



Research Article

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“Establish a niche” via *negation*: A corpus-based study of *negation* within the Move 2 sections of PhD thesis introductions

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Abstract: The past few decades have witnessed an upsurge of scholarly interest in the generic descriptions of PhD theses following Swales’ seminal *Genre Analysis*. Fitted within the Create A Research Space (CARS) model, the thesis introduction plays a key role in justifying research originality/significance, where novice writers engage with academic communities through “establishing a research territory” (Move 1), “establishing a niche” (Move 2), and “occupying the niche” (Move 3). As the hinge of the CARS model, Move 2 (hereinafter EN) is of strategic importance as it enables writers to “sell” their ideas by pointing to the gap/niche in the “marketplace” of previous research, which is typically realized through the co-occurrences of *negation* alongside other interpersonal language resources. *Negation*, as a *disclaim* marker within Martin and White’s *appraisal* framework, is a prominent linguistic indicator of EN. Nevertheless, little research has systematically examined the use of *negation* in ENs of PhD thesis introductions. Accordingly, the study investigated *negation* via the *appraisal* framework addressing subtypes of *negation* (*disalignment*, *cautious detachment*, *unfulfilled expectation*) within ENs in the introduction sections of 120 PhD theses. The results showed that *disalignment* is the most frequent subtype of *negation*, while “not” and “no” are commonly used as indicators of *negation*. Our findings also revealed intriguing co-occurrences of *negation* sub-categories alongside other relevant *appraisal* resources. The corpus-informed results are expected to shed light on the nature and practice of PhD theses that educators may take into account during thesis writing instruction.

Keywords: *negation*, *appraisal*, niche establishment, introduction sections, PhD theses

1 Introduction

With the development of English for Academic Purposes (EAP) over the past 30 years, a large body of research has looked into PhD theses and their linguistic features (Paltridge and Starfield 2020). PhD theses are viewed as dialogic in nature considering the language is used to represent real-world realities while acknowledging, negotiating, and constructing social relations in the academic genre (Hyland 2005b, 2007). Accordingly, thesis writers’ abilities to effectively utilize interpersonal language resources so as to clarify authorial stance, engage with alternative positions, and establish solidarity with academic communities are generally perceived as a crucial factor for successful thesis writing (Loghmani et al. 2020).

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Interpersonal discourse strategies are particularly vital for the introduction section where thesis writers “create a research space” (CARS, Swales 1990) to justify the significance and originality of research by “establishing a research territory” (Move 1), “establishing a niche” (Move 2), and “occupying the niche” (Move 3).¹ As the hinge that connects Move 1 (what has been done previously) to Move 3 (what the present research is about), Move 2 (hereinafter EN²) is of strategic importance since it establishes the motivation for the study (Swales and Feak 2002). Nevertheless, the failure to establish a niche has been recognized as a key shortcoming in thesis writing (Allison et al. 1998). According to Paltridge and Starfield (2020), such failure is in particular intensified by the difficulties in using negative evaluative language, which is typically activated by *negations* in gap statements, e.g. “has *not* received much attention” (p. 87).

Negation, as a *disclaim* marker within Martin and White’s (2005) *appraisal*³ framework, combines with other interpersonal language resources to help construct writer–reader relationships at the discourse-semantic stratum (Hood 2006). In academic writing, writers have to take their readers into account, anticipate readers’ expectations, and interface with anticipated conflict with writers’ own positions so as to legitimize the authorial voice (Martin and White 2005). *Negation* functions as a powerful means for writers to emphasize authorial voice by denying any alternative position and thus it is particularly vital for argumentative genres. As a “mini-critique” (Swales and Feak 2002, 348), Move 2 of PhD thesis introductions is argumentative in nature, where *negation* is found to be a prominent linguistic indicator in this section (e.g. Paltridge and Starfield 2020). Nevertheless, few studies have systematically examined the forms and functions of *negation* in ENs of PhD thesis introductions, and the co-occurrences of *negation* alongside other interpersonal resources in PhD thesis introductions remain something of a neglected issue.

To address the abovementioned research gaps, this study set out to investigate the use of *negation* in Move 2 of PhD thesis introductions. The researchers probed into the taxonomy of *negation* and examined the co-occurrences of *negation* subtypes together with other relevant evaluative resources drawing on Martin and White’s (2005) *appraisal* framework. The findings are expected to not only enrich our understanding of the *appraisal* system and offer new insights into the ways *appraisal* resources are co-articulated, but also enlighten our use of interpersonal language resources which are expected to better inform thesis writing practice and provide implications for EAP instruction.

2 Literature review

2.1 PhD theses

There has been a growing interest in PhD theses and their language features among EAP scholars over the past few decades (e.g. Hyland and Shaw 2016, Soler-Monreal et al. 2011, Xiao and Sun 2020). According to the British convention, PhD theses are the lengthy documents written by doctoral students denoting the culmination of doctoral research and submitted in support of candidature for doctoral/PhD degrees (Thompson 2013). In order to be admitted to the academic community, thesis writers need to exhibit both the competence to independently conduct original research and the ability to produce high-quality

¹ The CARS model was initially proposed by Swales (1990) based on his investigation into research article introductions. Current understandings of the structure of PhD thesis introductions were derived from the exploration of research article introductions, primarily carried out by Swales (1990), and have found similarities regarding the typical moves of thesis introductions and research article introductions. For example, Paltridge and Starfield (2020) summarized the typical main structure of thesis introductions which contains three moves: (1) establishing a research territory, (2) establishing a niche, and (3) occupying the niche.

² Following the style proposed by Moghaddasi and Graves (2017), the move of “establishing a niche” is abbreviated to EN, move EN, or Move 2.

³ Following the conventions of Systemic Functional Linguistics (SFL), labels for the *appraisal* resources are presented in italics. The symbol is adopted throughout this article.

pieces of writing (Paltridge and Starfield 2020). As a consequence, the value of PhD theses not only lies in the ideas and arguments being sustained, but also involves their appropriate employment of linguistic and social conventions that the academic community finds convincing (Loghmani et al. 2020). As argued by Hyland (2009), thesis writers have to reinforce their credibility through communicating persuasiveness and a relationship with their subject matter and expert audience. However, many PhD candidates face enormous challenges in conforming to the genre-specific writing conventions (Thompson 2016). Thus, understanding how successful thesis writers project themselves into the particular genre can have implications for the pedagogy and practice of thesis writing as well as contributing to the development of EAP more generally.

Thus far, textual analyses of PhD theses have been carried out at a macro level and/or a micro level (e.g. Bunton 2002, Xiao and Sun 2020). At a macro level, researchers have utilized the Introduction-Method-Results-Discussion (IMRD) model (Swales 1990) to explore PhD theses' overall structure (e.g. Paltridge and Starfield 2020) or prominent “part-genres” (Swales and Feak 2002, 8) such as PhD thesis introductions (Bunton 2002, Ono 2017), literature reviews (Kwan 2006), conclusions (Bunton 2005), and acknowledgements (Hyland 2004, Peng 2010). The macro perspective stresses form-function dependency and explores how particular communicative purposes are achieved. By comparison, at a micro level, scholars have focused on language features, e.g. lexical diversity (Xiao and Sun 2020), linking adverbials (Lei 2012), and lexico-grammatical stance expressions (Chan 2015) in part-genres of PhD theses. Taken together, previous studies on PhD theses have found similar communicative goals within each (part-)genre which could be realized via distinctive rhetorical strategies and linguistic features.

Among the prominent part-genres of PhD theses, it is widely recognized that the introduction section is a crucial but challenging one, considering its key role in justifying the significance and originality of the research (Bhatia 2013). Since one of the core criteria for assessing PhD theses in most universities is on whether the submission has made original contributions to the specific research field (Bunton 2002), thesis writers need to strategically create a “research space” (Allison et al. 1998, 212). However, this is actually difficult for apprentice scholars for a range of reasons (Bunton 2002), and the failure to create a research space is regarded as a major shortcoming especially in the thesis writing of non-native English speakers (Allison et al. 1998).

Accordingly, the part-genre of the PhD thesis introduction has continued to motivate a large number of studies following the Genre Analysis and the Create A Research Space (CARS) model proposed by Swales (1990). According to the CARS model, an introduction is in most cases realized via three moves: (a) “establishing a research territory,” (b) “establishing a niche,” and (c) “occupying the niche.” The phenomenon is denoted as “rhetorical movement” (Swales 1990, 140), in which a move is defined as “a segment of text that is shaped and constraint by a particular communicative function” (Holmes 1997, 325). To be more specific, Move 1 establishes a research territory by providing background information, reviewing previous research, and defining key terms. Move 2 establishes a niche via indicating a research gap, highlighting the need to extend present knowledge, and/or justifying the need to solve an existing problem. Finally, Move 3 occupies the niche through presenting research aims and hypotheses, stating research value, and outlining the present study.

Move 2 “establishing a niche,” as the hinge of the CARS model, enables thesis writers to “sell” their ideas by pointing to the gap/need in the “marketplace” of previous research (Paltridge and Starfield 2020). As claimed by Bunton (2002), for PhD theses as a genre, the link between Move 1 and Move 3 is of strategic importance because the primary communicative purpose of a PhD thesis is to demonstrate to its examiners that the candidate has made original contributions to knowledge in the targeted field. To this end, *negation* resources alongside other interpersonal rhetorical strategies are generally used to co-construct ENs at the discourse-semantic stratum (e.g. Swales and Feak 2002).

According to Swales and Feak (2002), the most common way to indicate research gaps is to use negative (e.g. not, no) or quasi-negative (e.g. few, little) subjects, for instance, “no studies/data/calculations to date have...,” “little research has....” At the same time, other interpersonal resources may be added to resonate with (quasi-)negative subjects, such as “to the best of our knowledge, few attempts...,” “however, little information...,” etc. In line with Swales and Feak (2002), Shehzad (2008) summarized three main categories

of linguistic indicators used for gap establishment, including (quasi-)negatives, quantifiers, contrastive statements, with three examples cited below.

Example (1). To the best of our knowledge, no work has been published on the[...] (p. 42).

Example (2). There is so far very little empirical evidence that communication of defect information among inspectors yields significant gains[...] (p. 41).

Example (3). However, software visualizations are often too simplistic and lack visual clues for the viewer to correctly interpret them[...] (p. 36).

In Example (1), negative indicator “no” is used to pinpoint the niche that might not have received sufficient attention. Example (2) and Example (3) adopt quantifier “little” and contrastive statement “however,” respectively, to point out the shortcomings of previous research, preparing the ground to accommodate the present work.

Taken as a whole, the move EN of PhD theses has in most cases been addressed from a macro level to investigate how it is realized via different rhetorical steps or how it achieves particular communicative functions based on the CARS model. Nevertheless, few scholars have specifically focused on the EN move from a micro level, not to mention a thorough investigation of interpersonal resources in ENs. This is despite the fact that novice writers may find it challenging to project themselves into academic writing while taking a proper stance to communicate credibility to both subject matters and expert examiners (Hyland 2009, Loghmani et al. 2020). However, as claimed by Bitchener and Basturkmen (2006), interpersonal language resources are generally not explained explicitly to novice writers since “supervisors themselves tend to have tacit rather than explicit knowledge of the features of the thesis in their own disciplines” (p. 6). Furthermore, previous literature of interpersonal strategies in academic texts has by and large concentrated either on research articles or on students’ writing at earlier stages of education (Geng and Wharton 2016). In comparison, the use of interpersonal devices in PhD theses (especially in the introduction sections) still remains vastly under-examined, which is probably caused by the difficulties involved in making a tradeoff between the complex, cognitively demanding task to manually annotate interpersonal language resources (Fuoli 2018) and PhD theses’ sheer sizes (Thompson 2013). Therefore, this lack of attention highlights the value of probing into PhD theses to explore how successful writers take an appropriate stance towards ENs of thesis introductions while establishing credibility and an alignment with the academic community.

2.2 *Negation within the appraisal framework*

To date, research on negation has been extremely extensive in the area of pragmatics, with the majority focusing on semantic ambiguity of natural language negation (Pitts 2011), metalinguistic negation (Davis 2011), the activation of presuppositions (Seuren 2000), and so on. Their findings have cumulatively demonstrated that negation plays a crucial role in constructing, fabricating, and manoeuvring natural language from contextual, textual, ideational, and interpersonal perspectives (Jordan 1998, Pagano 2002). However, despite the wide-ranging literature with respect to negation within pragmatics, the pragmatic realization of negation as a whole is in essence one phenomenon of negation. In the field of SFL (Halliday 1994), by comparison, *negation* has not yet been fully explored, especially concerning the discourse semantic functions it performs (Don 2017). Therefore, in order to fill the gap, *negation* in the present study is examined in light of Martin and White’s (2005) *appraisal* system, which was developed within SFL and has evolved into a systematic extension of the interpersonal meta-function (Wang and Guan 2013).

It is advantageous to look into *negation* within the *appraisal* system because the theoretical framework is “the most systematic analysing tool” (p. 174) laying out a comprehensive typology for exploring interpersonal language resources (Hyland 2005a). Interpersonal resources that were separately scrutinized,

such as intensity (Labov 1984), hedging (Hyland 1998), affect (Ochs and Schieffelin 1989), and evidentiality (Chafe 1986), have all been integrated into Martin and White’s (2005) *appraisal* framework (Xie 2016). Investigating *negation* within a comprehensive framework is significant since the scope of *negation* is not confined to the segmental or categorical level. Instead, the potential of *negation* is achieved through interpersonal meanings “accumulating, reinforcing, or resonating with each other” (Hood 2006, 38) across clausal and sentential boundaries (Lemke 1992, 1998, Martin and Rose 2003). The view is further supported by Chang and Schleppegrell (2011) who found that experienced writers adopt more complicated, diversified interpersonal devices that interact with one another to collaboratively help justify authorial propositions as text unfolds. Drawing on the *appraisal* system can not only probe into the potential of *negation* at the discourse-semantic linguistic stratum but also capture the whole picture of how *negation* is articulated alongside other relevant *appraisal* features to co-construct interpersonal stances. As argued by Thompson and Ye (1991), interpersonal stances are better to be deemed operating at the discourse-semantic level of texts instead of at the grammatical or lexico-grammatical level of segments.

Within the *appraisal* system, *negation* is defined as a dialogic contraction resource for introducing an alternative position into dialogue so as to deny or to reject it (Martin and White 2005). In the area of SFL, *negation* in most cases has been addressed as one of the several interpersonal language features within the *engagement/appraisal* system, targeted at inspecting the realization of rhetorical moves and/or effects in academic discourse (e.g. Loghmani et al. 2020, Xu and Nesi 2019). For example, Xu and Nesi (2019) identified a diverse range of high-frequency combinations of *negation* and other *engagement* devices (e.g. *counter* + *negation*) adopted by Applied Linguistics writers to engage with their discourse community. Their findings serve as evidence to suggest that *negation* may co-occur with *engagement* resources to strategically introduce writers’ debatable opposing propositions. According to Loghmani et al. (2020), *negation* as the third most frequent *engagement* features in the discussion sections of PhD theses tends to take the form of correlative conjunction “neither X nor Y.” As such, *negation* functions to introduce and more importantly contradict the dialogic alternatives (i.e. X and Y) that might be ignored or unexpected by the putative readers. Taken as whole, these studies have highlighted the crucial roles of *negation* in problematizing arguments, introducing writers’ debatable views, and negotiating the potential challenges from readers.

Nevertheless, by comparison, only a tiny minority of studies in SFL have gone so far as to examine the taxonomy of *negation* and investigate how each category functions to convey an appropriate interpersonal stance (Don 2017, Webber 2014). In this line of research, Webber (2014) classified the functions of *negation* into making distinctions, correcting assumptions, simply using formulaic structures, and expressing dissatisfaction, disagreement, cautious stance, unfulfilled expectations, and wholehearted agreement. Webber’s (2014) study demonstrated the roles of *negation* in forestalling possible misunderstanding/criticism, distinguishing authorial view, and clarifying authorial stance on controversial issues. Likewise, Don (2017) pinpointed three main types of *negation* (i.e. unfulfilled expectations, mistaken idea, and disambiguation) based upon their functions and suggested that each category performs to develop a distinctive evaluative stance in written academic discourse.

The abovementioned research has undoubtedly thrown light on the value of investigating the categories of *negation* from the perspective of SFL. Nevertheless, generally speaking, *negation* in SFL has scarcely been addressed as a focal point of study. Rather, it has been discussed, by and large, only as a spin-off to depict upper-layer interpersonal language resources (e.g. *engagement/appraisal* features). In addition, as proved by Webber (2014), there are still certain amounts of unsolved overlapping issues in the existing categories of *negation*.

To address the abovementioned research gaps, this study investigated the use of *negation* in ENs of PhD thesis introductions. The issues were investigated through the linguistic lens of the CARS model (Swales 1990) and the *appraisal* system (Martin and White 2005), while at the same time incorporating corpus-based discourse analysis (Flowerdew 2012) with the purpose of addressing the following two research questions.

- (1) What features of *negation* are displayed in ENs of PhD thesis introductions?
- (2) How do thesis writers use combinations of *negation* alongside other relevant *appraisal* devices to represent claims while rhetorically constructing research gaps?

Table 1: Information about the selected PhD theses

Field of research	School (number of theses)
Engineering	School of Mechanical and Mining Engineering (11)
Medical and Health Sciences	School of Civil Engineering (13) School of Pharmacy (6)
Mathematical Sciences	School of Mathematics and Physics (19)
Physical Sciences	
Chemical Sciences	School of Chemistry and Molecular Biosciences (5)
Biological Sciences	School of Biological Sciences (6)
Education	School of Education (21)
Economics	School of Economics (9)
Philosophy and Religious Studies	School of Historical and Philosophical Inquiry (16)
History and Archaeology	School of Communication and Arts (8)
Studies in Creative Arts and Writing	School of Music (6)

3 Data and methods

3.1 Corpus data

To address the research questions, a total of 120 PhD theses were collected using the University of Queensland (UQ) eSpace advanced search engine. UQ eSpace is the intuitional repository for UQ research publications, encompassing theses written by Higher Degree by Research (HDR) students. The university resource was selected because of the unified taxonomy of research fields as well as the practicality of obtaining the full texts of PhD theses on a large scale. Detailed information about the enrolled PhD theses are shown in Table 1.

The enrolled theses all met the criteria that (a) they were completed by PhD candidates enrolled in UQ, (b) they were submitted for the degree of Doctor of Philosophy at UQ from 2013 to 2020, (c) in each thesis, there was a standalone “introduction” in which a Move 2 section could be identified.⁴ The sampling and representativeness of corpus construction sought to address this study’s specific research questions, while the criteria were to ensure comparability across texts. The selected PhD theses were then converted from .pdf format to .txt file using AntFileConverter (Anthony 2017).

For a theoretically grounded scrutiny of thesis discourse, the author employed the qualitative top-down corpus-based approach (Biber et al. 2007) to inductively examine the “introduction” section, classify and segment the three-move schema, and manually extract the targeted move. The approach was adopted due to its functional-semantic focus, which stresses the significance of cognitive judgment for identifying the rhetorical purposes of moves (Cotos et al. 2015, Kwan 2006). As such, Move 2 sections of PhD thesis introductions were stored in 120 plain texts. The corpus was cleaned of tables, figures, formulas, and footnotes that arose in the target introduction section. The whole corpus totalled 23,477 words, with an average length of approximately 196 words per text.

3.2 Identification of *appraisal* devices and taxonomy of *negation* resources

3.2.1 *Appraisal* resources

In this study, *negation* was analysed drawing on Martin and White’s (2005) *appraisal* framework, which is made up of three main domains: *attitude*, *graduation*, and *engagement*. Due to the extensive property of the

⁴ In this study, Move 2 sections were identified following the CARS framework proposed by Paltridge and Starfield (2020) considering the variation between thesis introductions and research article introductions. The framework was devised based on the original CARS model (Swales 1990) and designed specifically for revealing/analysing the typical moves in thesis introductions.

appraisal system (Bednarek 2008, 2009, Martin and White 2005), researchers adopted the approach proposed by Lam and Crosthwaite (2018) to make a compromise between the corpus-based manual annotation and the comprehensiveness of the *appraisal* system. The framework used in the study is shown in Figure 1.

The *attitude* domain deals with linguistic resources for construing emotional reactions. It is concerned with *affect* (expressing emotions), *judgement* (judging behaviour), and *appreciation* (evaluating entities). The emotions concerning *affect* are further categorized into *dis/satisfaction* (ennui/satisfaction), *un/happiness* (sadness/happiness), *dis/inclination* (fear/desire), and *in/security* (anxiety/confidence). *Judgement* deals with behaviour towards *social esteem* consisting of *capacity* (capable), *normality* (usual), *tenacity* (resolute), and *social sanction* is made up of *propriety* (ethical) and *veracity* (truthful). *Appreciation* is divided into *composition* (balanced, easy to follow), *reaction* (attention-catching), and *valuation* (worthwhile). *Attitude* resources, featuring *positive*, *negative*, *neutral/ambiguous* polarities, can be either implicitly *invoked* cued by combined resources in the co-text or explicitly *inscribed* via lexico-grammatical constructs.

The *graduation* domain is concerned with linguistic resources which vary the strength of evaluation in respect of *focus* and *force*. *Focus* is undertaken to *soften* or *sharpen* the degree of unscalable meaning. In contrast, *force* functions to *down-scale* or *up-scale* the degree of intensification operated over processes, qualities, and modalities, which are commonly regarded as scalable from an experimental perspective.

The *engagement* domain deals with intersubjective positioning resources, differentiating two main categories: *heteroglossic* (authorial voicing engaged with alternative positions) and *monoglossic* (bare assertion). *Heteroglossic* resources are classified into *expand* and *contract*. *Expand* accedes to alternative positions through unfolding dialogic potential by utilizing *attribute* or *entertain*. To be more specific about the *attribute* resources, authors may *distance* themselves from alternative views via reporting verbs, while *acknowledge* happens when authors recognize other sources explicitly. In comparison, authors may draw on modal words and phrases to generate space for diverse dialogic possibilities where such a technique is noted as *entertain*. To come to *contract* devices, *proclaim* is used for authorial intervention when dialogic alternatives are challenged, confronted, or otherwise excluded. *Proclaim* is further categorized into *pronounce*, *justify*, *endorse*, and *concur*. *Pronounce* refers to explicit authorial proposition, while authors may use conjunctions (e.g. “because”) with the purpose of giving reasons to *justify* a proposition. *Endorse* involves those authorial expressions that construe external sources as warrantable. *Concur* is concerned with locutions to openly announce alignment with a proposition realized through *concede* or *affirm*. *Disclaim* serves to narrow the dialogic space for alternative views to be considered, and *disclaim* markers incorporate *counter* and *negation*. *Counter* refers to the use of conjunctions (e.g. “although,” “but”) when authors supplant and thereby oppose to alternative positions with counterarguments. *Negation* is adopted to show authorial disalignment with alternative views.

3.2.2 Taxonomy of *negation* resources

In this study, *negation* is categorized based on Webber’s (2014) taxonomy, with the overlapping headings combined and renamed in order to refrain from muddling up with other *appraisal* devices as well as adjusting to the present research. The taxonomy adopted in this study is presented in detail below.⁵

(1) *Disalignment*: Authors use “no,” “not” to express explicit denial of the corresponding affirmation.⁶

Disalignment plays a role in enhancing authoritativeness of the authorial voice by eliminating the discursive space for alternative propositions, for instance, findings in the area are not [*negation: disalignment*] generalizable (Geng and Wharton 2019).

⁵ It should be specially pointed out that the core subject of this research focuses on the use of *negation*. In other words, following the definition of *negation* within SFL (Martin and White 2005), we did not count quasi-negatives, quantifiers, contrastive statements, or the negative polarity as *negation*.

⁶ According to Horn (2001), *negation* (e.g. B is not A) presupposes a corresponding affirmation (e.g. B is A), and “every *negation* (or *denial*) has a corresponding affirmation” (p. 48).

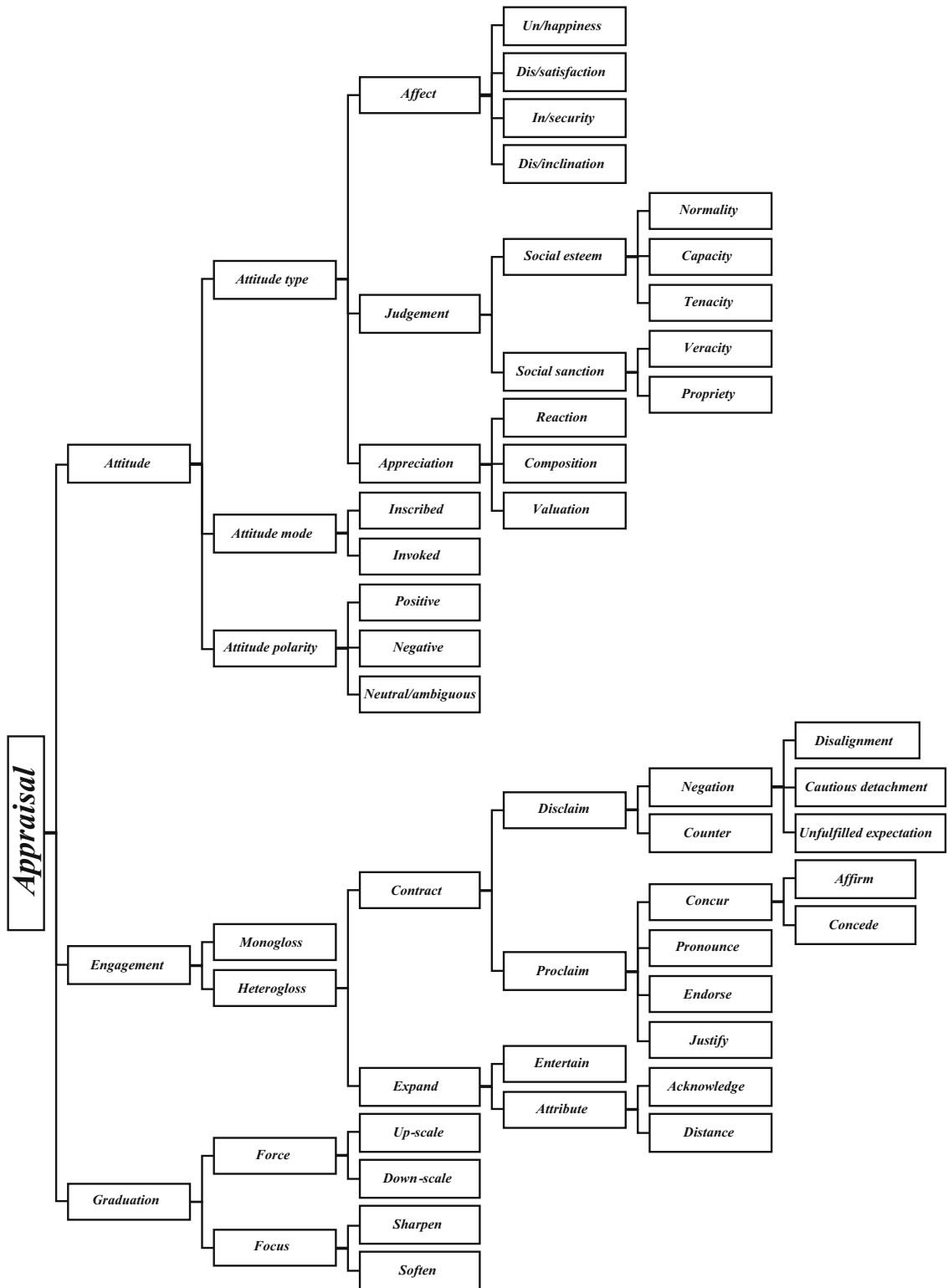


Figure 1: The appraisal framework.

- (2) *Cautious detachment*: Authors indicate careful detachment by adopting hedging strategies such as “perhaps,” “might,” where the hedging strategies function to limit the scope of propositional content or to reduce epistemic commitment. As such, *cautious detachment* subtly opens up discursive space for alternative propositions by projecting cautiousness or equanimity while mitigating the degree of denial.
- (3) *Unfulfilled expectation*: The device is adopted to create space for dialogic potential by conveying authors’ dissatisfaction instead of outright criticism (Pagano 2002, Webber 2014). *Unfulfilled expectation* is realized through emphatic discontinuous phrases which draw on adversative conjunctions as contextual signals, such as “I do not deny that... but...”, “not just... but...”, “we cannot be satisfied with... but...”.

3.3 Corpus annotation

Based on the abovementioned *appraisal* system,⁷ the corpus was manually annotated using UAM (Universidad Autónoma de Madrid) CorpusTool version 3.3 (O’Donnell 2019). The UAM CorpusTool is an open-source software for text annotation at multiple layers. Accordingly, the tool is particularly suitable for annotating the oft-times overlapping subtypes of the *appraisal* framework.

Since different scholars might vary in their interpretations of the same *appraisal* item, one concern with regard to annotating *appraisal* resources is the potential subjectivity involved in the annotation process (Artstein and Poesio 2008, Coffin and O’Halloran 2006). To minimize any latent subjective judgement, the present study adopted Fuoli’s (2018) step-wise annotating approach to first randomly choose 12 samples. In other words, a total of 244 annotated segments were covered in the sample corpus which accounted for 10% of the data approximately. Then, the selected samples were annotated by the authors and checked for accuracy by two raters to ensure reliability. The raters were both native English speakers who held a PhD degree in the field of SFL and had over 5-year teaching experience. The raters independently inspected each coded chunk and came to a decision on whether they agreed (“yes”) or disagreed (“no”). The Intraclass Correlation Coefficient for the analysis (two-way random, general consistency, $k = 2$) was 0.797, which was an “excellent” standard of agreement (Cicchetti 1994). After ensuring that no inconsistency existed in coding the sample texts, the rest of the corpus was annotated.

4 Results

4.1 Overview of *negation* resources

On the whole, there are a total of 180 units of *negation* ($n = 180$, normalized frequency⁸ = 8.28), accounting for around 14.52% of the *engagement* resources ($n = 1,240$, normalized frequency = 45.25) and 7.24% of the *appraisal* resources ($n = 2,487$, normalized frequency = 90.75).⁹

As for the four subtypes of *negation*, *disalignment* is the most frequent one ($n = 163$, normalized frequency = 7.49), making up 90.56% of the *negation* resources. The frequencies of *unfulfilled expectation*

⁷ The authors followed the *appraisal* system (as shown in Figure 1) to annotate all the instances of *negation* alongside other *engagement*, *attitude*, and *graduation* resources.

⁸ The raw statistics went with a conversion of normalized frequency (i.e. instances per 1,000 words) counted by the UAM CorpusTool.

⁹ Thesis writers might also use *positive/negative* polarities (together with *negation*) to independently/co-construct research gaps. As witnessed in our corpus, there are 303 units of the *positive* polarity (normalized frequency = 11.46), 222 units of the *negative* polarity (normalized frequency = 8.40), and 35 units of the *neutral/ambiguous* polarity (normalized frequency = 1.32).

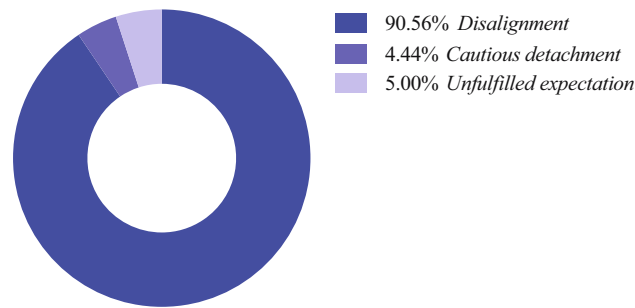


Figure 2: Subtypes of *negation*.

Table 2: Items of *disalignment*

Wording	Frequency	Proportion (%)
not	114	69.94
no	39	23.93
cannot	3	1.84
nor	2	1.23
by no means	1	0.61
none	1	0.61
didn't	1	0.61
doesn't	1	0.61
neither	1	0.61

($n = 9$, normalized frequency = 0.41) and *cautious detachment* ($n = 8$, normalized frequency = 0.37) are similar, and they account for 5.00% and 4.44% of the *negation* resources, respectively (Figure 2).

4.2 Subtypes of *negation*

4.2.1 *Disalignment*

Table 2 shows the items of *disalignment* and their frequencies. The item “not” and “no” are the most frequent indicators of *disalignment*, making up 69.94% and 23.93% of *disalignment* resources, respectively. By comparison, “cannot” and “nor” are relatively less commonly witnessed though they are still more frequent than “by no means,” “none,” “didn’t,” “doesn’t,” and “neither,” which only appear once in our corpus.

Table 3 summarizes the high-frequency patterns of *disalignment*. It can be seen from Table 3 that *disalignment* often co-occurs with *counter*. As shown in Excerpt 1, the connective “however” supplies the foreshadowed *counter*, preceding the *disalignment* indicator “no.” In this case, the co-occurrence of *counter* and *disalignment* presents the thesis writer as stepping back from an established but contrary value position, thereby signalling that the writer’s own position is somehow counter-expectational. As such, the writer can more broadly confront that dialogic alternative by expressing the authorial position on the research gap.

(1) (*counter*) However, there is (*disalignment*) no meta-analysis investigating the development of diabetes associated with anxiety symptoms and/or disorders.

Table 3: Patterns of *disalignment*

Pattern	Frequency
<i>counter</i> + <i>disalignment</i> (+ <i>counter</i>)	79
(<i>attitude</i> +) <i>disalignment</i> + <i>attitude</i>	70
<i>up-scale/down-scale</i> + <i>disalignment</i> (+ <i>up-scale/down-scale</i>)	60
<i>justify</i> + <i>disalignment</i> (+ <i>justify</i>)	24
<i>entertain</i> + <i>disalignment</i> (+ <i>entertain</i>)	16
<i>pronounce</i> + <i>disalignment</i> (+ <i>pronounce</i>)	11
independent use of <i>disalignment</i>	21

Attitude devices including *affect* (*in/security, dis/inclination*), *judgement* (*normality, capacity, tenacity, propriety*), and *appreciation* (*reaction, composition, valuation*) are likely to co-occur with *disalignment* resources, and they tend to be explicitly conveyed in a positive mood. *Disalignment* indicator “not”/“no” may either follow or precede *attitude* resources, such as the *tenacity* item “systematic,” which is shown in Excerpt 2 and Excerpt 3, respectively. In the former condition, *tenacity* is used to emphasize PhD candidate’s efforts on searching literature so as to justify the reliability of the identified research gap. In the latter case, *tenacity* functions to construct the niche by conveying the writer’s position on the lack of well-organized, thorough research in a certain filed.

-
- (2) A (*tenacity_inscribed_positive*) systematic search for studies of principals’ thinking about assessment shows that principals’ perceptions of the contexts of assessment in their schools have (*disalignment*) not received (*up-scale*) much attention from researchers.
- (3) To date there has been (*disalignment*) no (*tenacity_inscribed_positive*) systematic attempt to examine this type of Philippic material as a whole in its own right.
-

In most cases, *attitude* devices tend to follow *disalignment*, for example, thesis writers would draw on a combination of *counter*, *disalignment*, and *tenacity* to jointly establish a niche (see Excerpts 4–5). The writers use *counter* and *disalignment* to refute the positive mood established by *tenacity* items (“comprehensive” and “established”), signalling authorial emphasis on the lack of dependable work.

-
- (4) (*up-scale*) Much of the existing literature in both fields is pertinent to the study of these myths, (*counter*) but there is (*disalignment*) no (*tenacity_inscribed_positive*) comprehensive reference work in this area.
- (5) Geothermal, solar thermal, and waste-heat are prime candidates to make use of ORCs, (*counter*) but there is (*disalignment*) no (*up-scale*) fully (*tenacity_inscribed_positive*) established base of knowledge available to the scientific community on the performance of these types of cycles.
-

At the same time, however, writers might also construct a research gap drawing on the *negative* polarity only. As shown in Excerpt 6, instead of combining *negation* and *positive attitude* resources, the thesis writer uses an independent *negative composition* device “unclear” to argue that the existing mechanism is still inexact and requires further investigation.

-
- (6) The mechanism of transportation of haeme iron remains (*composition_inscribed_negative*) unclear and is different to that of non-haeme iron.
-

In addition, in Excerpts 7–8, the thesis writers establish a niche by using *disalignment* to criticize previous studies with regard to their *capacity* (“successful”) and *reaction* (“interesting”). As shown in Excerpt 8, *attitude* resources may even co-occur with each other while establishing a niche.

-
- (7) (*counter*) While studies have evaluated nest management methods for (*up-scale*) a wide range of turtle nest predators, (*disalignment*) no studies have developed a (*capacity_inscribed_positive*) successful management strategy against nest predation by monitor lizards.
- (8) These approaches are (*up-scale*) often considered questionable (*justify*) because it is (*disalignment*) not (*composition_inscribed_positive*) clear that (*reaction_inscribed_positive*) interesting, strongly coupled systems correspond to simplifying limits of the gravitational theory.
-

Disalignment markers would occur close to *up-scale* (or sometimes *down-scale*) items, such as “fully” (Excerpts 5 and 10), “a wide range of” (Excerpt 7), “often” (Excerpt 8), and “many” (Excerpt 9). Generally speaking, *up-scale* devices perform two main functions. As shown in Excerpt 9, *up-scale* indicator “many” functions to emphasize the large amounts of previous research, counterpointing itself against the gap expressed via *disalignment* device “not.” In comparison, in Excerpt 10, the *up-scale* indicator “fully” is fused with a meaning which by and large serves a semantic function while stressing the unfulfilled research need.

-
- (9) (*counter*) While there are (*up-scale*) many metrics that can be used during the generation of a model structure from X-ray data to increase the reliability of the structure, such as Ramachandran plots, clash scores, and R-values, these do (*disalignment*) not provide information on the biological significance of an X-ray crystal structure.
- (10) What such studies have (*disalignment*) not (*up-scale*) fully investigated (*counter*) yet in the area of Russian sacred music in the late nineteenth century is the degree of Westernisation of the repertoire and the inner conflicts (whether theoretical or ideological) that led to the inconsistencies outlined above.
-

It is also common for *disalignment* to occur together with *justify*. Thesis writers may justify the reason in a straightforward way after putting forward a research gap (see Excerpts 8 and 11).

-
- (11) It is also (*disalignment*) not (*valuation_inscribed_positive*) desirable to throttle the engine in an accelerating vehicle (*justify*) as maximum engine performance is desired.
-

In addition, thesis writers may draw on *entertain* devices to indicate a careful authorial detachment. As shown in Excerpt 12, writers would set out a reason ahead of establishing a niche. Accordingly, such an evidence-based postulation can open up the dialogic space for alternative positions, leading to the effect of lowering the interpersonal cost for any who would advance such an alternative.

-
- (12) (*justify*) Since the Canadian Government’s (2004) inquiry (*entertain*) indicated that there is (*disalignment*) no (*up-scale*) significant gender difference with respect to intelligence and general abilities, there is (*disalignment*) no substance to support the idea that boys were “missing out.”
-

Thesis writers might also adopt *pronounce* strategies when justifying the legitimacy of the research gap. As exemplified by Excerpt 13, the *pronounce* items constitute an overt authorial intervention with the purpose of asserting or insisting on the warrantability and value of the proposition related to the justification.

Table 4: Items of *cautious detachment*

Wording	Frequency	Proportion (%)
not	5	62.50
whether or not	2	25.00
no	1	12.50

(13) This contention needs to be examined (*justify*) because it (*pronounce*) should (*disalignment*) not be assumed that, when “national unity” is promoted by the ruling elites by disseminating messages through the media, that their interests and those of the people are (*pronounce*) necessarily the same.

It is worth bearing in mind that *disalignment* is also likely to be used independently. As the commonly adopted subtype of *negation*, *disalignment* usually functions to establish a niche by expressing explicit authorial denial of the corresponding affirmation. Inferred from Excerpts 14 and 15, the independent use of *disalignment* explicitly points out the gap in previous research by declaring authorial detachment with particular value positions. In fact, such use of *disalignment* also signals the strength of authorial view without yielding any possibility of dialogic expansion for the thesis writers’ arguments.

-
- (14) (*disalignment*) No longitudinal or case–control studies have examined the association between modifiable mental health conditions (depression and anxiety) and diabetes in women in Malaysia and the current study examined this relationship.
- (15) This firm-level dataset is a balanced panel with one output and three inputs, which has (*disalignment*) not been used in the literature.
-

4.2.2 *Cautious detachment*

Table 4 presents the items of *cautious detachment*, which are “not,” “whether or not,” and “no.” “Not” is the most frequent indicator of *cautious detachment*, accounting for 62.50% of *cautious detachment* devices. The indicators “whether or not” and “no” are relatively less frequent, making up 25.00% and 12.50% of *cautious detachment* resources, respectively.

As shown in Table 5, *cautious detachment* frequently goes together with *counter* and *entertain* (see Excerpt 16). It is common for thesis writers to first state previous researchers’ attempt to fill a gap and then criticize the solution by pointing out its defects using *counter* and *cautious detachment*. At the same time, thesis writers as apprentice scholars tend to use *entertain* to modestly make dialogic space for other possibilities/positions.

(16) Decomposing the crash count into its constituent components and based on multiple sources of risk (*entertain*) would (*counter*) still (*cautious detachment*) not take into account the societal impact of crashes.

Thesis writers may also use the *up-scale* device to describe an increase in the quantity of previous studies and then *counter* the position by pointing out research gaps. It should be noted that writers tend to adopt *entertain* strategies to cautiously detach themselves instead of plainly pinpointing their counter-positions (see Excerpt 17).

Table 5: Patterns of *cautious detachment*

Pattern	Frequency
<i>counter</i> + <i>cautious detachment</i> (+ <i>counter</i>)	6
<i>entertain</i> + <i>cautious detachment</i> (+ <i>entertain</i>)	5
<i>up-scale</i> + <i>cautious detachment</i> (+ <i>up-scale</i>)	4
(<i>pronounce</i> +) <i>cautious detachment</i> + <i>pronounce</i>	3
(<i>appreciation</i> +) <i>cautious detachment</i> (+ <i>appreciation</i>)	2

(17) (*counter*) Although research on professional development interventions that support an across the curriculum approach to numeracy is (*up-scale*) growing, research does (*cautious detachment*) not (*entertain*) seem to have focused on how teachers interpret and translate their experiences from such interventions into their classroom practices.

Some writers adopt *pronounce* together with *cautious detachment*, where the *pronounce* resource functions to convey an authorial emphasis on the necessity of conducting research in a less-studied area (Excerpt 18).

(18) Therefore, historical analysis (*pronounce*) should consider the ancient evidence first and foremost, with the scholar's approach judged on its own merits (*cautious detachment*) whether or not it employs theories from sociology, anthropology, or elsewhere.

In addition, *cautious detachment* might also co-occur with *appreciation* devices (e.g. *valuation*, *composition*), which function to realize authorial evaluations of objects, circumstances, natural phenomena, and so on. As noted in Excerpt 19, the use of *composition* is to evaluate the complexity of the targeted context so as to explain why the research gap exists.

(19) (*counter*) However, the application of “standardized press freedom metrics” (*entertain*) might (*cautious detachment*) not capture cultural and contextual complexities, particularly when measuring press freedom in (*composition_inscribed_negative*) complex environments like Pakistan.

4.2.3 Unfulfilled expectation

As shown in Table 6, indicators of *unfulfilled expectation* include “not” and “no.” Thereinto, “not” is more frequent, accounting for 77.78% of *unfulfilled expectation* resources, whereas “no” makes up only 22.22% of *unfulfilled expectation* devices.

Table 7 summarizes high-frequency patterns of *unfulfilled expectation*. *Unfulfilled expectation* commonly goes together with *counter* and/or *down-scale/up-scale* (see Excerpts 20–21). As shown in Excerpt 20, the thesis writer adopts *unfulfilled expectation* and *down-scale* to establish a niche, which is followed by a comparison of what has been done in the relevant field, aiming to implicitly indicate the value of

Table 6: Items of *unfulfilled expectation*

Wording	Frequency	Proportion (%)
not	7	77.78
no	2	22.22

Table 7: Patterns of *unfulfilled expectation*

Pattern	Frequency
(<i>counter+</i>) <i>unfulfilled expectation</i> + <i>counter</i>	9
(<i>up-scale+</i>) <i>unfulfilled expectation</i> + <i>down-scale/up-scale</i>	8
<i>unfulfilled expectation</i> + <i>attitude</i>	3
<i>unfulfilled expectation</i> + <i>entertain</i>	2

occupying the niche. Similarly, Excerpt 21 draws on *unfulfilled expectation* and *down-scale/counter* to not only pinpoint the research gap but more importantly throw light on its implications for empirical work.

-
- (20) The author did (*unfulfilled expectation*) not identify (*down-scale*) any study using the CPM to investigate the extrusion of cells, (*counter*) but there are studies that concentrate on the invasion of cells into cell clusters or a monolayer.
- (21) The relationship between circumstances and effort is (*unfulfilled expectation*) not (*down-scale/counter*) just a conceptual issue. It has implication for empirical work.
-

As noted in Table 7, *unfulfilled expectation* may also go together with *attitude* resources. For example, in Excerpt 22 the writer adopts *unfulfilled expectation* alongside *inscribed negative tenacity* to co-construct gaps in previous research. This is followed by a contrast to a relevant but over-studied area, aiming to emphasize the importance of filling the gaps.

-
- (22) The landscape of Adventist urban mission studies in general has (*unfulfilled expectation*) not been crowded, and Adventist urban mission studies regarding the United States in particular are also (*tenacity_inscribed_negative*) limited, (*counter*) although (*up-scale*) extensive work has been done on John Harvey Kellogg and the Chicago Medical Mission.
-

In addition, *unfulfilled expectation* would also go together with *entertain*. In Excerpt 23, the thesis writer first draws on *unfulfilled expectation* to establish a niche and then slightly *counters* the gap by using *entertain* to allow for possibilities of dialogistical alternatives.

-
- (23) Dewey left behind him (*unfulfilled expectation*) no samples of philosophical curricula, (*counter*) but he did bequeath to us something (*entertain*) perhaps just as (*valuation_inscribed_positive*) valuable.
-

5 Discussion

This study has explored the use of *negation* in Move 2 of 120 PhD theses' introduction, addressing subtypes of *negation* drawing on Martin and White's (2005) *appraisal* framework. Three sub-categories of *negation*, i.e. *disalignment*, *cautious detachment*, and *unfulfilled expectation*, were depicted both quantitatively based on statistical results and qualitatively via a corpus-based top-down approach. According to our findings, at the categorical level, *disalignment* is the dominant feature, while *unfulfilled expectation* and *cautious detachment* account for the second and third largest proportion. At the lexical levels, “not” and “no” are commonly used as indicators of all subtypes of *negation*. In addition, the results revealed intriguing co-occurrences of *negation* sub-categories alongside other relevant *appraisal* resources, which could be accounted for by the nature of *negation* as well as the conventions of thesis writing.

It has been found that thesis writers commonly employ *negation* resources, especially *disalignment* devices. This is perhaps not surprising due to the essence of Move 2 of PhD thesis introductions, where writers have to position themselves in the marketplace of previous ideas, intending to “sell” their own viewpoint by identifying a specific gap which the new “product” can fill (Paltridge and Starfield 2020, Swales and Feak 2000). As such, Move 2 is argumentative in nature and functions as a mini-critique (Swales and Feak 2002). According to Atkinson and Curtis (1998), the language of “gap statements” is typically evaluative in a negative way. This is further supported by Martin and White’s (2005) finding that the frequency of *negation* is much higher in argumentative and editorial pieces of writing than in news reporting. The argumentation in Move 2 of thesis introductions involves both challenging (and even rejecting) alternative positions and establishing the writer’s own standpoint. Therefore, such argumentation would inevitably involve a great deal of *negation* resources which are denoted as “features of persuasive writing where contesting positions need to be addressed and set aside” (Martin and Rose 2003, 49).

The findings also show that “not” and “no” are the most regular *negation* indicators in the patterns. Based on the empirical findings, it can be concluded that these two triggers have more potential in introducing dialogic space and negating alternative attitudes and voices in written academic communication. More specifically, the results show that “not” as an indicator of *disalignment*, *cautious detachment*, and *unfulfilled expectation* is most typically adopted. This is in line with previous corpus-based findings of *negation* patterns in which not-*negations* account for a large proportion within more formal written academic genres (e.g. Biber et al. 1998, Tottie 1991). In addition, our results show that “no” as a *negation* (esp. *disalignment*) trigger is also highly preferred. This is probably due to the fact that no-*negations* can be more emphatic than not-*negations* while expressing judgements (Biber et al. 1998). According to Cheshire (1999), the emphasis is due to the nature of no-*negations* which represents absolutes at the end of implicatures of usuality and quantity. As a consequence, in our corpora, no-*negations* create an “overstatement” (Cheshire 1999, 39) and persuade the audience to take on the authorial scope. As argued by Cheshire (1999), both not-*negations* and no-*negations* play the role of effective intensifying devices and are vital for securing interpersonal involvement in written communication. By comparison, writers may also convey research gaps by choosing the *negative attitude* (e.g. “unconvincing”) instead of the combination of *negation* and *positive attitude* resources (e.g. “not persuasive”). Adopting such “strongly negative” (Swales and Feak 2002, 351) adjectives may create an intensified authorial stance, generate certain proposition as a fact (as opposed to an assumption or recommendation, see Martin and White (2005)), and thus reduce the discursive space for alternative positions.

6 Closing comments

To the best of our knowledge, this is the first study that has drawn on Martin and White’s (2005) *appraisal* framework to explore qualities of *negation* in PhD theses. By probing into the taxonomy of *negation* in written academic discourse as well as investigating the co-occurrences of *negation* alongside other *appraisal* resources related to *negation*, the study has demonstrated intriguing rhetorical potentials of *negation* resources and has also offered new insights into the ways *appraisal* resources are co-articulated in niche establishment of PhD theses. A scrutiny of the taxonomy of *negation* is helpful for further enriching the *appraisal* framework, especially complementing the *engagement* system. The corpus-informed results have shed light on the nature and practice of PhD theses writing that educators may take into account when guiding students into an awareness of academic writing conventions during EAP instruction. As such, the findings of the present study are expected to better inform thesis writing practice and provide implications for developing EAP courses for more explicit instruction in the following ways.

- First, considering thesis writers inevitably employ a fair number of interpersonal language resources and in particular make use of some dialogic contraction strategies while creating a research space in the introduction sections of PhD theses (Loghmani et al. 2020, Swales and Feak 2002), findings of this study will probably be of interest to novice writers and writing tutors. Academic writing educators might find it

helpful to draw the attention of novice researchers to the various uses of dialogic contraction evaluative devices.

- Second, by exploring the use of *negation* in PhD theses, findings of this study have shed light on how successful PhD candidates use *negation* strategies to position themselves and engage with academic communities. Therefore, the findings might also help to raise students’ awareness of the complexity of *negation* strategy choices which are open to academic writers, and the possible genre-specific reasons for the strategies they select.
- Third, the qualitative top-down corpus-based approach, by which *negation* was explored qualitatively across clause boundaries, has allowed us to identify co-occurring patterns within the sentential level. The analysis revealed a tendency for thesis writers to combine *negation* and other *appraisal* resources. Inspired by the highly beneficial workshops provided by Geng and Wharton (2019) based on their corpus-based analyses of PhD thesis discussion sections, findings of the present study can be put into practice by offering writing sessions to the Higher Degree by Research students who are working on their dissertations. Students who are offered the chance to interact with these findings and interpretations during the sessions will be able to critically reflect on the possible rhetorical consequences of various evaluative language choices, and to eventually draw conclusions relevant to their own academic writing.

Nevertheless, considering the present study represents only a preliminary attempt to study *negation* drawing on the *appraisal* framework, there is still potential for investigating the use of *negation* in broader academic genres (e.g. research articles, book reviews) from a pragmatic perspective. Besides, the validity and reliability of the present findings could be improved in a number of ways. This is due to the fact that an expanded sample would normally achieve more valid results, though a sample of 30 texts (per group) has already met the minimum requirement for sample size (Roever and Phakiti 2017). In addition, exploring the second move of PhD theses could be regarded as isolated to some extent. It would surely be appealing to track the step-wise development of *negation* in the full introduction sections of PhD theses drawing on metadiscursive analysis and move analysis which are commonly used in the area of EAP (e.g. Adel and Erman 2012, Tankó 2017).

Furthermore, previous literature has also suggested that the L1 background and the local institutional culture might affect writers’ employment of interpersonal language strategies. For example, Dahl (2004) found that patterning of textual metadiscourse is impacted by both disciplinary culture and L1 background, though disciplinary culture can transcend L1 background in the discipline with a more homogeneous and stable knowledge base (e.g. medicine). In line with Hu and Liu (2018), the present study did not use language background as a criterion for three reasons: (a) such information was rather complicated especially in the English as a Second Language (ESL) tertiary educational context, (b) the information was not available publicly, and (c) the selected PhD theses in our corpora showed no apparent language difficulties and their authors were all awarded a PhD degree at the University of Queensland. Besides, considering the influence of local institutional context on writers’ language choices (Li and Wharton 2012), the present study had intentionally selected theses from a single institution to avoid the potential complication caused by different institutional contexts. Nevertheless, this might in turn affect the generalizability of our findings since they might not be able to be generalized to other institutions.

Given the above implications and limitations, a number of future research possibilities can be suggested. For example, future studies could construct larger corpora and demarcate the development traces of *negation* in the full introduction sections of PhD theses. Researchers might also explore the use of *negation* in other thesis sections (e.g. literature review) and academic genres (e.g. research articles). In addition, it might be interesting to compare *negation* resources in PhD theses written by authors from different L1 backgrounds (e.g. L1 English vs L1 Chinese) or from different institutions (e.g. University of Cambridge vs University of Toronto), in order to explore whether their L1/institutional provenance truly seems to be an influencing factor in the choice of *negation* devices.

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References

- Adel, Annelie and B. Erman. 2012. "Recurrent word combinations in academic writing by native and non-native speakers of English: A lexical bundles approach." *English for Specific Purposes* 31(2), 81–92. doi: 10.1016/j.esp.2011.08.004.
- Allison, D., L. Cooley, J. Lewkowicz, and D. Nunan. 1998. "Dissertation writing in action: The development of a dissertation writing support program for ESL graduate research students." *English for Specific Purposes* 17(2), 199–217. doi: 10.1016/S0889-4906(97)00011-2.
- Anthony, L. 2017. *AntFileConverter (Version 1.2.1) [Computer software]*. Tokyo, Japan: Waseda University. <https://www.laurenceanthony.net/software>.
- Artstein, R. and M. Poesio. 2008. "Inter-coder agreement for computational linguistics." *Computational Linguistics* 34(4), 555–96. doi: 10.1162/coli.07-034-R2.
- Atkinson, D. and A. Curtis. 1998. *A handbook for postgraduate researchers*. Hong Kong: Hong Kong Polytechnic University.
- Bednarek, M. 2008. *Emotion talk across corpora*. London: Palgrave Macmillan. <https://link.springer.com/book/10.1057/9780230285712>.
- Bednarek, M. 2009. "Language patterns and attitude." *Functions of Language* 16(2), 165–92. doi: 10.1075/fo1.16.2.01bed.
- Bhatia, V. K. 2013. *Analysing genre language use in professional settings*. London: Routledge.
- Biber, D., U. Connor and T. Upton. 2007. *Discourse on the move: Using corpus analysis to describe discourse structure*. Amsterdam: John Benjamins.
- Biber, D., S. Conrad, and R. Reppen. 1998. *Corpus linguistics: Investigating language structure and use*. Cambridge: Cambridge University Press.
- Bitchener, J. and H. Basturkmen. 2006. "Perceptions of the difficulties of postgraduate L2 thesis students writing the discussion section." *Journal of English for Academic Purposes* 5, 4–18. doi: 10.1016/j.jeap.2005.10.002.
- Bunton, D. 2002. "Generic moves in PhD theses introductions." In *Academic discourse*, edited by J. Flowerdew, p. 57–75. London: Routledge. <https://www.taylorfrancis.com/books/e/9781315838069/chapters/10.4324/9781315838069-11>.
- Bunton, D. 2005. "The structure of PhD conclusion chapters." *Journal of English for Academic Purposes* 4(3), 207–24. doi: 10.1016/j.jeap.2005.03.004.
- Chafe, W. 1986. "Evidentiality in English conversation and academic writing." In *Evidentiality: The linguistic coding of epistemology*, edited by W. Chafe and J. Nichols, p. 261–72. New Jersey: Ablex.
- Chan, T. 2015. "A corpus-based study of the expression of stance in dissertation acknowledgements." *Journal of English for Academic Purposes* 20, 176–91. doi: 10.1016/j.jeap.2015.09.005.
- Chang, P. and M. Schleppegrell. 2011. "Taking an effective authorial stance in academic writing: Making the linguistic resources explicit for L2 writers in the social sciences." *Journal of English for Academic Purposes* 10(3), 140–51. doi: 10.1016/j.jeap.2011.05.005.
- Cheshire, J. 1999. "English negation from an interactional perspective." In *Negation in the history of English*, edited by I. T. van Oostade, G. Tottie and W. van der Wurff, p. 114–26. Berlin: Mouton de Gruyter.
- Cicchetti, D. V. 1994. "Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology." *Psychological Assessment* 6(4), 284–90. doi: 10.1037/1040-3590.6.4.284.
- Coffin, C. and K. O'Halloran. 2006. "The role of appraisal and corpora in detecting covert evaluation." *Functions of Language* 13, 77–110. doi: 10.1075/fo1.13.1.04cof.
- Cotos, E., S. Huffman, and S. Link. 2015. "Furthering and applying move/step constructs: Technology-driven marshalling of Swalesian genre theory for EAP pedagogy." *Journal of English for Academic Purposes* 19, 52–72. doi: 10.1016/j.jeap.2015.05.004.
- Dahl, T. 2004. "Textual metadiscourse in research articles: A marker of national culture or of academic discipline." *Journal of Pragmatics* 36, 1807–25. doi: 10.1016/j.pragma.2004.05.004.

- Davis, W. A. 2011. “‘Metalinguistic’ negations, denial, and idioms.” *Journal of Pragmatics* 43(10), 2548–77. doi: 10.1016/j.pragma.2011.03.015.
- Don, A. 2017. *Negation as part of the engagement framework: Explorations in the territory Disclaim: deny*. CeSLiC. <http://amsacta.unibo.it/id/eprint/5545>
- Flowerdew, L. 2012. “Corpus-based discourse analysis.” In *The Routledge handbook of discourse analysis*, edited by J. P. Gee and M. Handford, p. 200–14. London: Routledge.
- Fuoli, M. 2018. “A step-wise method for annotating appraisal.” *Functions of Language* 25(2), 229–58. doi: 10.1075/fol.15016.fuo.
- Geng, Y. and Wharton, S. 2016. “Evaluative language in discussion sections of doctoral theses: Similarities and differences between L1 Chinese and L1 English writers.” *Journal of English for Academic Purposes* 22, 80–91. doi: 10.1016/j.jeap.2016.01.001.
- Geng, Y. and Wharton, S. 2019. “How do thesis writers evaluate their own and others’ findings? An appraisal analysis and a pedagogical intervention.” *English for Specific Purposes* 56, 3–17. doi: 10.1016/j.esp.2019.06.002.
- Halliday, M. A. K. 1994. *An introduction to functional grammar* (2nd edn). London: Edward Arnold.
- Holmes, R. 1997. “Genre analysis, and the social sciences: An investigation of the structure of research article discussion sections in three disciplines.” *English for Specific Purposes* 16, 321–37.
- Hood, S. 2006. “The persuasive power of prosodies: Radiating values in academic writing.” *Journal of English for Academic Purposes* 5(1), 37–49. doi: 10.1016/j.jeap.2005.11.001.
- Horn, L. 2001. *A natural history of negation*. Chicago: University of Chicago Press.
- Hu, G. and Y. Liu. 2018. “Three-minute thesis presentations as an academic genre: A cross-disciplinary study of genre moves.” *Journal of English for Academic Purposes* 35, 16–30. doi: 10.1016/j.jeap.2018.06.004.
- Hyland, K. 1998. *Hedging in scientific research articles*. Amsterdam: John Benjamins.
- Hyland, K. 2004. “Graduates’ gratitude: The generic structure of dissertation acknowledgements.” *English for Specific Purposes* 23(3), 303–24. doi: 10.1016/s0889-4906(03)00051-6.
- Hyland, K. 2005a. *Metadiscourse: Exploring interaction in writing*. London: Continuum.
- Hyland, K. 2005b. “Stance and engagement: A model of interaction in academic discourse.” *Discourse Studies* 7(2), 173–92. doi: 10.1177/1461445605050365.
- Hyland, K. 2007. “Stance and engagement: A model of interaction in academic discourse.” In *Benchmarks in discourse studies*, edited by T. A. van Dijk, p. 102–21. New York: Sage.
- Hyland, K. 2009. *Academic discourse: English in a global context*. Continuum.
- Hyland, K. and P. Shaw. 2016. *The Routledge handbook of English for academic purposes*. New York: Routledge.
- Jordan, M. P. 1998. “The power of negation in English: Text, context and relevance.” *Journal of Pragmatics* 29(6), 705–52. doi: 10.1016/S0378-2166(97)00086-6.
- Kwan, B. S. C. 2006. “The schematic structure of literature reviews in doctoral theses of applied linguistics.” *English for Specific Purposes* 25(1), 30–55. doi: 10.1016/j.esp.2005.06.001.
- Labov, W. 1984. “Intensity.” In *Georgetown university round table on languages and linguistics*, edited by D. Schiffrin, p. 43–70. Washington: Georgetown University.
- Lam, S. L. and P. Crosthwaite, 2018. “Appraisal resources in L1 and L2 argumentative essays: A contrastive learner corpus-informed study of evaluative stance.” *Journal of Corpora and Discourse Studies* 1(1), 8–35. doi: 10.18573/jcads.1.
- Lei, L. 2012. “Linking adverbials in academic writing on applied linguistics by Chinese doctoral students.” *Journal of English for Academic Purposes* 11(3), 267–75. doi: 10.1016/j.jeap.2012.05.003.
- Lemke, J. 1992. “Interpersonal meaning in discourse: Value orientations.” In *Advances in systemic linguistics: Recent theory and practice*, edited by M. Davies and L. Ravelli, p. 82–194. London: Pinter.
- Lemke, J. 1998. “Resources for attitudinal meaning: Evaluative orientations in text semantics.” *Functions of Language* 5(1), 33–56. doi: 10.1075/fol.5.1.03lem.
- Li, T. and S. Wharton. 2012. “Metadiscourse repertoire of L1 Mandarin undergraduates writing in English: A cross-contextual, cross-disciplinary study.” *Journal of English for Academic Purposes* 11(4), 345–56. doi: 10.1016/j.jeap.2012.07.004.
- Loghmani, Z., B. Ghonsooly, and M. Ghazanfari. 2020. “Engagement in doctoral dissertation discussion sections written by English native speakers.” *Journal of English for Academic Purposes* 45, 1–13. doi: 10.1016/j.jeap.2020.100851.
- Martin, J. R. and D. Rose. 2003. *Working with discourse: Meaning beyond the clause*. London: Continuum.
- Martin, J. R. and P. R. R. White. 2005. *The language of evaluation: Appraisal in English*. London: Palgrave Macmillan.
- Moghaddasi, S. and H. Graves. 2017. “‘Since Hadwiger’s conjection... is still open’: Establishing a niche for research in discrete mathematics research article introductions.” *English for Specific Purposes* 45, 69–85. doi: 10.1016/j.esp.2016.09.003.
- Ochs, E. and B. Schieffelin. 1989. “Language has a heart.” *Text* 9(1), 7–25. doi: 10.1515/text.1.1989.9.1.7.
- O’Donnell, M. 2019. *CorpusTool (version 3.3)*. Retrieved 28 Jan 2020, from <http://www.corpustool.com/download.html>.
- Ono, M. 2017. “Move-step structures of literature Ph.D. Theses in the Japanese and UK higher education.” *Journal of Writing Research* 8(3), 469–91.
- Pagano, A. 2002. “Negatives in written text.” In *Advances in written text analysis*, edited by M. Coulthard, p. 250–65. London: Routledge. doi: 10.4324/9780203422656.
- Paltridge, B. and S. Starfield. 2020. *Thesis and dissertation writing in a second language* (2nd edn). London: Routledge.

- Peng, H. 2010. *Chinese PhD thesis acknowledgements: A communities of practice perspective*. Bern: Peter Lang.
- Pitts, A. 2011. "Exploring a pragmatic ambiguity of negation." *Language* 87(2), 346–68. <http://www.jstor.org/stable/23011627>.
- Roeber, C. and A. Phakiti. 2017. *Quantitative methods for second language research: A problem-solving approach*. Routledge.
- Seuren, P. A. 2000. "Presupposition, negation and trivalence." *Journal of Linguistics* 36(2), 261–97. <https://www.jstor.org/stable/4176593>.
- Shehzad, W. 2008. "Move two: establishing a niche." *Ibérica* 15, 25–50. <https://dialnet.unirioja.es/servlet/articulo?codigo=2573820>.
- Soler-Monreal, C., M. Carbonell-Olivares, and L. Gil-Salom. 2011. "A contrastive study of the rhetorical organisation of English and Spanish PhD thesis introductions." *English for Specific Purposes* 30(1), 4–17.
- Swales, J. 1990. *Genre analysis: English in academic and research settings*. Cambridge: Cambridge University Press.
- Swales, J. M. and C. Feak. 2000. *English in Today's Research World*. Michigan: University of Michigan Press.
- Swales, J. and C. Feak. 2002. *Academic writing for graduate students: Essential tasks and skills* (3rd edn). Michigan: University of Michigan Press.
- Tankó, G. 2017. "Literary research article abstracts: An analysis of rhetorical moves and their linguistic realizations." *Journal of English for Academic Purposes* 27, 42–55.
- Thompson, P. 2013. "Thesis and dissertation writing." In *The handbook of English for specific purposes*, edited by B. Paltridge and S. Starfield, p. 283–99. New Jersey: John Wiley & Sons. doi: 10.1002/9781118339855.
- Thompson, P. 2016. "Genre approaches to theses and dissertations." In *The Routledge handbook of English for academic purposes*, edited by K. Hyland, and P. Shaw, p. 379–91. New York: Routledge.
- Thompson, G. and Y. Ye. 1991. "Evaluation of the reporting verbs used in academic papers." *Applied Linguistics* 12(4), 365–82.
- Tottie, G. 1991. "Conversational style in British and American English: The case of backchannels." In *English corpus linguistics*, edited by K. Aijmer and B. Altenberg, p. 254–71. London: Longman.
- Wang, D. and X. Guan. 2013. "An analysis of appraisal in CEO corporate social responsibility statements." *Theory and Practice in Language Studies* 3(3), 459–6. doi: 10.4304/tpls.
- Webber, P. 2014. "Negation in linguistics papers." In *Academic discourse: New insights into evaluation*, edited by G. D. L. Camiciotti and E. Tognini-Bonelli, p. 181–202. Bern: Peter Lang. doi: 10.3726/978-3-0351-0784-5.
- Xiao, W. and S. Sun. 2020. "Dynamic lexical features of PhD theses across disciplines: A text mining approach." *Journal of Quantitative Linguistics* 27(2), 114–33. doi: 10.1080/09296174.2018.1531618.
- Xie, J. 2016. "Direct or indirect? Critical or uncritical? Evaluation in Chinese English-major MA thesis literature reviews." *Journal of English for Academic Purposes* 23, 1–15. doi: 10.1016/j.jeap.2016.05.001.
- Xu, X. and H. Nesi. 2019. "Differences in engagement: A comparison of the strategies used by British and Chinese research article writers." *Journal of English for Academic Purposes* 38, 121–34. doi: 10.1016/j.jeap.2019.02.003.