

A Comparative Study on Epistemic Modality in Linguistic Research Article Conclusions

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Abstract—Epistemic modality is an important and complex linguistic device in academic writing, which could help authors state their claims and positions. The conclusion is also a critical part in research articles, where authors summarize their studies and give suggestions. Many scholars study modality in many aspects, but they rarely focus on its application in research article conclusions. Therefore, this study compared the use of modality in 25 conclusions of linguistic research papers written by native English speakers and 25 English conclusions written by Chinese authors from a systemic functional perspective. It focused on the similarities and differences of the use of modality in linguistic research article conclusions from two perspectives: value and orientation. The results show that both native English speakers and Chinese authors are more likely to rely on low and median value and subjective orientation in their conclusions. The findings suggest that linguistic research article authors tend to make claims in a reserved and tentative way. Moreover, this study shows that Chinese authors are more likely to employ modal expressions and subjective orientation of modality in their conclusions, which may relate to cultural diversity and modality shift. The findings of the study may help non-native English authors to produce linguistic research articles in a more acceptable way.

Index Terms—modality, research article conclusion, value, orientation

I. INTRODUCTION

In the past decades, English has always been the “official” language of research articles. According to academia, the most authoritative international academic journals are also written in English. Henceforth, in nations where English is not the native language, there is a trend of delivering degree programs in English, with English language majors and doctoral candidates mandated to compose their dissertations in English. With the increasing number of international academic publications edited in English, most academic communications have increasingly been dominated by English. Research articles are very important to start, advance or maintain a scholar’s study and career. However, writing an English research article is a more challenging thing for non-native English scholars than for native English speakers (Ahmad, 1997; Lillis & Curry, 2011). Nevertheless, scholars who are non-native English speakers are compelled to engage in academic competition by publishing in their respective fields in a language that is not their first, and in doing so, strive to attain recognition in the academic community (Hyland, 2016).

Epistemic modality has long been regarded as being critical to academic writing, and modality is used to hedge or boost propositions (Hyland, 1994). There are various ways to define modality. According to Lyons (1977), epistemic modality is concerned with “matters of knowledge, belief, or opinion rather than fact”. According to Coates (1983), the domain of epistemic modality ought to center on the speaker’s suppositions or evaluations of potentialities, which, in the majority of instances, conveys the speaker’s level of assurance (or lack of confidence) in the veracity of the proposition being articulated. Palmer (2001) introduces epistemic modality as speakers express their judgments about the factual status of the proposition. From the perspective of systemic functional grammar, Halliday (2004) defined epistemic modality as the speaker is expressing his judgement or making a prediction. In systemic functional grammar, modal expression has two variables, “value” and “orientation”. “Value” refers to the writer’s commitment to the modalized statement, means different degrees of certainty at three levels, and it implies an obvious differentiation between certainty and uncertainty. The orientation of epistemic modality shows the author’s responsibility for the modal meaning conveyed through diverse linguistic forms, while also communicating the subjective or objective nature of a modal expression. For example,

Eg 1: She **must** have told you the truth. (high value)

Eg 2: Tom **should** go to school now. (median value)

Eg 3: She **may** be sad. (low value)

Eg 4: **I’m sure** we can success. (subjectivity)

Eg 5: **It’s possible** that he has already told her. (objectivity)

A conclusion is a crucial component of any type of writing. The academic writing’s conclusion is distinct from the result or discussion. Facts are descriptive, but points are interpretative, therefore if the result part deals with facts, the conclusion part deals with points. Authors of conclusion have some flexibility in deciding which of their possible points to include and then which to highlight. In short, authors claim that their contributions have proved and/or provide a new perspective. It reveals the author’s perspective on the research and what they anticipate from the entire article. However,

how to write qualified conclusions is a challenge to non-native English authors. As epistemic modality is an effective tool to express an author's attitude, non-native English speakers need to use modality properly in the conclusion to improve the quality of their work. Though the function of epistemic modality in the conclusion is of great value, less attention has been given to the comparison of epistemic modality between conclusion of linguistic articles by English authors and those by Chinese authors. The use of epistemic modality is different in Chinese and English (Xie, 2022), which may influence Chinese authors expressing their attitudes and stating their claims. This study, therefore, aims to compare the differences between the use of epistemic modality in the conclusion section of English research articles written by English authors and Chinese authors. To achieve the research goal, the following questions are addressed:

(1) What are the similarities and differences of the use of epistemic modality between native English speakers and Chinese authors?

(2) What are the reasons for the different use of epistemic modality between native English speakers and Chinese authors?

On the basis of the findings of the study, hoping non-native English authors will have a better awareness of the choice of epistemic modality in the conclusion. With this awareness, non-native English authors may be able to more strategically qualify their claims to their propositions.

II. LITERATURE REVIEW

A. *Epistemic Modality in Systemic-Functional Grammar*

The interpersonal metafunction in systemic-functional grammar encompasses all modes of linguistic expression employed to convey social and personal relationships, ranging from the speaker's manner of entering a speech situation to their performance of a speech act. This function is realized by the implementation of mood and modality. Modality is an essential part that realizes the function of the interpersonal metafunction. Therefore, effective communication between the speaker/writer and the listener/reader is contingent upon the judicious employment of modality. Within systemic-functional grammar, the system of epistemic modality types is comprised of the scales of probability, which gauges the likelihood of the proposition's veracity, and usuality, which ascertains the frequency of the proposition's truthfulness, in addition to the scales of inclination and obligation. Halliday (2004) has referred to probability as "epistemic modality".

According to Halliday (2004), there are two parameters of each epistemic modal expression: value and orientation. Value refers to the speaker's modal commitment and the degree of certainty, while orientation indicates the linguistic forms of expressing modality and the speaker's modal responsibility (Thompson, 2013). In epistemic modality, the concept of value, or the degrees of certainty, may be classified into three distinct levels: low, median, and high, which correspond to the modal expressions of possibly, probably, and certainly, respectively. Furthermore, modal expressions may be categorized according to their orientation, either subjective (e.g., 'I think that...') or objective (e.g., 'it is likely that...'), and explicit (e.g., 'I believe that...', 'it is possible that...') or implicit (e.g., 'possibly', 'may'). The orientation of modal expressions serves to demonstrate the source of modality, either directly from the speaker or indirectly conveyed through the speaker by another party, as well as how the speaker assumes responsibility for the expressed judgment via various linguistic forms (Thompson, 2013). The orientation is objective when the speaker is trying to state things which are objective and s/he just tells the fact to the hearer, whereas the orientation of epistemic modality is subjective when the speaker is indicating that s/he is the source of modality instead of telling the facts.

B. *Studies on Modality in L1 and L2 Academic Writing*

Recent researches have shown that L2 speakers use epistemic modality differently than L1 speakers. In academic writing, L2 speakers tend to use less epistemic modality compared to L1 speakers (e.g., Chen, 2010). This is often attributed to L2 speakers' limited knowledge of academic vocabulary and discourse conventions. L2 speakers also tend to use more tentative language when expressing uncertainty in academic writing (e.g., Hu & Li, 2015). Comparative studies were widely adopted for the usage of epistemic modality in L1 and L2 academic writing. Scholars conducted their investigations from the perspective of the different use of epistemic modality in various languages. Hinkel (2009) discussed the effects of essay topics on modal verb uses in L1 and L2 academic writing. He introduced the indirectness in L1 and L2 academic writing which includes the study of epistemic modality. Yang et al. (2015) conducted an examination of the utilization of epistemic modality in a corpus of 25 English-medium medical research articles from a systemic functional perspective. The results indicated that medical research article writers were more likely to use low and median values, implicitly subjective, implicitly objective and explicitly objective orientations of epistemic modality. These studies indicated there are differences between L1 and L2 writers' usage of epistemic modality. However, few studies have focused on the similarities and differences of the use of epistemic modality between L1 and L2 writers, taking into account the conclusion as an important part of the academic writing.

C. *Studies on Conclusion*

As the conclusion section has always been the critical section in a complete article, scholars research the conclusion in various ways. Some scholars compare expressions of an evaluative stance in English and non-English research article conclusions (Loi et al., 2016). The structure of conclusion is a popular topic to discuss. Bunton (2005) explains the

general structure of PhD conclusion chapters and analyzes for their functional moves and steps. Likewise, Sheldon (2019) studies knowledge construction of conclusion sections of research articles written by English L1 and L2 writers to help them find a better way to organize their conclusions. Moreover, some scholars pay more attention to the genre of conclusions. Although there are bodies of research studies on modality and conclusions respectively, the studies on their correlation are few. The reason for this may lie in scholars' insufficient awareness of the importance of modality in conclusions. Therefore, in this study, we will focus on modality in linguistic research article conclusion by applying quantitative research to give an appropriate suggestion of the use of modality in conclusion to non-native English authors.

III. METHODOLOGY

A. Research Data

The selection of research materials from a solitary academic discipline was predicated on the likelihood that any subtle variations could have arisen due to disciplinary disparities in the texts. Specifically, the research articles scrutinized for this study were obtained from the discipline of linguistics. This choice of discipline was made as the writer possessed a considerable degree of familiarity with the field, thus facilitating the reading and interpretation of its research articles, and thus minimizing the possibility of bias in the analysis.

50 research article conclusions in English, with 25 for each group, g1 being English native speaker authors and g2 being Chinese authors, were chosen from *Journal of Pragmatics* and *Lingua*, which are the most authoritative international linguistic journals. All 50 articles were published from 2012 to 2022, with a length of conclusion ranging from 200 to 700 words.

Among the 50 linguistic research articles, 25 English research articles were written by first-language English speakers and 25 English research articles by Chinese native speakers. Native English speaker authors were distinguished from non-English speaker authors based on Wood's (2001) standard: "first authors must have names native to the country concerned and also be affiliated with an institution in countries where English is spoken as the first language." Similar to the selection of research articles written by English native authors, Chinese authors were also chosen based on the institutions they attach to.

The conclusion section was defined as the last section of a research article which was found after the 'discussion' section or 'results and discussion' selection. The unit of this analysis for the investigation was the CLAUSE. According to Halliday (2004), clause was defined as "the central processing unit in the lexicogrammar — in the specific sense that it is in the clause that meanings of different kinds are mapped into an integrated grammatical structure". In general grammar, a clause is a group of words that includes a subject and a verb, and form a sentence or part of a sentence. A complex clause is a unit consisting of two or more clauses linked by coordination or subordination. There are examples from our research materials.

Eg 6: ||Our analysis **suggests** that standardized, scripted approaches to communication **are likely to** be limited in their effectiveness||if they...

Eg 7: ||I also **believe**||that they **confirm**||what I had set out as my own general impression of my own sense of humor.

Therefore, the selected field, the arrangement of time, authors, the identification of conclusions and the unit of analysis have been determined. Then, research procedures were explained in the next part specifically.

B. Research Procedures

The modality that applied in native English speakers' conclusions and non-native English speakers' conclusions was compared based on two parameters: value and orientation, which were developed by Halliday (2004) and Thompson (2013). Therefore, it is important to make clear classifications of value and orientation. There are three values in epistemic modality: high, median, and low. Table 1 shows the values of modality in systemic functional grammar with examples from corpus. The author of this thesis divided each parameter into different types of linguistic realization based on modal expressions in the corpus to make it easier to recognize and collect.

TABLE 1
VALUES OF MODALITY IN SYSTEMIC FUNCTIONAL GRAMMAR

Value	Linguistic realization	Examples
High	An epistemic verb with a subject in a clause	We believe that...; our findings show...; we conclude...
	Modal auxiliary	Must; have to; could not...
	Adverb	Undoubtedly; unquestionably; unlikely...
	Adjective	Undisputed; unquestionable...
Median	An epistemic verb with a subject in a clause	We hypothesized...; it suggests...
	Modal auxiliary	Should...
	Adverb	Probably; likely...
	Adjective	Probable; possible...
Low	An epistemic verb with a subject in a clause	Our findings imply...
	Modal auxiliary	May; could; might...
	Adverb	Potentially...
	Adjective	Potential...

Then, as explained before, orientation is divided into subjectivity and objectivity. Examples of modal expressions in the corpus of different orientations have been presented in Table 2. Table 2 presents some modal expressions of subjectivity and objectivity of orientation.

After having a basic concept of these expressions, 50 research articles were divided into two groups, 25 research articles written by native English speakers were group 1, and the other 25 research articles written by Chinese authors were group 2. The author calculated all the modal expressions in conclusion sections of each group and classified them based on orientation and value. Data have been showed in Table 3. Then, the frequency of each type of modal expressions could be compared.

The results of the analysis were subject to a quantitative analysis. The occurrence frequencies of modal expressions in conclusion in the research articles under study were manually counted. In order to answer the questions mentioned in the introduction section, what kinds of modal expressions were most frequently used in conclusions written by native English-speaking authors and Chinese authors was discussed. Besides, reasons for using these modal expressions were explored based on value and orientation.

TABLE 2
ORIENTATIONS OF MODALITY IN SYSTEMIC FUNCTIONAL GRAMMAR

Orientation	Linguistic realization	Examples
Subjective	An epistemic verb with a first person subject in a separate	We believe that...; we conclude...; we speculate...; we hypothesize...
	Modal auxiliary	May; might...
Objective	Adverb	Perhaps; unlikely
	Adjective	Likely; unlikely; possible
	Modal lexical verb with an inanimate subject referring to the data, results, findings, etc	Our findings imply...; our findings suggest...; our result suggests...; our discussion implies...

IV. RESULTS

A. The Frequency of Value in Conclusion

According to the analysis of the 50 linguistic research articles, most of the modal expressions got the chance to occur in conclusions, though the frequencies of each expression were not in equal proportion.

In 25 research article conclusions written by English native speakers (g1), the least frequently used was high value, with a total number of 7 (8.43%) only. The most frequently used in conclusion was low value, with a total frequency of 47 (56.62%). Median value lay in between with the frequency of 29 (34.93%). Similarly, in the 25 research articles written by Chinese native authors (g2), high value was the least frequently used in conclusions, with a total frequency of 4 (4.16%). While the most frequently used in conclusions was low value, with the total frequency of 58 (60.41%). Median value still lay in between with the number of 34 (35.41%). Examples 8-13 are instances that show different values in Group 1 and Group 2 (g1-19 in Example 8 refers to the 19th sample in Group 1, and so on).

TABLE 3
THE FREQUENCY OF VALUE IN CONCLUSION

	Low	Median	High	Total
English (g1)	47 (56.62%)	29 (34.93%)	7 (8.43%)	83 (100%)
Chinese (g2)	58 (60.41%)	34 (35.41%)	4 (4.16%)	96 (100%)

Eg 8: It **must** have undergone shaping by UG theorists only after studying all relevant linguistic data from all possible human languages. (g1-19) (high value)

Eg 9: Nonetheless, **we believe that** the naturalistic quantitative merits of this study far outweigh its methodological limitations,... (g2-16) (high value)

Eg 10: Elicitation data, in which nouns are provided in a relatively context-free environment, **shows** that the notion of default class membership for nouns is fairly robust. (g1-4) (median value)

Eg 11: The results of the study have also **shown that** whether and how readers' online interpretation of referring expressions will be affected by over-specifications is closely related to three factors,... (g2-6) (median value)

Eg 12: **I hypothesize that** the kinds of immediate judgments noted by Ambady and Wilson are linked with the sorts of emotional processes detailed by Damasio, et al. (g1-2) (low value)

Eg 13: Until this question is answered, interpreting directionality will remain a **potential** factor that **might** pose a challenge to our arguments. (g2-16) (low value)

B. The Frequency of Orientation in Conclusion

As shown in Table 4, the use of subjective was more frequent than objective in both Group 1 and Group 2. Obviously, research articles written by Chinese authors applied much more subjective modality (81.25%) than objective, while the proportion of subjective (60.24%) and objective (40.96%) in research articles written by English native speakers were relatively close. Examples 14-17 indicate different orientations in Group 1 and Group 2.

TABLE 4
THE FREQUENCY OF ORIENTATION IN CONCLUSION

	Objective	Subjective	Total
English (g1)	34 (40.96%)	50 (60.24%)	83 (100%)
Chinese (g2)	18 (18.75%)	78 (81.25%)	96 (100%)

Eg 14: **We suggest that** in the future it **might** be useful to consider the possibility that both degree of prominence and communicative significance are continuous variables. (g1-15) (subjective)

Eg 15: In summary, **I suggest that** the study of semantics **should** take context into account, as this is consistent with the fact that the same sentence can have multiple interpretations in different contexts. (g2-22) (subjective)

Eg 16: Once the set of **potential** referents has been narrowed to those belonging to that category, the hearer will follow the relevance theoretic comprehension procedure and test interpretations in order of accessibility. (g1-23) (objective)

Eg 17: **It is thus shown that** syntactic and pragmatic processes interact to determine the different readings of the copular constructions. (g2-11) (objective)

C. The Frequency of Different Modal Expressions

Table 5 shows the proportion that each modal expression takes respectively. The table presents that Chinese authors focus a lot on the employment of modal auxiliary, with a frequency of 75%, while native English speakers using modal expressions in research article conclusion are more decentralized in various modal expressions, with modal auxiliary accounting for 53.01%. More specific examples of different modal expressions are as follows.

Eg 18: **I have, however, suggested that** extending an account of right node raising to self-repairs may shed some light on the phenomenon,... (g1-25) (an epistemic verb with a first person subject in a separate)

Eg 19: Such highly variable input data **might** reasonably be thought to make resulting representations about morphemes weaker than if the input data were highly consistent and regularly activating the posited morphemic representation. (g1-21) (modal auxiliary)

Eg 20: The information this study has provided for teachers and researchers is that ER and EV are very valuable for the literacy needed in English class, that EV is **potentially** as good as ER in providing vocabulary input,... (g1-13) (modal adverb)

Eg 21: Once the set of **potential** referents has been narrowed to those belonging to that category, the hearer will follow the relevance theoretic comprehension procedure and test interpretations in order of accessibility. (g1-23) (adjective)

Eg 22: On a final note, **this study shows that** “I thought”-turns are highly inflected by social relationships as a long-term feature of social life. (g1-5) (modal lexical verb with an inanimate subject)

Eg 23: **I conclude that** the first-person pronoun + topic marker combination is gradually developing into a construct that is used as the topic of a matrix clause and as a pragmatic marker. (g2-5) (an epistemic verb with a first person subject in a separate)

Eg 24: This **may** constrain the generalizability of our empirical findings. (g2-8) (modal auxiliary)

Eg 25: However, we clearly know that the sample used for the paper is not at all adequate as a typological sample, but it **probably** is appropriate for the purpose of this study... (g2-17) (modal adverb)

Eg 26: However, it should be noted that, as a naturalistic corpus-based approach, this study could not fully exclude all **potential** confounding factors, as would be **possible** in a highly-controlled experimental setting. (g2-16) (adjective)

Eg 27: **The results of the study have also shown that** whether and how readers' online interpretation of referring expressions will be affected by over-specifications is closely related to three factors... (g2-6) (modal lexical verb with an inanimate subject)

TABLE 5
THE FREQUENCY OF DIFFERENT MODAL EXPRESSIONS

Modal Expressions	English (g1)	Chinese (g2)
An epistemic verb with a first person subject in a separate	7 (0.08%)	6 (0.06%)
Modal auxiliary	44 (53.01%)	72 (75%)
Modal adverb	10 (12.04%)	2 (0.02%)
Adjective	9 (10.84%)	7 (0.07%)
Modal lexical verb with an inanimate subject referring to the data, results, findings, etc	14 (16.86%)	9 (9.38%)
Total	83 (100%)	96 (100%)

V. DISCUSSION

A. The Comparison of Modality

The results present that almost every conclusion that had been researched involved modal expressions in linguistic research articles written by both native English speakers and Chinese authors. This finding can show that academic authors rely so much on modality in their conclusion sections. It may be due to the pragmatic function of modality, which mainly expresses politeness.

Politeness is widely regarded as an important factor in effective scientific or academic writing and used to develop the interaction between the author and reader (Hyland, 1994). Without polite expressions, a good interaction between the author and the reader cannot be established, which may prevent the author from making the reader accept his or her claims. The following examples with low value from our samples also show authors' reserve and respect for the reader in making their claims.

Eg 28: The data explored here also pose a challenge for the notion of semantic composition for these languages, since it is **possible**,... (g1-4) (low value)

Eg 29: 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. (g2-8) (low value)

Eg 30: Although some groups of data appear to be subject to the conserving effect of frequency, showing very low reduction rates, for most of the data, the more often that para occurs with a word, the more **likely** that para is to be reduced. (g1-16) (median value)

Eg 31: However, we clearly know that the sample used for the paper is not at all adequate as a typological sample, but it **probably** is appropriate for the purpose of this study,... (g2-17) (median value)

In linguistic discourse, the utilization of low and median value modality in the conclusion section denotes an expression of the author's viewpoint in a reserved manner, thereby suggesting that the author's claims are not definitively established as truth. This form of discourse invites doubt and allows for alternative perspectives to be considered, indicating the author's intention to treat the reader as an intellectual equal who is capable of independent thought. Hyland (2006) suggests that this approach reflects the author's desire to avoid imposing their views on the reader, opting instead for a negative politeness strategy through the application of low and median value modalities in the presentation of novel claims. The prevalence of low and median value modalities in the conclusion sections of linguistic research articles implies that authors in this field exhibit a tendency to adopt these strategies in their writing.

Myers (1989) suggests that the readers of research articles are either "an immediate audience of individual researchers and particular groups of researchers doing similar work" or "the wider scientific community". Obviously, the intended audience for linguistic research articles comprises of proficient linguistic scholars, as opposed to laypersons, who possess sufficient expertise and professional acumen to develop their independent perspectives. For these learned readers, any form of imposition may encroach upon their negative face, as it infringes upon their autonomy to form ideas and opinions. Therefore, when linguistic authors prepare for their research articles, they usually use particular linguistic devices to show their respect for the negative face of their readers and mitigate the force of their academic knowledge claims.

Besides, the results of this study indicate that Chinese authors tend to employ more modality than native English speaker authors. Cultural diversity between China and English-speaking countries may be the main reason for different frequency of modality in conclusion. Because of the difference of Chinese and western cultural tradition, the concepts of politeness and face in writer-reader interaction also have different cognition, one of the important differences is that the concept of "face" is strongly influenced by Confucianism and collectivism characteristics, while in western society, here mainly refers to the European and American developed country English society, have been strongly influenced by individualism. Saving face is Chinese first characteristic of social context. Using modality to state one's claims is a good way to cater to readers' positive face. Therefore, Chinese authors tend to employ a lot of hedges in their research article conclusion sections even in statements which are not used to state their claims. For example,

Eg 32: As the notion of (in)appropriateness is context-dependent and socio-culturally motivated, future research **may** compare RHD topical divergences with topic use practices of neurologically intact participants in other languages,... (g2-17)

Eg 33: However, it **should** be noted that, as a naturalistic corpus-based approach, this study **could** not fully exclude all potential confounding factors,... (g2-16)

Examples 32-33 from our samples show that Chinese authors sometimes use modality in sentences which are not concluding sentences. Comparing with research article conclusions written by native English speaker, Chinese authors applied more modality in non-concluding sentences. This finding may be influenced by different cultures and language preference.

B. The Comparison of Value

The finding results clearly show that high value is not used frequently in conclusion sections of research articles written by either native English speakers or Chinese authors, constituting less than 10 percent of the total number of modal expressions. This low percentage suggests that linguistic authors are often too cautious to use high value modal expressions to express positive politeness, which can be risky (Myers, 1989). In linguistic research articles, although authors could use high value modal expressions to express solidarity with readers and assume that readers have the same opinion about a proposition, the readers may not necessarily agree with the authors. If the authors' points of view are not shared by the readers, the authors' politeness strategy is likely to fail, and the interaction between the authors and the readers will not succeed. Therefore, authors will fail to get acceptance for their claims from the readers.

As shown in Table 3, low value and median value predominate in both research article conclusion written by native English speakers and Chinese authors. The number of employment of low value and median value may indicate that linguistic research article authors tend to express uncertainty rather than certainty about their claims in conclusion. This

study also conforms to Hyland's (1996) studies in hedge and modality, which report that low value and median value modality are most frequently used modal expressions. There are some examples from our samples. Examples 34-39 are statements with low value modality.

Eg 34: Teachers **might** reasonably ask how this one recording of a teacher intervening in a dispute between three children can apply to a range of interventions in a range of settings. (g1-8)

Eg 35: Therefore, although the cognitive mechanisms triggering the behavioral variations associated with linguistic choice **may** be the same for all humans. (g1-2)

Eg 36: **It is possible that** notions such as coercion, construal, or other related concepts would provide useful ways of talking about these mismatches and their resolution. (g1-4)

Eg 37: The mismatch between patterns of perceptual similarity and patterns of unfaithful mapping is inconsistent with a **potential** extension of the P-map hypothesis to the production of phonotactically unattested sequences. (g1-18)

Eg 38: It is therefore especially important for Chinese scientists to develop an awareness of the variety of hedging devices that **could** be employed in showing detachment or commitment in their writing. (g2-4)

Eg 39: Another **possible** motivation is the interaction between person deixis and spatial deixis in a language which lacks person marking on the verb. (g2-7)

Examples 40-42 are statements with median value.

Eg 40: Generalizable pragmatic rules may be discovered ethnographically, or through psychological investigation, but they will **likely** never account perfectly for every case. (g1-2)

Eg 41: ...but it **probably** is appropriate for the purpose of this study, which demonstrates a method, rather than drawing conclusions about frequencies, distributions, etc. (g2-17)

Eg 42: **Our findings indicate that** the divergent rhetorical construction by means of metadiscourse across Chinese and English RAs may arise from some linguistic, sociocultural and rhetorical factors. (g2-2)

To some extent, despite the variety of linguistic forms and values, the modal expressions used in the above examples all convey writer's intention to add uncertainty in their statement. It is appropriate for both native English speaker authors and Chinese authors to propose their claims and statement by the means of modal expressions. Based on their studies and investigations, linguistic authors often give their considerations to the amount of certainty they should put in a particular statement. Low value and median value help authors express their proposition more cautious and tentative but not too categorical. Therefore, low value and median value are more frequently used in conclusions written by both native English speakers and Chinese authors because of the provisional nature of the conclusions being discussed.

Linguistic research article authors' preference for low and median value modal expressions may be associated with the nature of language. Language itself is an uncertain and complex science, which means it is often influenced by other factors and it is not always expressed by a certain form. Thus, the data of their study are often not as reliable and precise as those science academic articles. An absolute or definite conclusion is often not available. It might be due to imprecision, indicativeness and the lack of systematic empirical validation that the authors of linguistic research articles prefer to express more uncertainty than certainty in conclusion.

The inclination of authors of linguistic research articles to utilize expressions of uncertainty may be attributed to their endeavors to persuade their readership of the validity of their assertions, thereby enhancing the likelihood of their claims attaining the status of established knowledge. This is achievable by employing modalities of low and median values, which demonstrate a relatively high degree of likelihood regarding the certainty or veracity of the authors' propositions, reflecting their academic rigor and discernment in formulating conclusions. By employing low and median value modalities in their conclusions, authors can mitigate the risk of encountering opposition from their readers (Martín-Martín, 2008), and engender greater acceptance of their claims among the readership. Therefore, the appropriate utilization of low and median value modalities has the potential to facilitate the acceptance of the assertions posited by authors of linguistic research articles.

C. The Comparison of Orientation

In both articles written by native English speakers and Chinese authors, subjective marks the prominence of subjectivity in conclusion by explicitly stating the subjective source of conviction, that is, the authors or the readers. In the corpus, the subjective orientation is used more frequently than objective orientation, especially in Group 2 (Chinese). The following are examples of modality with subjective orientation from the samples.

Eg 43: **I hypothesize that** the kinds of immediate judgments noted by Ambady and Wilson are linked with the sorts of emotional processes detailed by Damasio et al. (g1-2) (subjective)

Eg 44: **I conclude that** the first-person pronoun+topic marker combination is gradually developing into a construct that is used as the topic of a matrix clause and as a pragmatic marker. (g2-5) (subjective)

Appropriately expressing subjectivity in conclusion of academic research articles may contribute to the acceptance of the authors' claims by the readers and the establishment of a good writer-reader relationship. Because of the author's subjective statement, the claim is marked only as a possible opinion to be verified, not as a definitive or absolute statement of fact (Hyland, 2006). Modality with a subjective orientation conveys the idea that what the authors present is only their personal/subjective point of view, and that the reader's point of view is obvious. The interaction between the author and the reader develops well when the reader has room for dissent.

The subjective orientation used in the linguistic research articles written by both native English speakers and Chinese

authors in the study is predominantly realized by the use of modal auxiliary. As shown in example 45-49, this pattern eliminates personal involvement by hiding first-person pronouns in the expression, thus indicating that the author is trying to express non-personality in their statement, which is considered an essential characteristic of scientific academic writing (Lassen, 2006). The lower the researchers' participation in a scientific study, the more credible it is and the more persuasive its conclusions.

Eg 45: We suggest that in the future it **might** be useful to consider the possibility that both degree of prominence and communicative significance are continuous variables. (g1-15)

Eg 46: Since judgment tasks have a metalinguistic component, and force a binary choice, a key skill that develops with age **ought to** be the metalinguistic awareness that even slight violations of meaning (pragmatics) **ought to** be rejected or objected to in a similar fashion as violations of truth (semantics) and well-formedness (syntax). (g1-22)

Eg 47: I have, however, suggested that extending an account of right node raising to self-repairs **may** shed some light on the phenomenon, and perhaps support an approach that at first glance **might** seem to be a radical departure from more traditional approaches. (g1-25)

Eg 48: 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. (g2-8)

Eg 49: However, it **should** be noted that, as a naturalistic corpus-based approach, this study **could** not fully exclude all potential confounding factors, as would be possible in a highly-controlled experimental setting. (g1-16)

On the other hand, the study shows that Chinese author tend to apply more subjective orientation of modality in their conclusions. As shown in Table 4, research article conclusion sections written by Chinese authors employ more subjective modal expression (81.25%) than native English speaker (60.24%). As shown in Table 5, most of subjective modal expression in research article conclusion written by Chinese authors focus on the use of modal auxiliary. The frequency of "should" in conclusion written by Chinese authors is apparently much higher than native English speakers' in the study. There are some examples in group 2.

Eg 50: Therefore, the results cannot be extrapolated to the whole academic culture or to other disciplinary fields and **should** be taken cautiously. (g2-2)

Eg 51: Without question, to gain further insight into the mutating extension, the statistical sense threshold of the marginal instances' dissimilarity from the exemplars in terms of the semantic dilution level **should** be identified. (g2-12)

Statements like "...should..." have a predominant proportion in research article conclusions written by Chinese authors. One reason for they frequently apply "should" is the result of the method of "modality shift" adopted by Chinese authors when translating Chinese into English. In other words, Chinese authors tend to translate their claims and suggestions directly into English by Chinese language habits. Another reason why Chinese authors prefer to employ "should" in linguistic research article conclusion is that Chinese authors often pay more attention to different use between two languages in their studies, and give suggestions to the readers based on their findings. Therefore, their conclusions always involve suggestions for language learners and some suggestions for further research. "Should", as a result is the modal auxiliary which can express suggestion and instruction.

VI. CONCLUSION

Modality is a very important yet complex linguistic device in research article writing which is challenging for non-English speakers to implement and understand appropriately. In order to have a better understanding of modality in research article writing, especially in conclusion, 50 (25 for each group) linguistic research articles had been investigated from a systemic functional perspective. Instructed by the key research questions, which were raised on the basis of the research aim, this study took the conclusions of linguistic research articles as the research materials, and aimed to give a suggestion to non-native English linguistic authors to produce more acceptable linguistic research articles. This investigation into the comparison of value and orientation of modality reveals that these authors tend to apply low and median value of modality (altogether more than 90% of all examples in each group) and they are more likely to apply subjective orientation (altogether more than 50% of all examples in each group) in their conclusions. These findings suggest that linguistic research article authors will persuade readers and construct new knowledge mostly through a reserved and tentative presentation of their claims and avoid absolutizing their claims simultaneously. The differences of the use of modality between Chinese authors and native English speakers can be considered as cultural diversity and language habits, which may provide us a suggestion for language teaching and learning.

Even though the size of the corpus is limited, and the findings could not be generalized to the whole population of linguistic authors, some of the findings of modality in the study can provide the instruction of linguistic research article authors in their writing course on the semantic and pragmatic expectations and conventions of modalities they need to master if they want to successfully publish their research. Pragmatically, modality has interpersonal functions, among which negotiation and politeness are especially important. A better understanding of certain interpersonal aspects of from the perspective of modality, and the appropriate use of modality in writing about linguistic research articles may help non-native linguistic research article authors to make more persuasive claims in their research and to construct more appropriate writings stylistically.

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