Phrase Frame Use in EFL Learners' Argumentative Essays: A Corpus-Based Comparative Study

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Abstract: Recently, there has been a growing interest in the features and development of multi-word formulaic sequences for foreign language learners in the field of second language acquisition. While considerable amount of research has been conducted on continuous formulaic sequences both domestically and abroad, scant attention has been rendered to discontinuous phrase frames. Adopting a corpus linguistic perspective, the current study compares and analyses second language learners from different backgrounds with native speakers, focusing on the phrase frame features identified in the argumentative essays written by Chinese and German EFL learners. With a corpus-based approach, the four-word phrase frames are extracted from the English TOEFL essay texts of Chinese and German students using AntConc 4.1.4 corpus analysis software. The top 100 most frequently occurring phrase frames are manually filtered and then classified according to their structural and functional features to identify similarities and differences in terms of overall frequency, structure, and function features of phrase frames between two groups of learners and with those of native writers. The findings reveal that L2 learners significantly employ more fixed and predictable phrase frames than their native writers, with German L2 learners using more phrase frames than their Chinese L2 counterparts. In terms of functional features, German L2 learners use more stance and discourse organizing expressions than Chinese L2 learners. Awareness of the essay genre, English proficiency, and the time-limited writing environment are contributing factors to these features. Therefore, the study suggests that the accuracy and variety of phrase frame usage are more representative of L2 learners' acquisition and writing quality than their quantity of use. This study facilitates an understanding of different EFL learners' phraseological competence through the lens of their p-frame use and provides pedagogical insights accordingly into teaching and learning argumentative essays in EFL contexts.

Keywords: Phrase frames; English argumentative writing; EFL learners; Corpus-based study

1. Introduction

As an important linguistic pattern in natural English discourse, formulaic sequences (Schmitt, 2004; Wray, 2002) play an important role for EFL learners in extracting abstract linguistic structures (Ellis et al., 2015) and establishing their identities in a specific academic community (Wray, 2002). Rather than being bound by the language grammar, formulaic sequences are "a sequence, continuous or discontinuous, of words or other elements, which is … stored and retrieved whole from memory" (Wray, 2002, p.9) which encompass not only continuous multi-word sequences such as n-grams, collocation, chunks, and lexical bundles but also discontinuous sequences such as phrase frames (p-frames) (e.g., it is * that[1]). As semi-fixed phraseological sequence, p-frame retains the rather fixed framework of the continuous word combinations, as well as the relatively flexible lexical variants, thus serving as generalization of the continuous sequence (Fuster-Márquez, 2014). In second language acquisition (SLA) studies, the use of formulaic sequences is essential for accurate and fluent processing of language (Ellis, 1996; Li et al., 2020), with learners progressing from the use of memorized fixed phrases, through semi-fixed p-frames, to more open grammatical constructions (Ellis et al., 2008; O'Donnell et al., 2013). In L2 writing studies, whether learners can use p-frames appropriately to construct their epistemological position and conduct efficient dialogues in the academy, affects the accuracy, authenticity, and readability of their language. The explicit manifestation of p-frame uses in written texts, therefore, has become a pivotal criterion for assessing the writing quality and L2 English learners' phraseological competence, thus being of essential research value (Appel, 2022).

At present, a plethora of corpus-based empirical studies are flourishing in L2 studies, which increasingly deepens scholars' understanding of the formulaicity of language (Garner, 2016; Nekrasova-Beker, 2021; Ren, 2022; Tan & Römer, 2022). Due to the accessibility of spoken and written corpus, most studies focus on students' written language. For example, Garner (2016) investigates German EFL learners writing based on EF-

[1] The asterisk (*) refers to the "variants" of p-frames, which is also the items that can fill the variable slot (e.g., important, clear, and noticed in *it is * that*.

Cambridge Open Language Database which includes diverse writing tasks ranging from descriptive essays to practical emails and movie reviews. Ren (2022), however, examines the use of p-frames with an emphasis on academic writing of learners from different disciplines. An increasing number of scholars have related p-frames to register variation (Gray & Biber, 2013) and rhetorical moves (Lu et al., 2021). While extensive research has shown the important role of these non-continuous sequences in the writing practices of EFL learners, linguists are particularly interested in published research articles (RAs) or dissertations that focus on introductions (Lu et al., 2021), discussion sections (Golparvar & Barabadi, 2020), or even the relatively overlooked figure legends (Liu et al., 2023). There is devoid of p-frame research focusing on EFL learners' writing in one specific genre and in a time-limited writing context.

Echoing the call for more empirical studies of EFL learners' p-frame use in more genres and contexts, the present study attempts to investigate the argumentative essays by different cohorts of EFL learners through a corpus-based comparative approach. Specifically, the study will compare the similarities and differences of p-frame use in terms of overall presentation and functional presentation in Chinese and German EFL learners' Test of English as a Foreign Language (TOEFL) writing with those of first language (L1) English writers' argumentative essays. In addition, through a comparative analysis of p-frames used by EFL learners with references to L1 speakers, it is expected to present a comprehensive portrayal of the phraseological competence of EFL learners, thereby providing pedagogical implications for L2 writing instruction.

2. Research Design

2.1 Research Questions

The present study attempted to adopt a corpus-based method to investigate the p-frame use in the argumentative essays of two cohorts of EFL learners, namely Chinese and German EFL learners. By analysing the overall features, predictability, and variability as well as functional features of p-frame use, it is hoped to gain insights about EFL learners' phraseological competence. As a reference for the current study, argumentative essays written by their L1 English counterparts were also collected and analysed to better capture the peculiarities of learners' p-frame use. Specifically, the research aims to answer the following three questions:

1. Compared with their L1 English counterparts, what are the overall types and tokens of p-frame use of Chinese and German EFL learners in English argumentative writing;
2. Compared with their L1 English counterparts, what are the similarities and differences of p-frame variability and predictability between these two groups;
3. Compared with their L1 English counterparts, what are the similarities and differences of p-frame use across the functional categories between these two groups?

2.2 Corpora

The EFL learners' argumentative essays taken as the two observed corpora were sourced from the ETS Corpus of Non-Native Written English (hereinafter referred to as ETS Corpus), developed by the Educational Testing Service (Blanchard et al., 2014). ETS Corpus consists of 12,100 English essays each with a score level (low/medium/high) written by EFL learners of 11 different languages from independent writing tasks of TOEFL, which is an international normalized test of academic English proficiency. Test-takers are required to express their opinion about a specific issue in this argumentative writing task.

Among these 11 EFL learner groups, Chinese and German test-takers, as the representatives of the Sino-Tibetan and Indo-European language families respectively, become the focal point of this study. In terms of the reference corpus for comparison, the current study derived argumentative texts from two available ready-made corpora, namely Native English Speakers Similarly or Identically-Prompted Essays (NESSIE) and The Louvain Corpus of Native English Essays (LOCNESS) to construct the English L1 Argumentative Essay Corpus (LAEC). Through meticulously manual selection by the two researchers, a total of 916 argumentative essays (338 from LOCNESS and 578 from NESSIE) were retained after excluding essays of explanatory, narrative, and practical writing genres. Detailed information of the corpora is shown in Table 1.

Table 1: Detailed information of the learner corpora and reference corpus.

Corpus	Texts	Types	Tokens
ZHOC	560	9,375	182,909
DEUC	560	8,707	192,772
LAEC	916	19,145	404,698

2.3 Phrase Frame Identification and Analysis

The current study adopted the fully inductive approach (Fuster-Márquez, 2014; Grabowski, 2015; Gray & Biber, 2013) that begins with a frame and a variable slot through the software *AntConc 4.1.4* (Anthony, 2022). Only p-frames that are four words long and contain one internal variable slot were centered. After rounds of preliminary pilot extractions in this study, we observed that three-word p-frames were often incomplete, whereas the number of five-word p-frames was insufficient for analysis. Therefore, a rather conservative frequency threshold of 40 occurrences per million words (PMWs) was adopted. Additionally, in line with previous studies (Ren, 2022; Tan & Römer, 2022), each p-frame should occur in at least five different texts and two different topics.

The extracted p-frames were further filtered manually through concordance (KWIC) analysis. P-frames with only one variant or misspellings (e.g., by a * guide with variants tour, tourn, tours) were removed. Additionally, p-frames crossing sentence or clausal boundaries (e.g., the places that we) or four-word p-frames embedded in five-word p-frames (e.g., lot of * to in a lot of * to) were deleted. For example, the p-frame *the * of the* (e.g., *the opening of the*, and *the advent of the*), despite its high frequency and extremely diverse variants in both English L1 and L2 speakers' essays, was discarded as it did not constitute a phrase with a distinct pragmatic or discourse function. It should be noted that two researchers filtered the candidates independently and reached 95 percent inter-rater agreement. The remaining discrepancies were then discussed until complete agreement was achieved.

Then the most frequent 100 p-frames would be analyzed in terms of three aspects. First, the variability information of a p-frame was represented as the type-token ratio (TTR) generated by *AntConc 4.1.4* ranging from 0 to 1. All the p-frames were classified into three groups (Gray & Biber, 2013): (1) highly variable ($0.7 <$ variability ≤ 1), (2) variable ($0.3 <$ variability ≤ 0.7), and (3) fixed (variability ≤ 0.3). Second, Following Tan and Römer (2022), normalized entropy (H_{norm} henceforth) provided by *AntConc 4.1.4* was employed to determine the predictability of a p-frame. H_{norm} indicates to what extent a probability distribution is uncertain. Following Garner (2016), the present study attempts to classify the p-frame predictability into four categories: (1) highly predictable ($0 < H_{norm} \leq 0.25$), (2) predictable ($0.25 < H_{norm} \leq 0.5$), (3) less predictable ($0.5 < H_{norm} \leq 0.7$), and (4) unpredictable ($0.7 < H_{norm} \leq 1$). As for p-frames' function, the variant-based functional taxonomy by Simpson-Vlach and Ellis (2010) was adopted.

3. Results and Discussion

3.1 Types and Tokens of Phrase Frames

Through a comparative analysis of the top 100 (types = 100) most frequent four-word p-frames among the three corpora, namely ZHOC, DEUC, and LAEC, it was found that the normalized frequency of tokens (per 10, 000 words) is the highest in DEUC. Conversely, the frequency of four-word p-frames in ZHOC comes second, while their L1 English counterparts in LAEC exhibit the least usage of such p-frames. The comparison of four-word p-frames in the three corpora in terms of token frequencies is presented in Table 2 below.

Table 2: Comparison of tokens of four-word phrase frames in the three corpora

Corpus	ZHOC	DEUC	LAEC
Tokens	3,349	4,024	4,757
Normalized Freq. (per 10,000 words)	183.10	208.74	117.54

The log-likelihood ratio test was conducted to examine the variations in the tokens of four-word p-frames among the three corpora. The results revealed that there were significant differences in the usage of four-word p-frames across the three corpora. Specifically, the frequency of four-word p-frames was found to be higher in ZHOC ($LL = 373.48$, $p < 0.001$) and DEUC ($LL = 691.37$, $p < 0.001$) than in LAEC. Furthermore, DEUC

exhibited a higher frequency of four-word p-frames than ZHOC (LL = 373.48, p < 0.001). Interestingly, the difference between ZHOC and LAEC was found to be less significant compared to that between DEUC and LAEC (LL = 373.48 < 691.37), which indicates that Chinese EFL learners use fewer four-word p-frames than German EFL learners.

This result is in alignment with Paquot (2013) who found that EFL learners tend to use more recurrent continuous formulaic sequences for expression in their writing than their L1 English counterparts and that there is a tendency for the number of such combinations to decrease as bilingual proficiency increases. This overuse of formulaic sequences in learners' writing may be attributed to their inadequate acquisition which causes students to rely on a larger number of word combinations for text organization and discourse representation. In the current study, Chinese and German EFL learners were also found to employ significantly more p-frames in their TOEFL argumentative writing. Despite the TOEFL being designed for L2 English speakers aiming to enroll in universities or programs in English-speaking countries and who have already achieved a relatively advanced language proficiency, EFL learners continue to exhibit insufficient mastery. Instead, they rely on employing an increased number of p-frames to articulate their viewpoints and bolster their arguments. German EFL learners employ p-frames significantly more frequently than their Chinese counterparts, probably due to the shared Germanic language family of English and German, which results in a high degree of similarity in formulaic sequences and fewer challenges during acquisition. In contrast, Chinese belongs to the Sino-Tibetan language family, posing relatively more challenges in acquiring formulaic sequences.

3.2 Variability and Predictability of Phrase Frames

Through intercorporal comparison, the distribution of the p-frames across three variability levels were presented, which demonstrated the extent of language formulaicity in the argumentative writing. As shown in Fig. 1, the numbers of distinct p-frames suggested no significant difference between the p-frame variability of Chinese and German EFL learners (Fig. 1 c-1), while there were significant preferences when EFL learners were compared with their L1 counterparts (Fig. 1 a-1, b-1). Among the most frequently used 100 p-frames, Chinese learners used significantly more fixed p-frame types than L1 counterparts (LL = 7.82, p < 0.005). German EFL learners exhibited significantly more reliance on fixed p-frames (LL = 12.84, p < 0.001) and less reliance on highly variable ones (LL = 10.89, p < 0.005). In terms of the normalized tokens in the three corpora, both Chinese and German EFL learners relied statistically more on fixed p-frames and less on variable sequences and highly variable sequences (Fig. 1 a-2, b-2). However, despite German writers having a higher number of total normalized tokens, Chinese EFL learners employed significantly more highly variable p-frames (Fig. 1 c-2, LL = 72.45, p < 0.001).

The above findings informed by Fig. 1 have provided further evidence that EFL learners tend to utilize more p-frames in their writing practice, with a particular reliance on fixed p-frames. Additionally, this finding has supported the notion that learners prioritize the use of formulaic language when composing written discourse. Students stick with familiar and safe sequences "which the learners feel confident in using" (Schmitt, 2004, p.13), which also leads to a limited lexical diversity in EFL learners' writing. However, it is also important to note that it is not that their L1 English counterparts do not use highly fixed p-frames; in fact, *on the * hand* (TTR = 0.04) occurs very frequently in their writing. And it is not that learners are completely incapable of using highly variable p-frames; for instance, the p-frame *in the * of* ranks as the 5th most frequently used in German EFL learners' writing (TTR = 0.65) and the 21st most frequent in Chinese EFL learners' essay writing (TTR = 0.84).

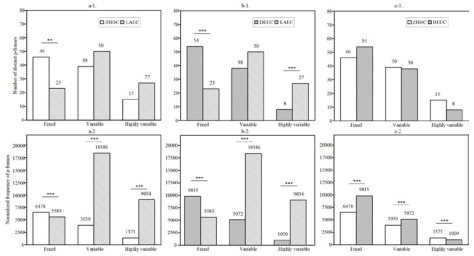

Figure 1: Variability of the four-word p-frames in the argumentative essays by Chinese and German EFL learners compared with their L1 English counterparts. ** p < 0.01, *** p < 0.001

Regarding the distribution of p-frames across four predictability levels, no significant differences were revealed between ZHOC and DEUC in terms of the p-frame types, while German EFL learners used significantly more less predictable and unpredictable p-frames in terms of the normalized tokens than Chinese EFL learners as

shown in Fig. 2. When shifting to comparison between learners and their L1 English counterparts, a larger number of predictable p-frames were used in the ZHOC and DEUC essays than were in LAEC essays, showing significantly higher normalized frequency. However, another finding of interest is that both groups of EFL learners use significantly more less predictable p-frames than their L1 English counterparts, which seems to contradict previous findings. One approach that may be helpful is to see unpredictable and less predictable p-frames as a broad category, and then this category of hard-to-predict p-frames can be found with significantly lower normalized frequency in both Chinese EFL learners (LL = 1924.88, $p < 0.001$) and German EFL learners (LL = 150.57, $p < 0.001$).

Based on a close examination of the p-frame lists, the reason for learners' more use of less predictable p-frames may be attributed to the presence of ungrammatical or unintentional misspellings in both Chinese and German EFL learners' essays. In essence, the predictability value of p-frames may have been to some extent overestimated due to the inclusion of misspelled variants, resulting in an inflated observed frequency. As such, the actual number of hard-to-predict p-frames may be lower than what was reported in this study. But even so, the differences in the use of p-frames between EFL learners and their L1 English counterparts in writing argumentative essays have been found, which signifies a deficiency of EFL learners' acquisition and highlights the potential for further development.

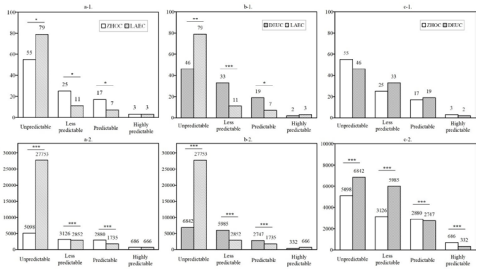

Figure 2: Predictability of the four-word p-frames in the argumentative essays by Chinese and German EFL learners compared with their L1 English counterparts. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.3 Functional Features of the Phrase Frames

On the whole, three groups of writers displayed similar distribution patterns as can be seen from Fig. 4 a-1, b-1, c-1. Of the top 100 most frequent p-frames in all three corpora, referential p-frames remain the largest of the three major functional groupings, demonstrating the focus of the genre to deliver informational content. This result was in line with previous studies on p-frames in academic writing (Golparvar & Barabadi, 2020; Liu & Chen, 2022), where referential p-frames (i.e. *in the * of* in example 1) were also found to be the predominant type. Stance p-frames (i.e. *people are * to* in example 2) rank as the second largest category in all three corpora; ZHOC and DEUC contain a higher proportion of 35 percent and 38 percent respectively, whereas LAEC contains 28 percent. P-frames that perform the discourse organizational function (i.e. *on the * side* in example 3) are the least utilized, with their percentage being around 10 percent.

- Example 1. ... are now eager to research *in the field of* renewable energy and seek to invent ... (from ZHOC)
- Example 2. ... of these weight-loss techniques, young *people are likely to* give them up sooner or later ... (from LAEC)
- Example 3. This is the way older people like to follow but younger people *on the other side* have not got in mind. (from DEUC)

Interestingly, when examining the overall function distribution as illustrated above, there appears to be some convergence and divergence between findings in the current study and in some previous studies (Fuster-Márquez, 2014; Lu et al., 2018; Ren, 2022; Tan & Römer, 2022). Previous studies all conclude that referential, namely research-oriented p-frames are the most used which is consistent with the present finding (Fuster-Márquez, 2014; Tan & Römer, 2022). However, they also report that stance p-frames or participant-oriented sequences are the smallest ones in their corpora (Lu et al., 2018). Similarly, Ren (2022) argues that there exists an overuse of stance p-frames in their L1 English counterparts. These results are quite different from the findings of this study. One of its most probable explanations is the corpus genre, as previous scholars all investigate academic writing, whereas this present study examines argumentative essays. Both genres focus on the delivery of information, so their referential p-frames outnumber the other functional categories, but

the argumentative essays focus additionally on conveying the writer's point of view. There are prompts of the learner corpora used in this study which explicitly state "Do you agree or disagree ...". So, the writer's primary task and aim in writing is to express his or her position clearly. In this sense, it is reasonable that stance p-frames are not the least frequent in the present study.

With respect to the underuse or overuse issue through log-likelihood ratio tests, new results can be yielded as for the normalized frequency of p-frames from each primary function (Fig. 4 a-2, b-2, c-2). It can be found from Fig. 4 c-2, within the two learner groups, significant difference is revealed with the fact that Chinese EFL learners underused referential (LL = 21.07, $p < 0.001$), stance (LL = 343.62, $p < 0.001$) and discourse organizing frames (LL = 214, $p < 0.001$) compared to German EFL learners, which can be attributed to German EFL learners' over-reliance on such recurrent sequences to a large extent (Schmitt, 2004). In comparison with LAEC, both Chinese and German EFL learners employed significantly more stance p-frames and fewer referential p-frames. German students also employed significantly fewer discourse organizing frames (LL = 285.36, $p < 0.001$). Their excessive use of stance p-frames can be explained by the argumentative genre of the selected essays in the corpora. Furthermore, these argumentative essays were collected from the TOEFL writing test, a time-constrained examination with outcomes that can exert a direct and substantial influence on test-takers. Consequently, participants are justifiably under pressure to demonstrate their ability to compose well-crafted argumentative essays with distinct argumentative characteristics. It is through the use of stance expressions that "writers stamp themselves on their claims and propositions, and express the attitude they hold toward the content" (Wu & Paltridge, 2021, p. 2) as well as make their personal response to the given prompt. However, whilst students' awareness is helpful, their English proficiency is probably limited, so it remains challenging to demonstrate their familiarity with the discussed topics, which results in the underuse of referential p-frames.

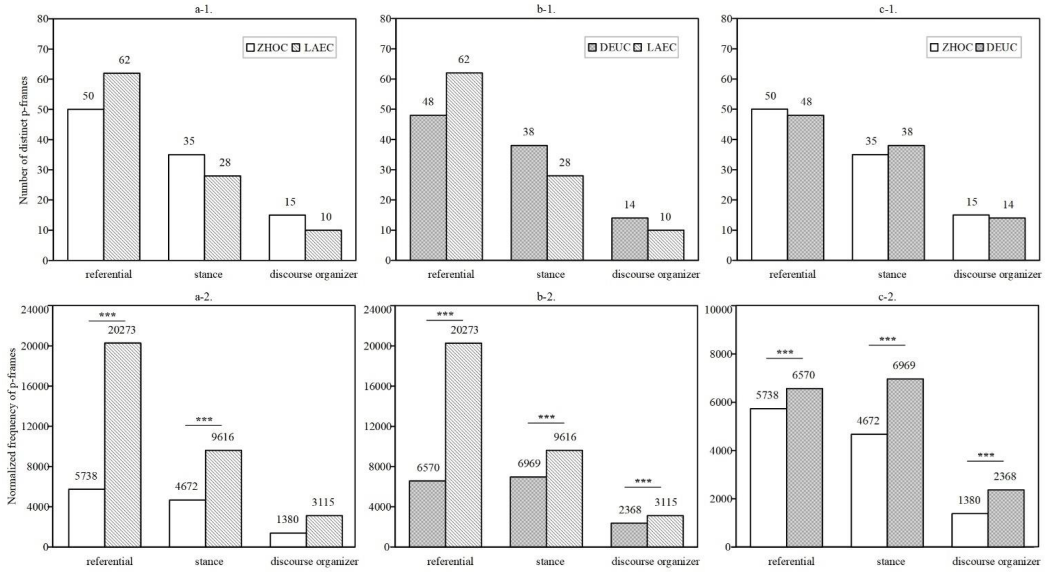

Figure 3: Functions of the four-word p-frames in the argumentative essays by Chinese and German EFL learners compared with their L1 English counterparts. *** $p < 0.001$

German EFL learners' tendency to overuse could be attributed to the crosslinguistic influence of the German language when compared to Chinese EFL learners. Within the context of the current study, the anticipatory-*it* structure serves as an illustrative example. In German, the word "es" can function similarly to the anticipatory-*it* in English, representing subordinate clauses (e.g., "It is good to do something." and "Es ist gut, etwas zu tun."). However, Chinese lacks an equivalent counterpart for the anticipatory-*it* structure, which can pose a significant challenge for Chinese EFL learners. As evident from the p-frame lists, the p-frame "*it is * to*" occurs with a normalized frequency of 794.53 occurrences PMWs in DEUC, which is higher than the 415.42 occurrences PMWs in ZHOC. Likewise, the p-frame "*it is * that*" was used 220.89 instances PMWs in DEUC, which is higher than the 200.67 instances PMWs in ZHOC. The frequency disparities suggest a possible crosslinguistic influence from EFL learners' native language to their foreign language learning (Güngör & Uysal, 2020). However, the p-frame "*it is * to*" continues to be the most frequently used in Chinese EFL learners' writing, which can be attributed to students' awareness of the differences and deliberate practice based on explicit instruction (Chen & Hu, 2020).

Furthermore, Huang (2015) pointed out that more does not mean better, and "quality speaks louder than quantity in benchmarking phraseological proficiency" (p. 21). Although EFL learners are inclined to use a limited number of formulaic word combinations more frequently and even though senior students tend to use them with higher lexical complexity in their essay writing, they have not used them significantly more accurately than junior ones. As is the case in the present study, EFL learners use significantly more p-frames than their L1 English counterparts, but there are also many ungrammatical or misspelling sequences. Meanwhile, there still remains a gap between the p-frame structural and functional realization of learners and that of their L1 English counterparts. Therefore, the quality and diversity of the p-frame used in students' writing are much more important than simple quantity. Only quantitative gains cannot guarantee the progress of L2 proficiency. As illustrated by Ellis (1996), language learning is the learning of sequences and learners "must acquire word sequences in phrases" (p.92). The goal of effective instruction is to not only raise learners' awareness of using formulaic sequences but also to instruct them to use them in a grammatically correct and functionally appropriate manner.

4. Conclusion

This current study, by comparing the p-frames used by Chinese and German L2 learners with those used by their L1 English counterparts, has produced three major findings that bear important implications. Both Chinese and German EFL learners used significantly more fixed and predictable p-frames than their L1 English counterparts. Chinese EFL learners reported significantly fewer tokens of p-frames than German learners, which were significantly more variable, but also significantly more predictable. As for the functional features of p-frame use, although Chinese students had significantly fewer p-frames for each functional category than German, they all used significantly more stance p-frames and fewer referential p-frames than their L1 English counterparts. Finally, it is suggested that EFL learners should understand the characteristics of p-frames and learn to use them accurately rather than blindly piling up more and more of them. This study highlights the importance of corpus-based, data-driven phrase learning in writing instruction. Emphasizing frequent and variable p-frames raises students' awareness and promotes conscious learning. Corpus technology, including various corpora and concordance tools, aids in teaching appropriate word and phrase use. This self-motivated exploratory learning helps learners grasp the structure and function of p-frames effectively.

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