistics could readily account for its more frequent use of comparative transitions than psychology. As Maton (2010:54) observes, knower-oriented disciplines are constantly in the process of "proliferation and fragmentation" which "emphasizes *difference from* rather than *similarity with*." Consistent with this tendency and as demonstrated by Example 9, the majority of comparative transitions in our corpus expressed contrastive relations (e.g., *however*, *but*) which could be used to emphasize the knower's distinct voice, align or dis-align readers with alternative positions (Hood, 2010), and create knowledge claims in the knower code.

By the same token, the stronger knower orientations of applied linguistics and education provide a plausible explanation for the more frequent use of integral citations by the applied linguistics RAs than by the psychology RAs and the greater frequency of linear references in the applied linguistics and education RAs than in the psychology RAs. As Maton (2007, 2010) points out, knowers' personal attributes, in particular, their own voice, 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. The visibility of knowers can be metadiscoursally enhanced not only by comparative transitions, as discussed above, but also through the use of integral citations and linear references. 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, 1999:359) and foreground individual interpretations, alternative perspectives, and human agency in knowledge construction. The attitudes and dispositions of knowers can also be made more prominent by the use of direct quotations, which occurred markedly more frequently in the applied linguistics RAs than in the psychology RAs (see Examples 26, 27, and 29). Although they do not make direct references to authors, such linear references as *in the following subsection* and *this article* imply their status as knowers, as exemplified by Examples 19 and 21. 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, 2000:154) between knowledge and its author in these more knower-oriented disciplines than in the more knowledge-oriented discipline of psychology. Arguably, 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 (Madigan et al., 1995), and consequently "no extra processing effort is needed by the expert reader to orient him- or herself within the text" (Dahl, 2004:1819). This would reduce the need for psychology authors to make orienting references to their texts.

7. Conclusion

This study aimed to explore paradigmatic and disciplinary influences on the use of interactive metadiscourse in RAs. By examining various types and subtypes of interactive metadiscourse in a corpus of 120 RAs, we found clear evidence of paradigm-specific use of reformulators, comparative

transitions, inferential transitions, sequencers, and non-linear references between the post-method sections of the quantitative and qualitative RAs. Meanwhile, we also uncovered discipline-specific influences on the use of exemplifiers, comparative transitions, linear references, and integral citations in the post-method sections of RAs in the social science disciplines of applied linguistics, education, and psychology. We interpreted the cross-paradigmatic differences in interactive metadiscourse in terms of the (post)positivist and the constructivist epistemologies that dominate quantitative and qualitative research respectively in the three disciplines. Drawing on the work of Bernstein and Maton on the discourses of specialized knowledge in intellectual fields, we accounted for the identified cross-disciplinary differences with reference to the knowledge-knower structures that prevail in the disciplines.

The results of this study need to be understood along with recognition of its methodological limitations. First, the RAs in our corpus were sampled from only a limited number of journals in the subfields of three social sciences. This may constrain the generalizability of our empirical findings. Given the vast and diverse terrains of the social sciences, it would be necessary for further research to include more disciplines and their subfields to replicate our findings and delimit the scope of the analytic generalizations achieved in our study. Second, while this study focused on interactive metadiscourse in the post-method sections of RAs, it would be useful in further research to map an analysis of metadiscourse onto an analysis of rhetorical moves (see Del Saz Rubio, 2011) so that we can achieve a better understanding of how academic writers deploy metadiscoursal strategies to achieve their rhetorical purposes step by step. Finally, metadiscourse use in RAs is subject to complex epistemological and socio-cultural influences which could only be partially revealed by a corpus-based study like ours. Further research should incorporate in-depth qualitative methods of inquiry such as ethnography and textography involving specialist informants to investigate how insiders from specific communities of discourse practices perceive and respond to the use of these rhetorical resources (Hyland, 2000). To balance our external lenses as corpus analysts with the internal perspectives of disciplinary insiders has the potential to lead to more nuanced and situated understandings of how interactive metadiscourse contributes to the languages of legitimation in various intellectual fields.

References

Abdi, Reza, 2002. Interpersonal metadiscourse: an indicator of interaction and identity. Discourse Studies 4, 139-145.

Abdi, Reza, Rizi, Manoochehr Tavangar, Tavakoli, Mansoor, 2010. The cooperative principle in discourse communities and genres: a framework for the use of metadiscourse. Journal of Pragmatics 42, 1669-1679.

Abdollahzadeh, Esmaeel, 2011. Poring over the findings: interpersonal authorial engagement in

applied linguistics papers. Journal of Pragmatics 43, 288-297.

Ädel, Annelie, 2006. Metadiscourse in L1 and L2 English. John Benjamins, Amsterdam.

Ädel, Annelie, Mauranen, Anna, 2010. Metadiscourse: diverse and divided perspectives. Nordic Journal of English Studies 9(2), 1-11.

Aguilar, Marta, 2008. Metadiscourse in Academic Speech: A Relevance-Theoretic Approach. Peter Lang, Bern.

Alise, Mark A., Teddlie, Charles, 2010. A continuation of the paradigm wars? Prevalence rates of methodological approaches across the social/behavioral sciences. Journal of Mixed Methods Research 4, 103-126.

Becher, Tony, & Trowler, Paul R, 2001. Academic Tribes and Territories: Intellectual Enquiry and the Culture of Disciplines (2nd ed.). Society for Research into Higher Education & Open University Press, Buckingham.

Beauvais, Paul J, 1989. A speech act theory of metadiscourse. Written Communication 6, 11-30.

Benson, Phil, Chik, Alice, Gao, Xuesong, Huang, Jing, & Wang, Wenfeng, 2009. Qualitative research in language teaching and learning journals, 1997-2006. The Modern Language Journal 93, 79-90.

Bernstein, Basil, 1996. Pedagogy, Symbolic Control and Identity: Theory, Research, Critique. Taylor & Francis, London.

Bernstein, Basil, 1999. Vertical and horizontal discourse: an essay. British Journal of Sociology of Education 20, 157-173.

Biber, Douglas, Johansson, Stig, Leech, Geoffrey, Conrad, Susan, & Finegan, Edward, 1999. Longman Grammar of Spoken and Written English. Longman, London.

Blakemore, Diane, 2002. Relevance and Linguistic Meaning: the Semantics and Pragmatics of Discourse Markers. Cambridge University Press, Cambridge.

Bunton, David, 1999. The use of higher level metatext in Ph.D theses. English for Specific Purposes 18, S41-S56.

Carter, Stacy M, Little, Miles, 2007. Justifying knowledge, justifying method, taking action: epistemologies, methodologies, and methods in qualitative research. Qualitative Health Research 17, 1316-1328.

Cohen, Jacob, 1988. Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Lawrence Erlbaum, Mahwah.

Cohen, Louis, Manion, Lawrence, Morrison, Keith, 2007. Research Methods in Education (7th ed.). Routledge, London.

Creswell, John W, 2009. Research Design: Qualitative, Quantitative, and Mixed Methods Approach (3rd ed.). SAGE, Los Angeles.

Cuenca, Maria Josep, Bach, Carme, 2007. Contrasting the form and use of reformulation markers. Discourse Studies 9, 149-175.

Dahl, Trine, 2004. Textual metadiscourse in research articles: a marker of national culture or of

academic discipline? Journal of Pragmatics 36, 1807-1825.

Del Saz Rubio, M Milagros, 2011. A pragmatic approach to the macro-structure and metadiscoursal features of research article introductions in the field of agricultural sciences. English for Specific Purposes 3, 258-271.

Field, Andy, 2009. Discovering Statistics with SPSS (3rd ed.). SAGE, London.

Firestone, William A, 1987. Meaning in method: the rhetoric of quantitative and qualitative research. Educational Researcher 16, 16-21.

Fuertes-Olivera, Pedro A, Velasco-Sacristán, Marisol, Arribas-Baño, Ascensión, Samaniego-Fernández, Eva, 2001. Persuasion and advertising English: metadiscourse in slogans and headlines. Journal of Pragmatics 33, 1291-1307.

Gardezi, S Amina, Nesi, Hilary, 2009. Variation in the writing of economics students in Britain and Pakistan: the case of conjunctive ties. In: Charles, M., Pecorari, D., Hunston, S. (Eds.), Academic Writing: At the Interface of Corpus and Discourse. Continuum, London, pp. 236-250.

Guba, Egon G, 1990. The alternative paradigm dialog. In: Guba, E. G. (Ed.), The Paradigm Dialog. SAGE, Newbury Park, pp. 17-27.

Guba, Egon G., Lincoln, Yvonna S, 1989. Fourth Generation evaluation. SAGE, Newbury Park.

Guba, Egon G., Lincoln, Yvonna S, 2005. Paradigmatic controversies, contradictions, and emerging confluences. In: Denzin, N.K., Lincoln, Y.S. (Eds.), The SAGE Handbook of Qualitative Research (3rd ed.). SAGE, Thousand Oaks, pp. 191-215.

Habermas, Jürgen, 1971. Knowledge and Human Interests. Beacon Press, London.

Halliday, M A K, Hasan, Ruqaiya, 1976. Cohesion in English. Longman, London.

Hansen, Kristine, 1988. Rhetoric and epistemology in the social sciences: a contrast of two representative texts. In: Jolliffe, D.A. (Ed.), Writing in Academic Disciplines. Ablex, Norwood, pp. 167-210.

Harper, David, 2008. Clinical psychology. In: Willig, C., Stainton-Rogers, W. (Eds.), The SAGE Handbook of Qualitative Research in Psychology. SAGE, London, pp. 430-454.

Hempel, Susanne, Degand, Liesbeth, 2008. Sequencers in different text genres: academic writing, journalese and fiction. Journal of Pragmatics 40, 676-693.

Holliday, Adrian, 2007. Doing and Writing Qualitative Research (2nd ed.). SAGE, London.

Hood, Susan, 2010. Appraising Research: Evaluation in Academic Writing. Palgrave Macmillan, Basingstoke.

Hood, Susan, 2011. Writing discipline: comparing inscriptions of knowledge and knowers in academic writing. In Frances, C., Maton, K. (Eds.), Disciplinarity: Functional Linguistic and Sociological Perspectives. Continuum, London, pp. 106-128.

Hu, Guangwei, Wang, Guihua, 2014. Disciplinary and ethnolinguistic influences on citation in research articles. Journal of English for Academic Purposes 14, 14-28.

Hyland, Ken, 1998a. Boosting, hedging and the negotiation of academic knowledge. Text 18, 349-382.

Hyland, Ken, 1998b. Persuasion and context: the pragmatics of academic metadiscourse. Journal of Pragmatics 30, 437-455.

Hyland, Ken, 1999. Academic attribution: citation and the construction of disciplinary knowledge. Applied Linguistics 20, 341-367.

Hyland, Ken, 2000. Disciplinary Discourses: Social Interactions in Academic Writing. Longman, Harlow.

Hyland, Ken, 2005a. Metadiscourse: Exploring Interaction in Writing. Continuum, London.

Hyland, Ken, 2005b. Stance and engagement: a model of interaction in academic discourse. Discourse Studies 7, 173-192.

Hyland, Ken, 2007. Applying a gloss: exemplifying and reformulating in academic discourse. Applied Linguistics 28, 266-285.

Hyland, Ken, & Tse, Polly, 2004. Metadiscourse in academic writing: a reappraisal. Applied Linguistics 25, 156-177.

Ifantidou, Elly, 2005. The semantics and pragmatics of metadiscourse. Journal of Pragmatics 37, 1325-1353.

ISI Web of Science, 2011. Journal Citation Reports: Social Science Edition. Thomson Reuters, New York.

Khedri, Mohsen, Chan, Swee Heng, & Ebrahimi, Seyed Foad, 2013. An exploration of interactive metadiscourse markers in academic research article abstracts in two disciplines. Discourse Studies 15, 319-331.

Kidd, Sean A, 2002. The role of qualitative research in psychological journals. Psychological Methods 7, 126-138.

Kuhn, Thomas S, 1970. The Structure of Scientific Revolutions (2nd ed.). The University of Chicago Press, Chicago.

Johnson, Burke, Christensen, Larry, 2012. Educational Research: Quantitative, Qualitative, and Mixed Approaches (4th ed.). SAGE, Thousand Oaks.

Latour, Bruno, Woolgar, Steve, 1986. Laboratory Life: The Construction of Scientific Facts. Princeton University Press, Princeton.

Lin, Ling, & Evans, Stephen, 2012. Structural patterns in empirical research articles: a cross-disciplinary study. English for Specific Purposes 31, 150-160.

Madigan, Robert, Johnson, Susan, Linton, Patricia, 1995. The language of psychology: APA style as epistemology. American Psychologist 50, 428-436.

Martin, James Robert, Rose, David, 2003. Working with Discourse: Meaning Beyond the Clause. Continuum, London.

Maton, Karl, 2000. Languages of legitimation: the structuring significance for intellectual fields of strategic knowledge claims. British Journal of Sociology of Education 21, 147-167.

Maton, Karl, 2007. Knowledge-knower structures in intellectual and educational fields. In: Christie,

F., Martin, J.R. (Eds.), Knowledge, Power and Educational Reform: Applying the Sociology of Basil Bernstein. Continuum, London, pp. 87-108.

Maton, Karl, 2010. Analysing knowledge claims and practices: languages of legitimation. In: Maton, K., Moore, R. (Eds.), Social Realism, Knowledge and the Sociology of Education: Coalitions of the Mind. Continuum, London, pp. 35-59.

Mauranen, Anna, 1993. Cultural Differences in Academic Rhetoric: A Textlinguistic Study. Peter Lang, Frankfurt am Main.

McGrath, Lisa, Kuteeva, Maria, 2012. Stance and engagement in pure mathematics research articles: linking discourse features to disciplinary practices. English for Specific Purposes 31, 161-173.

Moed, Henk F, 2005. Citation Analysis in Research Evaluation. Springer, Dordrecht.

Mur Dueñas, Pilar, 2009. Logical markers in L1 (Spanish and English) and L2 (English) business research articles. English Text Construction 2, 246-264.

Mur Dueñas, Pilar, 2011. An intercultural analysis of metadiscourse features in research articles written in English and in Spanish. Journal of Pragmatics 43, 3068-3079.

Murillo, Silvia, 2004. A relevance reassessment of reformulation markers. Journal of Pragmatics 36, 2059-2068.

O'Donnell, Mick, 2012. UAM CopusTool: Text Annotation for the 21st Century. Retrieved June 1, 2012, from http://www.wagsoft.com/CorpusTool/index.html

Peacock, Matthew, 2010. Linking adverbials in research articles across eight disciplines. Ibérica 20, 9-34.

Peterlin, Agnes Pisanski, 2005. Text-organizing metatext in research articles: an English-Slovene contrastive analysis. English for Specific Purposes 24, 307-319.

Russo, Federica, 2008. Causality and Causal Modelling in the Social Sciences: Measuring Variations. Springer, Dordrecht.

Sallinen, Riitta, & Braidwood, Eva, 2009. Distinctive linguistic features of qualitative and quantitative research reporting: comparing research papers in nursing science. In Ferenčík, M., Horváth, J. (Eds.), Language, Literature and Culture in a Changing Transatlantic World. University of Prešov Press, Prešov, pp. 202-215.

Smith, Laurence D, Best, Lisa A, Stubbs, D Alan, Archibald, Andrea Bastiani, Roberson-Nay, Roxann, 2002. Constructing knowledge: the role of graphs and tables in hard and soft psychology. American Psychologist 57, 749-761.

Swales, John M., 1990. Genre Analysis: English in Academic and Research Settings. Cambridge University Press, Cambridge.

Teddlie, Charles, & Yu, Fen, 2007. Mixed-methods sampling: a typology with examples. Journal of Mixed Methods Research 1, 77-100.

Vande Kopple, William J., 1985. Some exploratory discourse on metadiscourse. College Composition and Communication 36, 82-93.

White, Howard D, 2011. Relevance theory and citations. Journal of Pragmatics 43, 3345-3361.

Wignell, Peter, 2007. Vertical and horizontal discourse and the social sciences. In Chirstie, F., Martin, J.R. (Eds.), Language, Knowledge and Pedagogy: Functional Linguistics and Sociological Perspectives. Continuum, London, pp. 184-204.

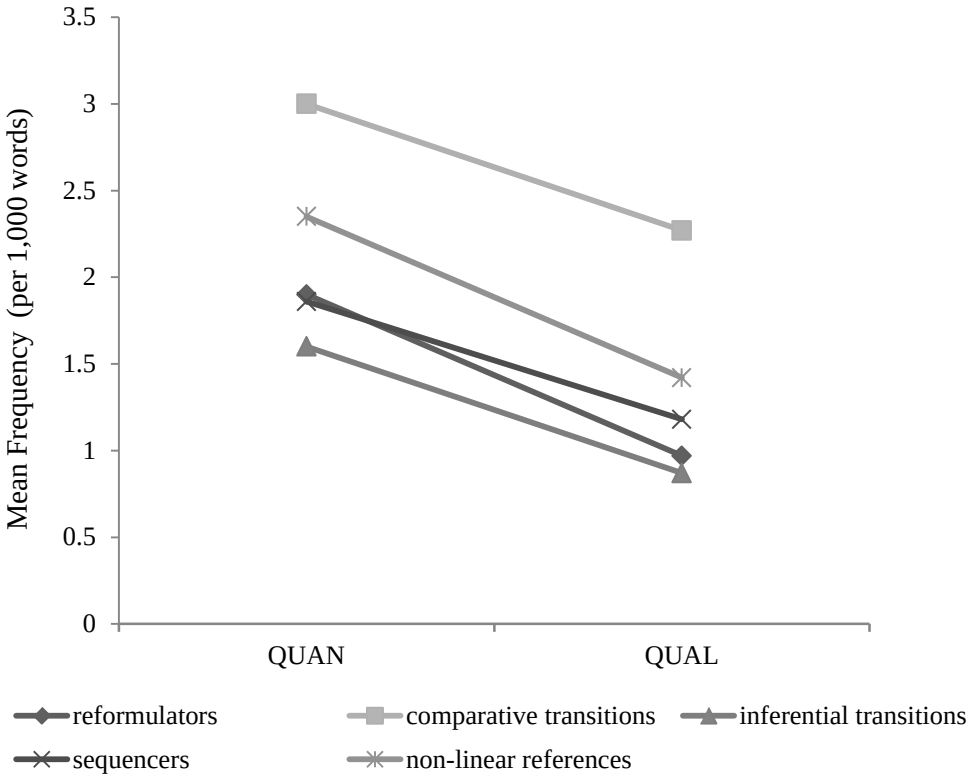

Figure 1. Mean frequency of interactive metadiscourse by research paradigm

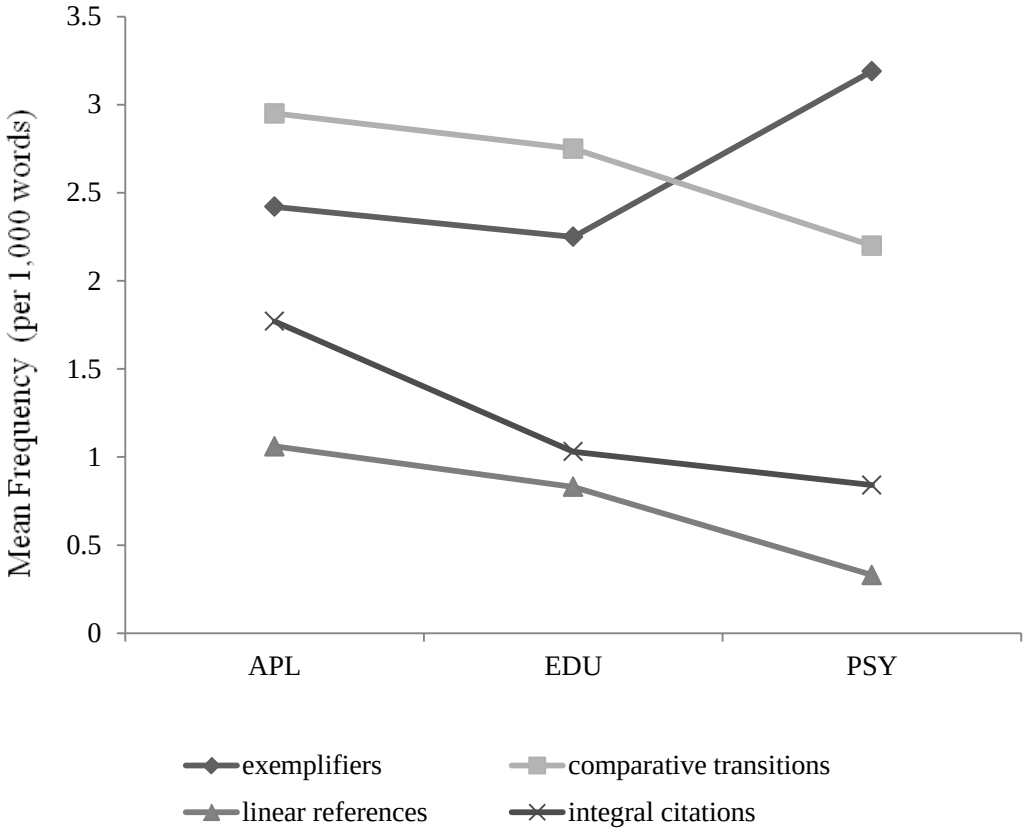

Figure 2. Mean frequency of interactive metadiscourse by discipline

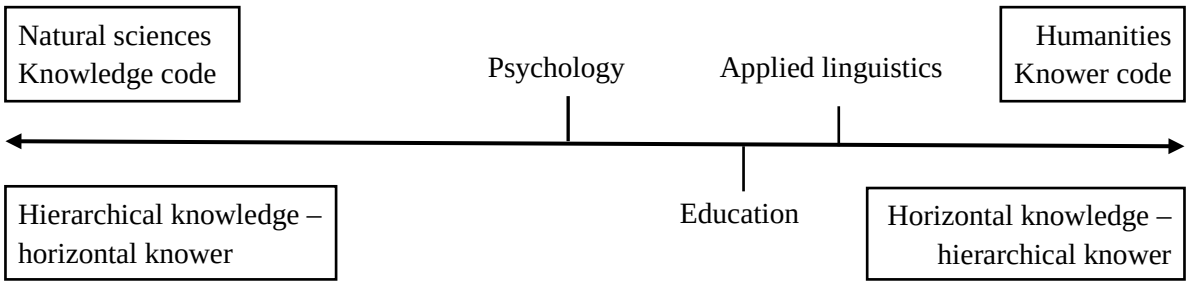

Figure 3. The three disciplines' relative positions on the continuum of knowledge-knower structures

Table 1

An Analytical Framework for Interactive Metadiscourse

Interactive type	Subtype	Function	Example
Code glosses	Exemplifiers	to elaborate meaning with examples to	*for example, for instance, e.g.*
	Reformulators	rephrase a previous discourse unit	*in other words, that is, i.e.*
Transitional markers	Additive transitions	to express relations of addition	*in addition, furthermore, moreover*
	Comparative transitions	to express relations of comparison or contrast	*similarly, however, in contrast*
	Inferential transitions	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, I 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]

Table 2

Descriptive Statistics for the Corpus

	Quantitative research			Qualitative research		
	RA	No. of words	*M*	RA	No. of words	*M*
Applied linguistics	20	80,120	4,006	20	97,644	4,882
Education	20	67,567	3,378	20	140,150	7,008
Psychology	20	69,572	3,479	20	100,810	5,041
Total	60	217,259	3,621	60	338,604	5,643

Table 3

Descriptive Statistics for Interactive Metadiscourse by Paradigm and Discipline

	Quantitative research						Qualitative research						All subcorpora combined	
	App. linguistics		Education		Psychology		App. linguistics		Education		Psychology			
Type & Subtype	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Code glosses	4.09	2.53	4.15	1.77	4.95	2.60	3.50	2.19	3.45	1.64	4.32	2.40	4.08	2.23
Exemplifiers	2.39	1.78	2.00	0.98	3.06	2.00	2.45	1.79	2.49	1.36	3.33	2.18	2.62	1.75
Reformulators	1.71	1.15	2.10	1.06	1.89	1.26	1.05	1.09	0.86	0.68	0.99	0.85	1.43	1.12
Transitional markers	6.21	2.40	6.15	2.65	5.38	2.33	4.81	1.69	4.16	1.86	3.86	1.77	5.10	2.29
Additive	1.08	0.71	1.52	1.14	1.33	1.13	1.12	0.66	1.02	0.82	1.30	0.91	1.23	0.91
Comparative	3.16	1.63	3.23	1.45	2.60	0.96	2.73	1.28	2.28	0.99	1.79	0.70	2.63	1.29
Inferential	1.96	1.17	1.40	1.13	1.43	0.93	0.96	0.61	0.86	0.54	0.78	0.87	1.23	0.98
Frame markers	2.74	1.88	3.29	2.24	2.58	1.57	2.02	1.20	2.10	1.62	1.34	1.08	2.35	1.72
Sequencers	1.50	1.22	2.27	1.96	1.80	1.26	1.23	1.06	1.34	1.20	0.96	0.85	1.52	1.35
Topicalizers	0.55	0.77	0.36	0.54	0.36	0.53	0.28	0.35	0.16	0.22	0.12	0.13	0.30	0.49
Discourse-labels	0.34	0.34	0.47	0.45	0.41	0.42	0.21	0.22	0.21	0.26	0.22	0.36	0.31	0.36
Announcers	0.35	0.67	0.18	0.30	0.02	0.07	0.28	0.36	0.39	0.57	0.04	0.10	0.21	0.43
Endophoric markers	3.19	1.61	3.13	1.07	2.80	1.45	3.11	2.79	2.78	2.60	0.73	0.67	2.62	2.02
Linear	0.96	0.76	0.84	0.64	0.30	0.39	1.17	0.85	0.83	0.76	0.36	0.36	0.74	0.71
Non-linear	2.24	1.14	2.30	0.81	2.50	1.27	1.94	2.42	1.94	2.46	0.37	0.62	1.88	1.74
Evidential markers	4.39	2.71	4.46	2.31	5.05	2.25	4.41	2.69	3.39	2.45	3.75	1.79	4.24	2.40
Integral	1.91	1.50	1.08	0.95	0.85	1.01	1.62	1.38	0.97	1.20	0.82	0.67	1.21	1.20
Non-integral	2.48	1.98	3.38	2.18	4.21	1.93	2.78	2.11	2.41	1.95	2.92	1.61	3.03	2.02
Total	20.63	7.04	21.18	5.66	20.76	6.20	17.86	4.54	15.87	4.98	14.00	5.41	18.39	6.21

Table 4

Summary of Statistically Significant Comparisons

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

–