



INTERNATIONAL JOURNAL OF  
MODERN EDUCATION  
(IJMOE)  
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## A LONGITUDINAL SFL-BASED INVESTIGATION INTO TEXTUAL FUNCTIONS OF NOMINALIZING METAPHORS IN CHINESE POSTGRADUATES' ACADEMIC WRITING

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### Article Info:

#### Article history:

Received date: 11.06.2025

Revised date: 07.07.2025

Accepted date: 21.08.2025

Published date: 01.10.2025

#### To cite this document:

Hu, S., & Hamzah, N. H. (2025). A Longitudinal SFL-Based Investigation into Textual Functions of Nominalizing Metaphors in Chinese Postgraduates' Academic Writing. *International Journal of Modern Education*, 7 (27), 147-163.

DOI: 10.35631/IJMOE.727010

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### Abstract:

While the textual functions of nominalizing metaphors have been extensively discussed in theoretical literature, empirical research in this area remains limited. Existing studies often cross-sectionally compared texts authored by students at different proficiency levels, which may inadvertently reinforce and perpetuate linear, Western-centric ideologies of language development. Longitudinal studies are comparatively rare and typically involve either qualitative analyses or a small number of participants. To address these concerns, this study examines how a cohort of 50 Chinese postgraduate students develop their use of nominalizing metaphors serving textual functions in the literature review chapters of their MA dissertations and PhD theses. The findings indicate that these students consistently used nominalizing metaphors least frequently for building cohesion through anaphoric reconstruals. However, they consistently demonstrated the highest tendency to employ nominalizing metaphors to foreground clause meanings as the focus of new information. Over time, they also placed a significantly stronger emphasis on thematizing “process > thing” metaphors as a point of departure for further argumentation, while their use of thematized “quality > thing” metaphors remained stable. The findings above suggest both shift and stability in relation to the students' use of nominalizing metaphors with textual functions. The study concludes by discussing the pedagogical implications of the above observations within the Chinese academic context.

### Keywords:

Academic Writings; Chinese Postgraduate Students; Longitudinal Investigation; Nominalizing Metaphors; Textual Function

## Introduction

Nominalizations serve crucial functions in academic and scientific discourse, such as increasing information density, fostering an objective tone, and enabling the classification of technical terms (Biber & Gray, 2021; Halliday, 1998; Hyland & Jiang, 2021). Within the framework of Systemic Functional Linguistics (SFL), nominalizations are also referred to as nominalizing metaphors (Halliday, 1994), conceptualized as arising from the stratal tension between semantics and lexicogrammar (Halliday & Matthiessen, 1999; Hao & Humphrey 2019). For instance, the nominal group the arrival of John represents a nominalizing metaphor that can be unpacked into the congruent clause John arrived, illustrating the tension between grammatical form and meaning.

In addition to the afore-mentioned functions, nominalizing metaphors play essential textual roles in structuring academic writing. By packaging clause meanings into nominal groups, they allow such meanings to occupy different positions in the clause, such as the Theme position (Halliday & Matthiessen, 2014). Since Themes typically present given or previously established information, a metaphorical nominal group in this position can serve as a point of departure for further argumentation. In this way, it sustains the flow of argumentation and contributes to the logical progression of the text (Halliday, 1998; Tavernier, 2017; Hao & Humphrey 2019).

In light of their crucial textual functions, there is a growing scholarly interest in how linguistically and culturally diverse students deploy nominalizing metaphors to structure academic discourse. Most of the studies in this area employ cross-sectional designs, commonly indicating a positive correlation between language proficiency and effective use of nominalizing metaphors. However, the reliance on cross-sectional designs has faced criticism for perpetuating a linear and Western-centric model of language development (McKinney et al., 2024). This linear perspective is also being increasingly challenged by findings from longitudinal studies, particularly those informed by a complex dynamic systems perspective (Fogal & Verspoor, 2020). In line with these critiques, Second Language Acquisition (SLA) research (Ortega & Byrnes, 2008; Ortega & Iberri-Shea, 2005) has advocated for longitudinal methodologies to better capture developmental trajectories and learning processes.

While several longitudinal studies (e.g., Gentil & Meunier, 2018; Yasuda, 2015) have examined students' use of nominalizing metaphors for textual purposes, these investigations often either focus on qualitative differences between higher- and lower-proficiency students or rely on small-scale case studies. Few studies have quantitatively tracked how such use develops over time. To address this gap, the present study quantitatively investigates how a cohort of 50 Chinese postgraduate students develop their use of nominalizing metaphors for textual purposes across the literature review (LR) chapters of their MA dissertations and PhD theses.

## Literature Review

### *Textual Functions of Nominalizing Metaphors*

Nominalizing metaphors can package clause meanings into metaphorical nominal groups that can not stand alone but must combine with other grammatical elements to form new clauses. This process inherently reorganizes the original clauses textually, resulting in newly formed clauses that exhibit different textual patterns. A survey of relevant literature (e.g., Halliday & Matthiessen, 2014; Liardét, 2013, 2016a, 2016b; Thompson, 2009) indicates several primary

textual functions of nominalizing metaphors, which are discussed and illustrated below using examples from the longitudinal corpus analyzed in this study.

The most frequently discussed textual function is cohesion. According to Halliday and Hasan (1976, p. 4), cohesion refers to “relations of meaning that exist within the text”, and it occurs when the interpretation of some element in discourse is dependent on that of another. Nominalizing metaphors can build cohesion through text referencing (Halliday, 1998; Halliday, 2004; Thompson, 2009) or anaphoric reconstrual (Liardét, 2013). During the logogenetic unfolding of a text, the writer can restate and re-summarize previously congruently expressed processes (e.g., activated) or qualities (e.g., obligatory or optional) as metaphorical nominal groups (e.g., this automatic activation; the obligatoriness and optionality):

(1) The authors thought that the L1 translation equivalents were automatically activated in processing L2, and this automatic activation boosted the semantic judgement of L2 (PhD-23);

(2) However, they can either be obligatory or optional and the obligatoriness and optionality can only become evident upon an examination of a corpus of a considerable size (MA-08).

Another important textual function is to allow the information of congruent clauses to serve as a point of departure of the message. This is because congruent clauses, once nominalized, can be placed in Theme position (i.e., clause-initial position; Halliday & Matthiessen, 2014). Since Theme is strongly associated with given information (Halliday, 1998, 2004), the clause meanings can thus serve as a point of departure of the message, moving the argument forward, as illustrated in the two metaphorical nominal groups the existence of language anxiety and the presence of a capital letter below:

(3) The existence of language anxiety is independent of first or general language learning disabilities (MA-36);

(4) Carroll et al (1971) distinguish words entirely on the basis of the form. Even the presence of a capital letter is sufficient for a form to be counted as a different word (MA-33).

Nominalizing metaphors can also foreground the meanings of congruent clauses by positioning them as the focus of new information within the message. When nominalized, clauses can be reworded as the final constituent of a clause, a position referred to as the New-rheme or N-rheme (Fries, 1992). The N-rheme represents the unmarked location for New information in the information structure (e.g., Halliday & Matthiessen, 2014; Halliday, 1997; Ravelli, 1988). Examples of nominalizing metaphors serving this textual function are presented below:

(5) The overlap of any two circles represents the interaction between the circles (PhD-01);

(6) Although the instructor did not require a certain number of pages, he did stress the importance of incorporating detail (PhD-21).

Other textual functions of nominalizing metaphors are also discussed in the literature, including what Liardét (2013) calls cause-effect networks. That is, nominalizing metaphors can interact with logical metaphors (i.e., reconstrual of conjunctions; e.g., because reconstrued as lead to) to reconstrue a complex clause into a single clause, cohesively organizing and building arguments through chains of cause-and-effect relationships:

(7) The application of ERPs has deeply promoted the development of linguistics and the formation of the neuron-linguistics. (MA-18);

(8) This introduction is followed by a detailed description of competing theories that... (PhD-18)

However, as illustrated above, this textual function, although crucial for building logical reasoning, is not achieved by nominalizing metaphors alone, but through the interaction of two different types of grammatical metaphor (GM; Halliday & Matthiessen, 2014). Since this study focuses specifically on the students' use of textual functions of nominalizing metaphors, textual functions such as cause-effect networks are not analyzed in this study. As outlined in the section on the analytical framework, this article focuses on the the first three textual functions of nominalizing metaphors discussed earlier.

### ***Research on Students' Use of Nominalizing Metaphors with Textual Functions in Academic Writing***

While many studies have recently explored lingua-culturally diverse students' use of nominalizing metaphors (e.g., Bychkovska & Lee, 2023; Pineh, 2022; Yuan, 2022), relatively few have specifically examined their textual functions. The existing research primarily utilized cross-sectional designs, analyzing and comparing texts produced by students at different proficiency or grade levels. Such methodological approaches inherently assume linear developmental trajectories in students' deployment of nominalizing metaphors with textual functions, inferring progression from observed inter-group differences.

One of the representative studies is Ryshina-Pankova (2010), who analyzed nominalization patterns in 55 book reviews composed by advanced American learners of German across three proficiency levels (levels 3–5), juxtaposed with 30 book reviews by native German speakers. The findings indicated a positive correlation between proficiency advancement and increased use of thematized nominalizing metaphors, with highest-proficiency learners approximating native speakers' uses. Similarly, Liardét (2013) compared the deployment of grammatical metaphor (GM; Halliday & Matthiessen, 2014) in argumentative essays between three first-year and three fourth-year university students, focusing on four functional patterns: anaphoric reconstrual, elaborated nominal groups, cause-effect networks, and meaning accumulation. The analysis indicated marked developmental differences: fourth-year university students produced substantially longer texts with greater GM incidence and exhibited more sophisticated command of metaphorical resources for cohesion and argument organization. Using the similar analytical framework, Liardét (2016a) compared the use of GM by 10 high and low performing students of mixed language backgrounds in argumentative essays. It was reported that high performing students not only demonstrated higher control and proficiency over these reconstrual patterns but also made a more frequent use of such patterns. A similar finding was reported in Thompson's (2009) comparative analysis of ten high- and low-rated MA theses, where high-rated texts exhibited marginally higher frequencies of nominalizations with cohesive functions.

The above cross-sectional studies suggest linear progression in students' nominalization use for textual functions, demonstrating a positive correlation between proficiency and capacity to use this type of metaphor. However, this linear model has been increasingly critiqued in Second Language Acquisition (SLA) research (Larsen-Freeman, 2006, 2023; Ortega, 2014, 2019) as misrepresenting actual language development. Recent decolonial scholarship has similarly

challenged this paradigm, arguing that it reflects and perpetuates Western-centric, colonial assumptions about language learning that warrant critical examination (Kubota, 2022; McKinley, 2022; McKinney et al., 2024). These converging critiques underscore the need to move beyond cross-sectional comparisons when examining students' deployment of nominalizations serving textual functions.

Several longitudinal studies have also contributed to this area of research. One strand of longitudinal inquiry has specifically compared the use of nominalizing metaphors between high- and low-proficiency students. Findings from these studies consistently indicate that higher-proficiency students exhibit greater mastery in deploying nominalizing metaphors for textual functions, employing them more frequently and effectively in their writing. For instance, Yasuda (2015) investigated how 30 undergraduate students at differing proficiency levels employed GM in summary writing over a semester-long genre-based course. The study revealed that, following genre-based instruction, high-proficiency students displayed enhanced ability to use nominalizations for textual reorganization, as reflected in both increased normalized frequencies of GM and qualitative differences in their summaries. Similarly, Gentil and Meunier (2018) tracked two students' use of nominalizing metaphors over a four-year period. Their findings demonstrated that the high-proficiency student already exhibited near-expert command of nominalizations for textual organization in the first year, with minimal subsequent development. In contrast, the low-proficiency student displayed limited use of GM resources and continued to face challenges in employing nominalizations to construct coherent logical progression. In addition to concerns about classifying students into high- and low-proficiency groups based on idealized monolingual norms (Kubota, 2022; McKinney et al., 2024), this line of inquiry tends to focus on qualitative analyses of students' use of nominalizing metaphors, without incorporating quantitative analysis to further verify the qualitative findings.

Another line of longitudinal research has examined students' use of nominalizing metaphors with textual functions holistically. These studies did not observe significant development in students' deployment of nominalizing metaphors serving textual purposes. To illustrate, Liardét (2016b) employed two descriptors (i.e., anaphoric reconstrual; nominal group elaboration) to assess the impact of nominalizing metaphors on textual cohesion and structure over time in the writing of five Chinese undergraduate English majors. The findings revealed no substantial progression across the four semesters examined. Similarly, Baratta (2010) reported minimal change in the use of nominalizations serving cohesive functions in six undergraduate students' academic writing throughout a three-year bachelor's program. While these studies have quantitatively examined students' use of nominalizing metaphors for textual purposes, their limited corpus sizes may undermine the generalizability of the findings.

To address the concerns outlined above, the present study investigates how a cohort of 50 Chinese postgraduate students developed their use of nominalizing metaphors for cohesive functions in their MA and PhD LR chapters over time. The relatively large number of participants, along with the larger corpus size (as shown below), enhances the generalizability of the study's findings. Moreover, the longitudinal design allows for a more reliable and direct characterization of how students develop their use of nominalizing metaphors with textual functions, in contrast to cross-sectional designs adopted in some of the studies reviewed earlier.



### **Corpus**

This study draws on a longitudinal corpus comprising two sets of academic texts: 50 literature review (LR) chapters from MA dissertations and 50 from PhD theses. Both sets were sourced from the China National Knowledge Infrastructure (<https://www.cnki.net/>) and were authored by the same cohort of 50 Chinese postgraduate students who obtained their PhDs from 12 different universities in China. Most of the MA dissertations and PhD theses were written in different years, with an average interval of approximately 8 years between the paired submissions (ranging from 3 to 16 years). The LR chapter was selected for analysis because it was observed to frequently employ nominalizing metaphors, which helps the author summarize prior research and reorganize information (Yasuda, 2015), while helping to avoid plagiarism (Drury, 1991).

All texts analyzed in this study come from the field of applied linguistics. This discipline was chosen in part because it is one of the few in China that require postgraduate theses and dissertations to be written in English. Additionally, restricting the dataset to a single disciplinary context helps control for variations in language use that can be attributed to disciplinary variations. Table 1 presents the metadata for the longitudinal corpus used in this study.

**Table 1: Meta-Information of The Longitudinal Corpus**

<b>Self-compiled corpus</b>	<b>Number of LR chapters</b>	<b>Number of words</b>	<b>Average text length</b>
MA LR chapters	50	221,105	4,422
PhD LR chapters	50	577,344	11,547

### **Methodology**

This section first discusses the criteria for identifying nominalizing metaphors in the longitudinal corpus and then discusses the coding schemes for textual functions of these metaphors as well as how the nominalizing metaphors with these textual functions can be identified.

#### ***Analytical Framework for Identifying Nominalizing Metaphors***

The nominalizing metaphors analyzed in this study include two main types: “quality > thing” metaphors (e.g., his confidence) and “process > thing” metaphors (e.g., the use of a linguistic form). To identify these two types, we applied the following criterion. That is, a candidate for nominalizing metaphor should be capable of being unpacked into a more congruent expression. To achieve this end, we applied the tests of derivation (Ravelli, 1988) and agnation (Gleason, 1965; Hao, 2020). The former test determines whether a more congruent form can be morphologically derived from a nominalizing metaphor candidate (McGrath & Liardét, 2023). The latter examines whether the candidate and its potential congruent form share “the same major lexical items” (Gleason, 1965; Hao, 2020). To illustrate how the two tests were applied, here are three example nominalizing metaphors:

(9) Such a comment by the researcher himself indicated his confidence in the thoroughly elaborative nature of the analysis tool... (PhD-21);

(10) Human beings are born to be isolated and are... This inherent isolation drove them to seek cooperation with others (PhD-23);

(11) According to Richards (Richards, et al.2000) error is the use of a linguistic form (in the speech or writing of a second or foreign language) in a way (MA-04).

The nominal group his confidence... in (9) represents a ‘quality > thing’ metaphor, which can be unpacked into the relational clause he is confident in the thoroughly elaborative nature of the analysis tool. This clause shares the same key lexical items as the original nominal group. In (10), this inherent isolation exemplifies a ‘process > thing’ metaphor. It refers anaphorically to the previous sentence, which serves as its congruent agnate and shares core lexical items at the semantic level (Gleason, 1965). The use of a linguistic form in (11) is also a ‘process > thing’ metaphor. Such metaphors typically contain at least two central lexical items (i.e., use and a linguistic form) that correspond directly to two core transitivity components (Martin & Rose, 2007) in its possible congruent agnate clause [people] use a linguistic form.

Based on the identification criteria outlined above, the first author manually annotated the nominalizing metaphors in the longitudinal corpus using the UAM Corpus Tool, in collaboration with the second author. An initial annotation of 20% of the data was conducted by the first author. During this process, ambiguous or borderline cases were recorded and discussed with the second author, with all intermediate cases resolved and final decisions reached. Following the initial annotation, the first author independently annotated the remaining data. After completing this stage, an additional month was spent reviewing all annotated nominalizing metaphors by category to ensure that instances within each category exhibited consistent formal and functional characteristics. Upon completion of this verification process, all retained nominalizing metaphors were analyzed subsequently for their textual functions.

### *Coding Schemes for Textual Functions of Nominalizing Metaphors*

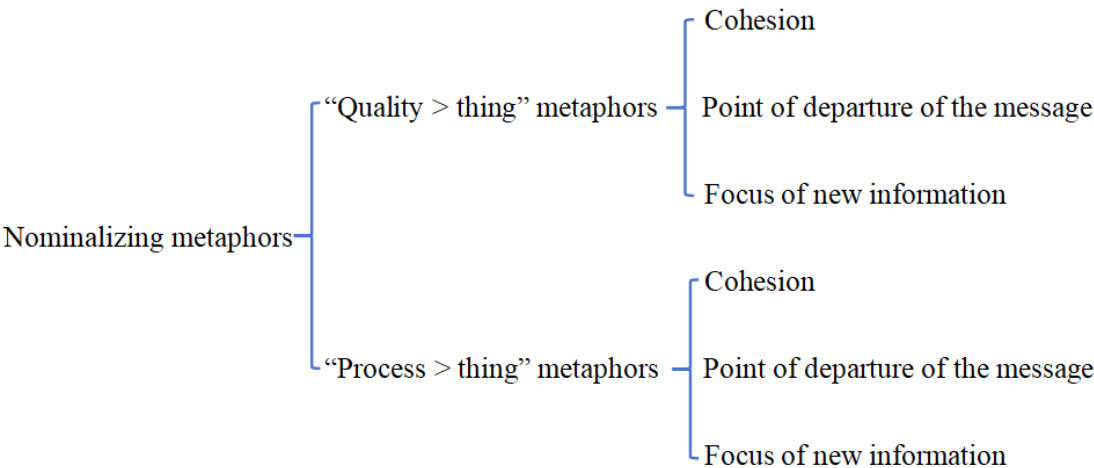
After the nominalizing metaphors were annotated and verified, the coding schemes for their textual functions were developed using the UAM Corpus Tool. As mentioned earlier, this article focuses on three key textual functions of nominalizing metaphors: cohesion, point of departure of the message, and focus of new information (see Table 2). Since these functions are discussed earlier, they are not reiterated here. A brief summary of these functions is presented in Table 2.

**Table 2: Analytical Framework for Textual Functions of Nominalizing Metaphors**

Textual function (Coding tag)	Description	Example
Cohesion	Nominalizing metaphors reconstrue previously congruently expressed processes or qualities in nominalized forms	The authors thought that the L1 translation equivalents were automatically activated in processing L2, and this automatic activation boosted the semantic judgement of L2 (PhD-23)
Point of departure of the message	Nominalizing metaphors repackage congruent clauses as Subject themes (initial position of the clause)	Even the presence of a capital letter is sufficient for a form to be counted as a different word (MA-33)

Focus of information within the message	of Nominalizing metaphors repackaging congruent clauses as Nominal N-rhemes (at the end of the clause)	The overlap of any two circles represents the interaction between the circles (PhD-01)
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To provide a clear illustration of how the two types of nominalizing metaphors were coded for their textual functions, the coding schemes developed using the UAM Corpus Tool are presented in Figure 1.



**Figure 1: Coding Schemes for Textual Functions of Nominalizing Metaphors**

It is worth noting that identifying whether nominalizing metaphors serve a cohesive function is relatively straightforward. If either of the two sentences preceding the one containing the nominalizing metaphor includes a congruent clause that is agnate to the nominalizing metaphor, the metaphor is considered to perform a cohesive function. This study limited the scope to the two preceding sentences because, based on a pilot analysis of 500 instances, all relevant cohesive links were found within this range. This criterion thus helped ensure more consistent identification of nominalizing metaphors functioning cohesively. To determine whether a nominalizing metaphor performed the other two textual functions, additional identification criteria were developed, as discussed in the next section.

***Criteria for Identifying Nominalizing Metaphors as Theme and N-Rheme***

As noted earlier, nominalizing metaphors perform the latter two textual functions, when placed in the Theme or N-rheme positions, respectively. Therefore, the unit of analysis for identifying Themes or N-rhemes in sentences with nominalizing metaphors is important.

Following Thompson (2014) and Herriman (2011), this study has selected the T-unit as the basic unit of analysis. T-unit is “an independent clause together with all the clauses that are dependent on it” (Thompson, 2014). Thus, if a sentence has more than one independent clause, there will be two units, each with its own theme (Thompson, 2014). In Examples (12) and (13), the T-units are separated by dashed lines, and the theme-rheme boundary is marked by #.

(12) This # is most commonsensical definition of synonymy, // but it # is also the most problematic one (PhD-22);



(13) Or, the learner # may have studied both synforms // but since the knowledge of both is insecure, # he or she is not sure which word form is associated with which meaning (MA-33).

The identification of Theme is based on the criterion that “theme goes up and includes the first experiential element in the clause” (Thompson, 2014). The first experiential element is referred to in SFL as experiential/topical Theme, which may be preceded by textual Themes (e.g., conjunctive adjunct; thirdly; to be specific) or interpersonal Themes (e.g., modal adjunct or projecting clause; inevitably; it is possible that):

(14) Recognition of Dutch words # was facilitated when words had higher degrees of orthographic similarity with English (PhD-33)

(15) Thirdly, the evaluation of the compositions # only focuses on the form and organization rather than on content (MA-04)

(16) Inevitably, the translation of AND # will be influenced by its functions in the discourse (PhD-08)

(17) It is possible that the development of politeness markers # is similar in one way, but different in another (PhD-31)

Our identification of N-rhemes is based on syntactic (positional) and semantic properties. Syntactically, N-rheme is identified as “the last constituent on the independent clause level” (Herriman, 2011). This means that N-rheme can be a nominal group (18), a full dependent clause (19), a prepositional phrase (20), an imperfective non-finite clause (21), and other grammatical units.

(18) Burke advocates the unification of content and form (PhD-23)

(19) Just as Zimmerman noted, in the composing process it is not easy to distinguish between process goals and outcome goals, since the completion of process goals are for the sake of outcome goal. (PhD-21)

(20) As mentioned previously, the concept of audience has undergone noticeable changes since its emergence (PhD-23)

(21) Among 33.171 essays, 71 of them were submitted only once for scores, indicating the limited use of the system. (PhD-15)

Semantically, N-rheme is restricted to “the last constituent which has experiential meaning” (Herriman, 2011). This study only considered the case in which N-rheme fully conflates with a nominalizing metaphor, as in (18). In such cases, the nominalizing metaphor enables the meaning of congruent clauses to be foregrounded as the focus of information as a whole (Martin, 1993), while in other cases, nominalizing metaphors do not perform this textual function.

Based on the criteria and coding schemes outlined earlier, the nominalizing metaphors were analyzed manually for their textual functions using the UAM Corpus Tool. As with the identification of nominalizing metaphors discussed earlier, the first author coded 20% of the instances for their textual functions. All ambiguous or borderline cases were documented and subsequently resolved through discussion with the second author. Following this, the first author independently annotated the remaining data and then spent an additional two weeks verifying that all nominalizing metaphors assigned to the same textual function consistently

exhibited that function. Any instances incorrectly coded were excluded at this stage. After this round of verification, the raw frequencies of nominalizing metaphors corresponding to the three textual functions were automatically calculated using the UAM Corpus Tool. These raw frequencies were then normalized per 10,000 words to facilitate comparison between the MA and PhD LR chapters.

To examine whether each type of nominalizing metaphor showed statistically significant differences over time, paired-sample t-tests were conducted using SPSS (version 27.0). In addition, the range of each type of nominalizing metaphor across the longitudinal corpus was calculated as an indicator of intra-group variation. This was done by dividing the number of literature review chapters containing at least one instance of the target nominalizing metaphor by the total number of chapters (Hunston, 2022).

### Results and Discussion

The present study has considered how the same group of Chinese postgraduate students' use of nominalizing metaphors with textual functions changed from MA to PhD writing. Three observations are noteworthy (see Table 3).

**Table 3: Comparisons of Nominalizing Metaphors Serving Different Textual Functions Between the MA And PhD LR Chapters**

Category	Corpus Textual function	MA LR chapter			PhD LR chapter			P-value <sup>c</sup>	Cohen's <i>d</i> <sup>d</sup>
		Raw	Normed <sup>a</sup>	Range <sup>b</sup>	Raw	Normed	Range		
“Quality > thing” metaphors	Cohesion	9	0.400	7/50	22	0.398	15/50	0.993	0.001
	Point of departure of the message (Subject Theme)	98	4.681	39/50	282	4.659	45/50	0.976	0.004
	Focus of information within the message (N-Rheme)	165	7.490	42/50	484	8.144	47/50	0.490	0.098
“Process > thing” metaphors	Cohesion	23	1.184	18/50	59	0.975	26/50	0.550	0.085
	Point of departure of the message (Subject Theme)	290	14.780	50/50	991	18.537	50/50	0.019*	0.342
	Focus of information within the message (N-Rheme)	474	22.584	50/50	1349	23.438	50/50	0.675	0.060

<sup>a</sup> Normed = mean normalized frequency.

<sup>b</sup> Range was calculated by dividing the number of the LR chapters that contain at least one instance of the target nominalizing metaphor by the total number of LR chapters.

<sup>c</sup> \* denotes  $p < .05$ .

<sup>d</sup> Cohen's *d* is used to measure the effect size. The formula is  $d = (M_1 - M_2) / SD_{\text{pooled}}$  or  $(M_2 - M_1) / SD_{\text{pooled}}$ , depending on the size relationship between  $M_1$  and  $M_2$ . Values of 0.2, 0.5, and 0.8 are considered small, medium, and large effects, respectively (Cohen, 1988).

First, among the three textual functions, “quality > thing” and “process > thing” metaphors were least frequently used to achieve cohesion through anaphoric reconstrues over time, with their normalized frequencies showing little change throughout the observed period. This

suggests that the Chinese postgraduate students consistently demonstrated a low tendency to construct cohesion through anaphoric reconstrues in their use of nominalizing metaphors:

(22) The authors thought that the L1 translation equivalents were automatically activated in processing L2, and this automatic activation boosted the semantic judgement of L2 (PhD-23);

(23) However, they can either be obligatory or optional and the obligatoriness and optionality can only become evident upon an examination of a corpus of a considerable size (MA-08).

One possible reason for the infrequent use of nominalizing metaphors' cohesive function is that this low frequency may be a characteristic of student academic writing itself. This interpretation arises from an approach that respects student writing on its own terms (Chau, 2015; Gudmestad et al., 2021; Man & Chau, 2019). That is, the students' language use is examined without reference to any external norms, in contrast to some previous longitudinal studies (Yasuda, 2015; Gentil & Meunier, 2018) that viewed increased use of this cohesive function as a marker of higher language proficiency. Further, the finding above aligns with Baratta's (2010) observation that undergraduate students tended to infrequently used nominalizations for anaphoric reconstruals throughout their three-year bachelor program, despite differences in lingua-cultural backgrounds among Baratta's (2010) participants and those in the present study. Together, these findings suggest that the normalized frequency of such nominalizing metaphors may not be a reliable reflection of lingua-culturally diverse students' ability to deploy them. Nevertheless, the increasing range of both "quality > thing" and "process > thing" metaphors for cohesive purposes underscores their growing significance in higher levels of academic writing, although this increase may partly arise from the greater average length of the PhD LR chapters. This widening range also emphasizes the importance of raising postgraduate students' awareness of how nominalizing metaphors can reconstrue previously congruently expressed qualities or processes in academic writing.

Second, thematized "quality > thing" and "process > thing" metaphors exhibited different patterns of change over time. The normalized frequency of thematized "quality > thing" metaphors remained relatively stable, while the use of thematized "process > thing" metaphors increased significantly. Throughout their writing, the Chinese postgraduate students showed a consistent tendency to place "quality > thing" metaphors in the Theme position as a point of departure for further argumentation (24). However, they placed significantly greater emphasis on using "process > thing" metaphors for the same textual purpose (25) over time.

(24) To be specific, the persuasiveness of the rhetor # entails an appropriate arrangement of arguments framed from the fountainhead of topoi (PhD-23);

(25) Recognition of Dutch words # was facilitated when words had higher degrees of orthographic similarity with English (PhD-33).

The above finding offers important empirical evidence on students' use of thematized nominalizing metaphors over time. Previous research (Ryshina-Pankova, 2010; Yasuda, 2015; Gentil & Meunier, 2018; Liardét, 2013) generally suggests that students tend to employ such metaphors more frequently as their proficiency develops, based on the common observation that higher-proficiency or expert writers make greater use of thematized nominalizations in academic texts. Theoretical discussions (Halliday, 1998, 2004; Thompson, 2014) appear also

to support this hypothesized developmental trajectory, emphasizing the essential role of thematized nominalizing metaphors in backgrounding clause-level meanings and providing a point of departure for further reasoning. While earlier studies have hypothesized or stipulated this developmental progression, the present study, based on longitudinal data, reveals differences in the evolving use of thematized “quality > thing” and “process > thing” metaphors, as discussed above. These differences suggest that the capacity to nominalize process meanings in the Theme position is a key capacity developed by this group of Chinese postgraduate students after several years of PhD training. This capacity may be particularly important for constructing more advanced levels of LR writing of applied linguistics, where the actions of researchers and research participants (e.g., the review of the literature; recognition of Dutch words) are frequently back-grounded as frame of reference within which the subsequent argument is developed (Fries, 2004).

Third, both types of nominalizing metaphors were most frequently used in the N-Rheme position in the MA and PhD LR chapters, with their normalized frequency remaining relatively stable over time. As previously noted, the N-Rheme represents the default location for the message’s informational focus, typically carrying what is presented as newsworthy or important (Fries, 1997, 2004; Halliday, 2004). This finding suggests that the Chinese postgraduate students consistently emphasized foregrounding clause meanings as the focus of new information in their use of nominalizing metaphors (26; 27), although this emphasis did not increase significantly over time.

(26) A clausal relation refers to the interconnectedness of clauses and sentences. (PhD-08);

(27) Deletion of a thesis statement might involve a reconstruction of main idea. (PhD-21).

One possible explanation is that the Chinese postgraduate students may have already developed the capacity to encapsulate clause meanings into the N-Rheme position during the writing of their MA LR chapters. This explanation is supported by the high normalized frequencies and wide distributions of nominalizing metaphors, particularly “process > thing” metaphors, in the longitudinal corpus. The finding above also provides important empirical evidence for research on the textual functions of nominalizing metaphors (Halliday & Martin, 1993; Hao & Humphrey 2019) by quantitatively examining how students learn to deploy this textual function over time—an aspect rarely addressed in previous research, which has typically focused on qualitative cross-sectional comparisons of a limited number of high- and low-proficiency students’ writing (Gentil & Meunier, 2018; Yasuda, 2015).

Moreover, the relative frequencies of nominalizing metaphors in the Theme and N-Rheme positions observed in this study is inconsistent with Halliday’s (2004) hypothesis, which suggests that nominalizations as Theme is a more important pattern in scientific English than nominalizations as N-Rheme. The discrepancies observed here may be attributed to several factors, including the nature of LR writing, disciplinary variation, and the writers’ linguistic backgrounds. All this remains to be confirmed in future research.

This study carries both methodological and pedagogical implications. Methodologically, it highlights the advantages of a longitudinal design over a cross-sectional one in capturing how students develop the use of nominalizations for textual functions. Whereas cross-sectional designs infer a linear progression toward an external norm about the use of nominalizing metaphors—often modelled on monolingual native or expert writers—longitudinal designs

offer direct evidence of developmental trajectories. They allow researchers to trace increases, decreases, stability, and relative rates of change in the use of nominalizing metaphors over time. As such, they can yield more nuanced and reliable insights into students' evolving language use, providing an empirical foundation for more responsive and evidence-based instruction in academic writing, as discussed below.

Pedagogically, although the theoretical significance of nominalizing metaphors for textual purposes has been widely acknowledged (e.g., Halliday, 1998; Hao & Humphrey, 2019; Thompson, 2014), this study empirically demonstrates how Chinese postgraduate students deployed them in practice and how their usage patterns shifted—or did not shift—over time, without imposing external expectations on their language use (see Chau, 2015; Gudmestad et al., 2021). Notably, nominalizing metaphors serving cohesive functions were the least frequently used and showed no significant change over time. This suggests that normalized frequency should not be a central concern in instruction. However, given the expanding range of such metaphors in the longitudinal corpus, it may still be useful for writing instructors to raise students' awareness of their potential cohesive function in academic texts. The significant increase in “process > thing” metaphors in Theme position, compared to the stable use of thematized “quality > thing” metaphors, suggests that greater instructional attention could be devoted to helping postgraduate students understand and deploy thematized “process > thing” metaphors and their specific textual functions in meaning-making. Meanwhile, the consistently high normalized frequency and the expanding range of nominalizing metaphors in the N-Rheme position indicate that students at the postgraduate level may be already familiar with this textual function. Therefore, pedagogical focus may be more usefully directed toward other areas, such as thematized nominalizations, particularly of processes.

Importantly, this study does not advocate for students to replicate the normalized frequencies reported here in their writing. The observed quantitative patterns can be understood as descriptive insights into the developmental use of nominalizing metaphors for textual purposes among the 50 Chinese postgraduate students, rather than as prescriptive models for instruction. Academic writing should be viewed as a dynamic process of meaning-making, shaped by students' communicative intentions and the demands of their academic tasks (Sembianti & Tian, 2021). Linguistic choices emerge organically from these contexts, rather than being driven by fixed norms or generalized usage frequencies (Li, 2022; García, 2019; García et al., 2021).

Before we conclude, we must note two limitations of this study. First, this study only compared the students' use of nominalizing metaphors with textual functions at two time points. It remains unclear whether some of the significant changes follow a linear trajectory or embody fluctuations. Future research could consider analyzing students' academic articles or reports produced during their PhD candidature as representative of their language use at an intermediate stage between the writing of their MA dissertations and PhD theses. Second, this study only analyzed students' written texts. It can only interpret the research findings from a textual perspective without really knowing how students' cognition and personal experiences influenced their deployment of nominalizing metaphors over time. Future research could explore this further by employing ethnographic methods (Coffin & Donohue, 2012), such as semi-structured interviews, to uncover possible causes of the changes in the students' use of nominalizing metaphors over time.



## Conclusion

This study was conducted in response to the predominance of cross-sectional comparisons of students' use of nominalizing metaphors for textual functions, and the lack of large-corpus-based longitudinal investigations that quantitatively track such usage over time. To address these concerns, this study examined the same group of 50 Chinese postgraduate students' use of nominalizing metaphors serving textual functions in their MA and PhD LR chapters. Three key observations emerged from the analysis.

First, "quality > thing" and "process > thing" metaphors were consistently least frequently used for achieving cohesion via anaphoric reconstrues, indicating a stable, low tendency among Chinese postgraduate students to build cohesion through such metaphors. Second, while the normalized frequency of thematized "quality > thing" metaphors remained stable, thematized "process > thing" metaphors increased significantly. The Chinese postgraduate students consistently used "quality > thing" metaphors as a point of departure for further argumentation but placed significantly stronger emphasis on thematized "process > thing" metaphors for the same purpose. Third, both types of metaphors appeared most frequently in the N-Rheme position, with stable frequency over time. This suggests that the Chinese postgraduate students consistently used nominalizing metaphors to foreground clause meanings as the focus of new information, though this emphasis did not grow significantly over time.

This study has both methodological and pedagogical implications. Methodologically, it demonstrates the advantages of a longitudinal design over a cross-sectional one. Whereas cross-sectional designs often infer linear progression toward an external, idealized end state, which has been increasingly critiqued for reinforcing Western-centric and colonialist language ideologies, a longitudinal design offers direct evidence of language learning and development. It enables researchers to trace increases, stability, and relative rates of change in the use of nominalizing metaphors for textual functions. Pedagogically, the longitudinal findings support the development of more targeted academic writing instruction. For instance, the consistently low normalized frequency of nominalizing metaphors serving cohesive functions may reflect a characteristic of student academic writing rather than a deficiency to be corrected. Moreover, the significant increase and stable use of other textual functions can inform instructors' decisions about how to allocate instructional resources more effectively, based on actual patterns of language development.

## Acknowledgements

The authors would like to express their sincere gratitude to Universiti Malaya for their invaluable support and resources that made this research possible.

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