An Analysis of Metadiscourse in the Abstracts of English Academic Papers

Lichan Wang[1]

[1] Northwestern Polytechnical University

Abstract

As an important part in academic writing, meta discourse has got considerable attention in recent years. Abstract plays an important role in academic writings and it reflects the main contents of the whole papers. Based on the theory of metadiscourse and the classifications of Hyland, this study compared the different frequency and usage of metadiscourse in mathematical and linguistic academic papers. Two small abstracts corpora were compiled in this study including 30 mathematical and 30 linguistic abstracts of academic papers from Social Science Citation Index (SSCI) and Science Citation Index (SCI) journals. The results showed that there appeared more metadiscourse in the abstracts of linguistic academic papers than mathematical academic papers. Interactive meta discourse was adopted more than interactional metadiscourse in abstracts of the two disciplines. In the use of interactive meta discourse, both disciplines demonstrated the same trends in the frequencies of five sub-categories. Regarding interactional metadiscourse, hedges were the most frequently used meta discourse markers in linguistic academic papers while self mentions were most frequently used in mathematics. It is suggested that more interactive meta discourse should be used in abstracts of both arts and science academic papers.

Index terms— abstract, metadiscourse, academic writing.

1 Introduction

s an important part in academic papers, abstracts are not only the summaries of the whole papers but also play important roles in attracting readers and providing the main research contents (Ge & Yang, 2005). As a result, many studies have been carried out from different aspects such as the analyses of move?pronoun?genre and so on ??Xiao & Cao, 2014; ??hang, 2008;Ge & Yang, 2005). According to Wang & Cheng (2016), abstract is a kind of discourse and discourse can be divided into basic discourse and meta discourse. Therefore, the features of abstracts can be discourse. The concept of meta discourse was put forward by Zellig Harris in 1959 (Hyland, 2008). However, he didn't give the exact definition of metadiscourse. Instead, the term "metadiscourse" was proposed by Williams in 1981. He defined metadiscourse as "discourse about discourse, whatever does not refer to the subject matter being addressed." (Williams, 1981). Similarly, Vande Kopple (1985) defined metadiscourse as "the linguistic material which does not add propositional information but which signals the presence of an author". Different from previous scholars, Hyland ??2000) defined matadiscourse as "the linguistic resources used to organize a discourse or the writer's stance towards either its content or the reader".

Many researches on metadiscourse can be found in China and abroad. Hyland (2004) analyzed the use of metadiscourse in graduate and doctor theses among different disciplines which provided directions for academic writing. A diachronic research on metadiscourse was conducted by Gillaerts and Van de Velde (2010) who found that the use of interactional metadiscourse had changed in the academic papers of applied linguistics within 30 years.

In China, the evaluation-assigning function of metadiscourse was discussed in the research of Xin and Huang (2010). They regarded metadiscourse as an important approach for written discourse analysis. In addition, Xin (2011) also analyzed the function of metadiscourse in intersubjectivity-constructing of academic texts. Besides, Huang and Xiong (2012) collected many news discourses and took a contrastive analysis by using English and Chinese news reports. Moreover, metadiscourse was analyzed from some other different aspects in China, such as classroom teaching (Guo, 2014), news discourse (Huang & Xiong, 2012), reports of government work (Lu, 2012) and so on. However, Analyses of metadiscourse in the abstracts of academic papers from different disciplines were still rare, though Zhou (2014) contrasted the usage of metadiscourse in abstracts between art and science; Sun and Tong contrasted the usage of metadiscourse in abstracts between Chinese and English (2015).

2   II.

3   Theoretical Foundation

Metadiscourse is a means of communication which is used by the author to organize discourse, express his attitude and make interaction with readers (Hyland, 2000). From the perspective of functional linguistics, communication not only includes the exchange of information, goods or services, but also includes the character, attitude and ideas of both sides (Liu, 2013). Therefore, Metadiscourse can help us to understand the speaker or author's attitudes towards the text and audience (Hyland, 2008). Hyland defined metadiscourse as a kind of "linguistic resources used to organize a discourse or the writer's stance towards either its content or the reader" (Hyland, 2000). Besides, he also came up with three basic principles of metadiscourse: "metadiscourse is distinct from propositional aspects of discourse; metadiscourse refers to aspects of the text that embody writer-reader interactions; metadiscourse refers only to relations which are internal to the discourse." (Hyland, 2008).

In the classification of metadiscourse, different opinions appeared in different journals. Vande Kopple (1985) Hyland disagreed with Crismore's classification. He believed the classification of textual metadiscourse and interpersonal metadiscourse separates the integrity of Halliday's three metafunction (Hyland, 2008). Thus Hyland's classification is an interpersonal model of metadiscourse which highlight the interpersonal features of metadiscourse.

4   III. Data collection and Research Method a) Data Collection

All the samples were collected from SSCI journals and SCI journals. The writer collected abstracts of linguistic and mathematical academic papers to build two small corpora. There are 12 journals, 6 for each discipline. All the abstracts were published within 5 years (from 2012 to 2016). Thirty linguistic abstracts and thirty mathematical abstracts were selected randomly from those 12 journals. Five abstracts were selected from each journal. The names of these journals are shown in table **??**.

Table **??**: Journals used in this study of linguistic and mathematical academic papers from the interactive and interactional metadiscourse subcategories? 3) What are the reasons for these differences? c) Research Procedures This research was carried out by following three steps: 1) Select 60 abstracts from the 12 journals to build two small corpora; 2) Set metadiscourse layers in the UAM Corpus Tool 3.0 (figure 1) and then import the texts into UAM Corpus Tool 3.0 and annotate the text in UAM Corpus Tool based on the metadiscourse layers;

3) Analyze the results and make a comparison of metadiscourse frequencies, percentage and other features between linguistic and mathematical abstracts.

5   Results and Discussion

The basic features of metadiscourse in abstracts of linguistic and mathematical academic papers are shown in table 3. There are 11090 tokens in the 60 abstracts in this research, 5365 tokens in linguistic abstracts and 5725 tokens in mathematical abstracts. The frequency of metadiscourse in these abstracts is 533, with 315 times in linguistic abstracts and 219 times in mathematical abstracts. The metadiscourse frequencies in the two disciplines take 58.99% and 41.01% of the total metadiscourse frequencies respectively. It can be seen that the total number of tokens in mathematical abstracts are more than the total number of tokens in linguistic abstracts (5725>5365), while the frequency of metadiscourse in mathematical abstracts is lower than that in linguistic abstracts (315>219).

The results indicate that the abstracts of arts academic papers use more metadiscourse to organize texts, establish the relationship between authors and readers. As linguistics and mathematics belong to different disciplines, there appears the different use of metadiscourse. Linguistics pays more attention to the author's opinions and their comments on the previous studies. In contrast, mathematics attaches more importance to show the research procedures and results. This means that mathematics concern more on the proposition itself. Table **??** shows the details of interactive and interactional metadiscourse features in abstracts of the two disciplines.

Interactive metadiscourse and interactional metadiscourse used in the abstracts of the two disciplines The frequencies of interactive and interactional metadiscourse in abstracts of linguistic academic papers are 170 times and 145 times respectively, with 124 times and 95 times in abstracts of mathematical academic papers

respectively. Interactive metadiscourse is used more frequently than interactional metadiscourse in the two disciplines (170>145, 124>95).

Interactive metadiscourse focus on the organization of discourse and it is mainly used for leading readers. The samples in this study are all abstracts which are the brief introductions to the whole paper without paying attention to the authors' opinions and interaction with readers. Therefore, the interactive metadiscourse is used more frequently than interactional meta-discourse in abstracts of linguistic and mathematical academic papers. In the use of the whole metadiscourse trends, the two disciplines are similar. However, there are still some differences in the use of specific metadiscourse markers.

6   a) The Distribution of Interactive Metadiscourse

Interactive metadiscourse shows the authors' thoughts in organizing discourse, which is useful for readers to understand the content. Table 5 shows the distribution of interactive metadiscourse in abstracts of linguistic and mathematical academic papers. It is shown in table 5 that transitions are the most frequently used markers in both linguistic and mathematical abstracts, with 79 times in the abstracts of linguistic academic papers and 75 in mathematical academic papers. The least frequently used markers in the abstracts of the two disciplines are endophoric markers, with 10 and 6 times in linguistics and mathematics papers respectively. Besides transitions and endophoric markers, the other markers are also used similar in the two disciplines. Details are shown in figure **??**.

Figure **??**: The interactive metadiscourse trends in the two disciplines Figure **??** shows the comparison of interactive metadiscourse used in the abstracts of linguistic and mathematical academic papers. The uses of interactive metadiscourse in the two disciplines are the same. Both of the two disciplines use a lot of transitions and a few endophoric markers. However, the percentages of transitions in the two disciplines are different. Figure **??** indicates that the transition markers take up 46.67% of the interactive metadiscourse in abstracts of linguistic academic papers, while 60.4% in abstracts of mathematical academic papers. It can be seen that transitions are used more frequently in the abstracts of mathematical academic papers.

Transitions play important roles in the coherence of texts and they show the relationships between clauses such as the relationship of addition, 0 20 40 60 80 100 contrast and cause and effect. What is more, transitions consist of conjunctions and adverbial phrases, and meanwhile they show the author's thinking patterns in different parts. Some words like "and, in addition, but, thus, however" and so on can all be seen as transitions. Table 5 and figure **??** both indicate that the abstracts of linguistic and mathematical academic papers are all coherent and logical. For example: 1. This dimension of classroom discourse, however, has not been studied systematically. (Linguistics) 2. This system is efficiently solved by a nested Newton type iterative scheme, and the resulting fluid volumes are assured to be non-negative and bounded from above by the available cell volumes. (Mathematics) The words "however" "and" in example 1 and 2 are both transitions. "However" shows the transition and negative in the sentence topic, while "and" shows the coordination of two meanings. The research results indicate that the abstracts of mathematical academic papers just use transitions like "and, but, however" more frequently, which are not various. In the abstracts of linguistic academic papers, in addition to "and, but", there are more transitions like "hence, therefore, furthermore, thus" and so on. This different use of transitions shows that linguistics focus on the different expression forms of topics while mathematics focus on the exact expressions of the content instead of the expression forms.

The endophoric markers are the least frequently used markers in both disciplines, since samples studied in this research are all abstracts which are the summary of a paper rather than the detailed explanation of research. The main body of an academic paper aims at interpreting the whole research background, theory, procedures and results. Therefore, endophoric markers may be used more in the main body. What is also shown in figure **??** is the great difference of frame markers and code glosses in the two disciplines. Frame markers are used for 35 times in abstracts of linguistics and 18 times in abstracts of mathematics. Code glosses are used for 29 times in abstracts of linguistics and only 14 times in abstracts of mathematics. For example: 3. The study intends to determine whether the reported gaps between the comprehension of active and passive and between short and full passive hold cross-linguistically. (Linguistics) 4. We argued, based on the present findings, that given the relevant linguistic input (e.g., flexibility in word order and experience with argument reduction),? (Linguistics) Some frame markers are used in the linguistic abstracts to show the research purposes. However, in mathematical abstracts, the research purposes are shown directly (such as "this study...", "this research studied...") and the frame markers are omitted. In addition, some frame markers are used in the linguistic abstracts like "(1), (2)..." or "first, second..." and so on to show the research procedures or content parts. Furthermore, code glosses are also used frequently in linguistic abstracts than mathematical abstracts. This can be analyzed from the perspective of the author's organization of discourse. In linguistic academic paper, there might be some different opinions to the same topic. Therefore, the author may use code glosses to explain his thoughts to make sure readers can understand him and the text content. Nevertheless, as a science discipline, mathematics focuses on the research findings and results which are in a high authenticity. Readers are easy to understand the author's opinion and purpose, so code glosses in abstracts of mathematical academic papers are used rarely.

3

7 b) The Distribution of Interactional Metadiscourse

Interactional metadiscourse shows the interaction between authors and readers. It is the engagement of authors and helps authors to establish the relationship with readers. Table 6 shows the distribution of interactional metadiscourse in abstracts of linguistic and mathematical metadiscourse. Table 6 indicates that the most frequently used sub-category of interactive metadiscourse in linguistics is hedges, with 49 times, which takes 33.01% of all interactive metadiscourse in linguistic abstracts. The sub-category which is used least frequently in linguistic abstracts is self mentions, with 17 times, which takes up 11.72% of all interactional metadiscourse in linguistic abstracts. In contrast, the most frequently used subcategory of interactional metadiscourse in mathematical metadiscourse is self mentions, which is used for 29 times, amounts to 30.53% of all interactional metadiscourse in linguistic abstracts. The least frequently used one is boosters, which is used for only 5 times.

Figure **??**: The interactional metadiscourse trends in the two disciplines Figure **??** shows the comparison of interactional metadiscourse use in the abstracts of linguistic and mathematical academic papers. Compared with the distribution of interactive metadiscourse, the trends of interactional metadiscourse in the two disciplines are somewhat different. It is shown that self mentions in abstracts of mathematical academic papers are used more frequently than being used in abstracts of linguistic academic papers. Except for self mentions and engagement markers, other subcategories of interactional metadiscourse are all used more often in linguistic abstracts among which the frequencies of hedges and boosters in the two disciplines show the most differences. However, the uses of engagement markers in the two disciplines are similar.

As a kind of arts discipline, hedges are used frequently in linguistic academic papers, for example: 5. The participants' collaborative or non-collaborative orientation to the activity, shaped by their goals and level of involvement in the task, seems to have a stronger effect on the nature of the interaction and the opportunities this offers for LREs and learning than the overall proficiency of the dyad. 6. The second and perhaps the more intriguing finding is the variation seen across the different languages in children's comprehension of full passive constructions. An Analysis of Metadiscourse in the Abstracts of English Academic Papers "Seems to" and "perhaps" are both hedges in example 5 and 6. There are many other hedges used in linguistic academic papers, such as "generally", "sometimes", "often" and so on. In linguistics, different scholars have different opinions towards the same topic.

Therefore, authors often use hedges to make sure that their researches are objective and reliable. However, hedges used in mathematical academic papers are not frequent and various. Mathematics is a kind of science discipline, which is very precise and the whole research process must be strict without any obscure point. Thus hedges are used less frequently in mathematics .

Except for hedges, the use of boosters and self mentions are also different in mathematics and linguistics. Boosters show the author's confidence towards his opinions or results. Hence the frequency of boosters in abstracts of mathematical papers is 5, which indicates that mathematical papers are precise in expression.

Different from other interactional metadiscourse markers, self mentions are used more in mathematics than in linguistics. Zhou (2014) believed that self mentions are one of the most significant metadiscourse markers in academic discourse. They are mainly used to explicit reference to authors and help authors to make relations with the readers. This study shows that a lot of self mentions like "we" or "our" are used in mathematics. Nevertheless, different from mathematics, "I" is the most frequently used self mention marker in linguistics. In mathematics, researches are usually carried out by several people, and the importance of authors is also emphasized in the research process. Thus in the abstracts of mathematical academic papers, self mentions are used for many times such as example 7.

8 7.

We analyze the effect of inertia on the flow of viscoplastic liquids through an axisymmetric expansion followed by a contraction.

The uses of engagement markers in the two disciplines are similar with 20 and 23 times respectively. This indicates that linguistics and mathematics both pay attention to build relationship with readers and involve readers in the research. Further, such kind of use can enhance readers' sense of participation and makes the content be more acceptable.

V.

9 Conclusions

As shown in this research, metadiscourse markers were used differently in the two disciplines. Thus in academic writing of abstracts, more interactive metadiscourse should be used in both arts and science disciplines. Meanwhile, authors in arts discipline are supposed to use more transitions while authors in science discipline should use fewer hedges to offer a credible representation of themselves. This research shows the features of the metadiscourse in abstracts of linguistic and mathematical academic papers. Therefore, further studies can be done to analyze the reasons of those features and more academic papers of different disciplines can be used as samples to analyze the metadiscourse features. [1]

1

Figure 1: Figure 1 :

Figure 2: An

1

the multifunction of metadiscourse. In Crismore et classification, textual metadiscourse was divided in textual markers and interpretive markers. Interper metadiscourse was divided into five sub-categories: hedges, certainly markers, attributors, attitude ma commentary.

In Hyland's   (20 metadiscourse was divided into interactive meta-discourse and interactional metadiscourse. Accor-d to Hyland's research (2004), interactive meta-disco was used to "refer to features which set out an arg to   explicitablish   the interpretations". Interactional metadiscourse was u to "involve readers in argument by alerting them t
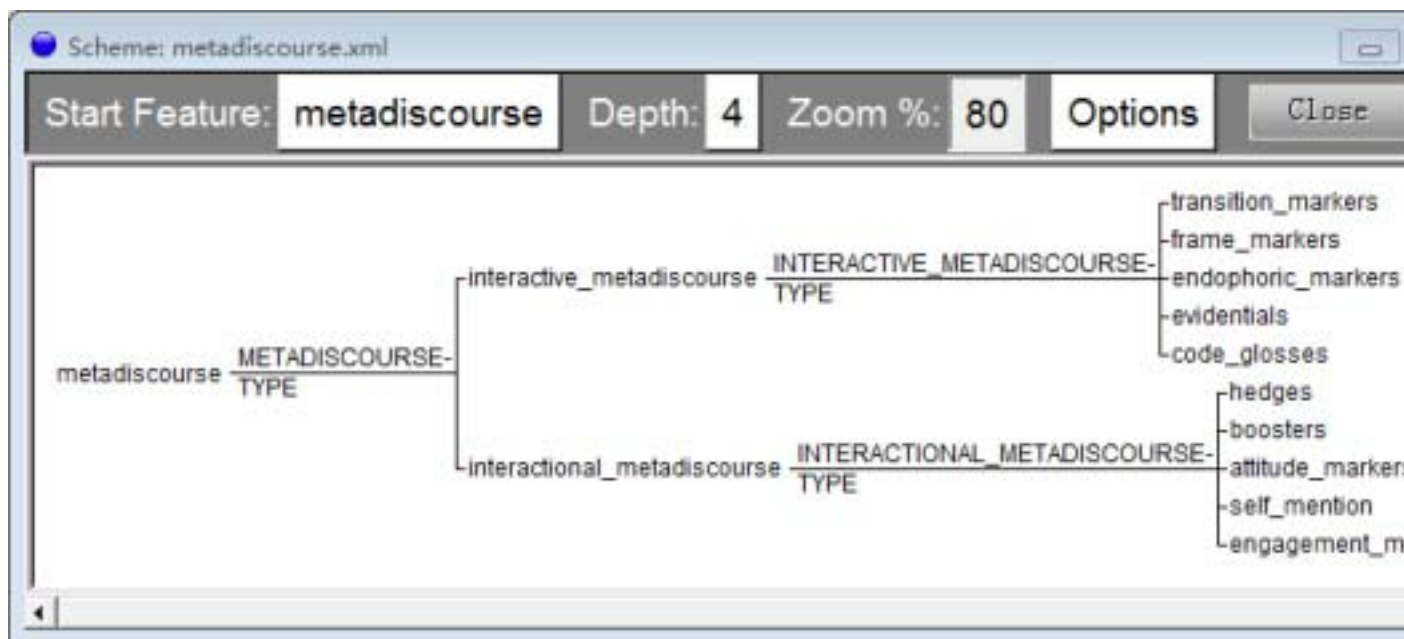
divided metadiscourse into two types: textual metadiscourse and interpersonal metadiscourse. The two types of metadiscourse consisted of seven kinds of metadiscourse markers: text connectives, code glosses, validity markers, narrators, illocution markers, attitude markers,   commen-taries.

Later, Crismore et al. (1993) separated and reorganized Vande Kopple's classification according to

author's perspective towards both propositional information and readers themselves".

Category	Function	Ex
Interactive	Help to guide the reader through the text	
Transitions	Express relations between main clauses	in addition; but; t
Frame markers	Refer to discourse acts. Sequences, or stages	finally; to conclud
Endophoric markers	Refer to information in other parts of the text	noted above; see F
Evidentials	Refer to information from other texts	according to X; Z
Code glosses	Elaborate propositional meanings	namely; e.g.; such
Interactional	Involve the reader in the text	words
Hedges	Withhold commitment and dialogue	open might; perhaps; p
Boosters	Emphasize certainty or close dialogue	in fact; definitely;
Attitude markers	Express writer's attitude to proposition	unfortunately; I a
Self mentions	Explicit reference to author (s)	I; we; my; me; our
Engagement markers	Explicitly build relationship with reader	consider; note; you

Figure 3: Table 1 :

3

	Tokens	Frequency	Metadiscourse Percentage (%)
Linguistics	5365	315	58.99
Mathematics	5725	219	41.01
Total	11090	533	100

Figure 4: Table 3 :

5

Interactive metadiscourse	Linguistics		Mathematics	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Transitions	79	46.47	75	60.48
Frame markers	35	20.59	18	14.52
Endophoric markers	10	5.88	6	4.84
Evedentials	17	10.00	11	8.87
Code glosses	29	17.06	14	11.29
Total	170	100	124	100

Figure 5: Table 5 :

6

Interactional metadiscourse	Linguistics		Mathematics	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Hedges	48	33.10	12	12.63
Boosters	21	14.48	5	5.26
Attitude markers	39	26.90	26	27.37
Self mentions	17	11.72	29	30.53
Engagement markers	20	13.79	23	24.21
Total	145	100	95	

Figure 6: Table 6 :

9 CONCLUSIONS

217 [Written Communication ()] , *Written Communication* 1993. 10 (1) p. .

218 [Journal of English for Academic purposes ()] , *Journal of English for Academic purposes* 2010. 9 (2) p. .

219 [Huang Qin and Yao] 'A Comparative Analysis of the Use of Metadiscourse in English and Chinese News
220   Commentaries'. Xiong Huang Qin , Yao . *J]. Foreign Language Research* 2012 (1) p. .

221 [Zhang Man] *A Comparative Study of First Person Pronouns in Abstracts in China and English*, Zhang Man .

222 [Dongmei and Ruiying ()] 'A Genre Analysis of Research Article Abstracts'. Ge Dongmei , Yang Ruiying . *Modern*
223   *Foreign Languages*, 2005. p. .

224 [Zhonghua and Yan] 'A Multidimensional Contrastive Move Analysis of English Abstracts by English and
225   Chinese Writers'. Xiao Zhonghua , Cao Yan . *J]. Foreign Language Teaching and Research* 2014 (3) p.
226   .

227 [Qiang and Xiaoguang] 'A Review of the Theoretical Perspectives of Metadiscourse Research'. Wang Qiang ,
228   Cheng Xiaoguang . *Foreign Languages and Their Teaching*, 2016 p. .

229 [Hongwei] 'A Three-dimentional Study on English Teachers' Metadiscourse in Chinese University Classroom
230   Discourse'. Guo Hongwei . *Chinese Foreign Languages*, 2014 p. .

231 [Mingming and Minqiang] 'Comparatively Studying on the Meta-discourse of English Abstracts in Academic'.
232   Sun Mingming , Tong Minqiang . *Journal [J]. Academic Exchange* 2015 (3) p. .

233 [Hyland ()] *Disciplinary discourse: Social interactions in academic writing*, K Hyland . 2000. London: Longman.

234 [Hyland ()] 'Disciplinary interactions: metadiscourse in L2 postgraduate writing'. K Hyland . *Journal of Second*
235   *Language Writing* 2004. 13 p. .

236 [Zhiying and Guowen ()] 'Evaluation-assigning Functions of Metadiscourse'. Xin Zhiying , Huang Guowen .
237   *Foreign Language Education* 2010. (11) p. .

238 [Hyland and Metadiscourse ()] K Hyland , Metadiscourse . *Foreign Language Teaching and Research Press*,
239   (Beijing) 2008.

240 [Gillaerts and Van De Velde] *Interactional metadiscourse in research article abstracts*, R Gillaerts , F Van De
241   Velde .

242 [Zhiying ()] 'Intersubjectivity-constructing Resources in Academic Texts: Identification, Assessment and Appli-
243   cation'. Xin Zhiying . *Journal of University of Science and Technology Beijing (Social Science Edition)* 2011.
244   (6) p. .

245 [Xinzhang ()] *Metadiscourse and Functional Linguistics [J]. Foreign Languages and Their Teaching*, Yang
246   Xinzhang . 2007. p. .

247 [Crismore et al.] *Metadiscourse in persuasive writing a study of texts written by American and Finnish university*
248   *students*, A Crismore , R Markkane , M S Steffensen .

249 [Ying] 'On Interactional Metadiscourse in Political Texts'. Lu Ying . *J]. Foreign Language Research* 2012 (5) p. .

250 [Runqing ()] Liu Runqing . *Foreign Language Teaching and Research Press*, (Beijing) 2013.

251 [Kopple ()] *Some exploratory discourse on metadiscourse*, Vande Kopple . 1985. 36 p. . (College Composition
252   and Communication)

253 [Williams and Style ()] J Williams , Style . *Ten Lessons in Clarity and Grace*, (Boston; Scott, Foresman) 1981.