The Persuasiveness of Research Abstracts through Analytical Thinking and Emotional Tone Domains in Academic Research Writing

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Abstract. Analytical Thinking and Emotional Tone are two important psycholinguistic domains of the LIWC framework by Pennebaker, Boyd, Jordan, & Blackburn [12] LIWC framework. These domains were used to examine the perceptions on the unresolved issue of native and non-native English rhetoric in academic writing. The persuasiveness of these two domains was explored in the genre of research abstract compositions. One hundred and twenty Malaysian ESL respondents were sampled in this survey research to rate their perceptions of persuasiveness towards selected research abstracts in an adapted Persuasive Discourse Inventory (PDI) questionnaire. The selected research abstracts (RAs) were presented based on two criteria; 1) RAs with a standard usage of English nativeness versus non-nativeness, and 2) RAs with an over-usage or under-usage of Analytical Thinking and Emotional Tone. It was found that RAs with non-native English rhetoric were more persuasive to ESL readers than RAs with native English in composing research abstracts, thus implying that native English rhetoric was apparently perceived as non-essential to ESL users in academic research writing. The persuasiveness of non-native English rhetoric was further evident through an over usage of elements related to Analytical Thinking and an under usage of elements related to Emotional Tone. Future research was recommended to explore the possible mediation of culture on the mismatch of perceptions between prior literature on the ESL writers' tendency to write with over usage of emotional tone compared to that of analytical Thinking because the ESL readers' perceptions in this research showed the opposite findings.

Keywords: Academic Research Writing, Aristotelian Rhetoric, Analytical Thinking, Emotional Tone, Persuasive Discourse Inventory (PDI).

1   Introduction

There are a variety of rhetorical styles and patterns demonstrated by English as a second language (ESL) academic writers in composing their academic research papers. Their rhetorical patterns can distinguish their writing from other groups of writers. According to [1], [2], and [3], some major and minor differences in rhetorical features were discovered between ESL writers and native English writers in the way they presented their academic texts. The differences were generally manifested at the word, phrasal, organizational, and textual levels.

[1] discovered in their study of contrastive rhetoric between L1 and L2 English writers of different countries and first languages that they expressed their ideas in writing in distinctly marked forms of development. This argument is consistent with [4], who generally concluded that writers from the Oriental, Romance, and Semitic regions developed their argumentation unlike the way shown by Anglo-European native English writers. For instance, according to [2] and [3], one of the common differences was manifested in their choice of words to create different appeals for different purposes. Native and non-native English writers chose words related to facts, figures, proper nominalizations, proper nouns, and technical terms to create logical appeals. Meanwhile, words with positive and negative connotations were used to create emotion-related appeals. [5] discovered that writers from countries with English as their native language would mostly use words that can evoke logical appeals, whereas writers from English as non-native language countries would mostly use words that can evoke emotional appeals in the tone of their academic essays. [2] substantiated this argument in their contrastive study of rhetoric on the use of logical appeals between native English (NE) and non-native English (NNE) research writers that the former group showed lesser emotional usage of lexico-phrasal items than the native English writers, indicating that different groups of academic English writers employed logical and emotional appeals differently to create rhetorical appeals in their academic writing. Moreover, [3] concurred with Kaplan [4] and Connor [1], who perceived these linguistic differences as the unique rhetorical patterns identified with different writers of various regions. By connecting the importance of academic writing with the Aristotelian concept of rhetorical appeals, [6] further underscores that an academic writer, native or non-native English alike, could create the appeals of their writing by refraining from excessive usage of one specific rhetorical aim over other rhetorical aims. For instance, they may not focus their writing goal on emotional over credible or logical appeals as it could overload their compositions with emotional tone at the superficial level.

Due to the presence of marked differences and writing styles, academic writing is challenging for non-native English (NNE) writers, especially when they are expected to write like native English (NE) writers. Regarding the native likeness, their written products are easily recognized as nowhere near or unlike the native English writers. [7] suggested that this perception was most likely held by many native and near-native readers who would compare the writing qualities of non-native English writers to native English in terms of their writing patterns and rhetorical appeals.

Thus, the present study sought to discover if 1) English nativeness types and 2) the different degrees in the usage of two psycholinguistic domains - Analytical Thinking and Emotional Tone in academic research writing would affect the readers' perceptions in determining the appeals and persuasiveness of their academic texts. Therefore, the following research questions were constructed:

1. Are there significant differences in persuasiveness scores between the RAs with the English nativeness of Analytical Thinking (AT) and Emotional Tone (ET) and the RAs with the English non-nativeness of Analytical Thinking (AT) and Emotional Tone (ET)?
2. Are there significant differences in persuasiveness scores between RAs with High Analytical Thinking (HAT) but Low Emotional Tone (LET) and RAs with Low Analytical Thinking (LAT) but High Emotional Tone (HET)?

2   Literature Review

According to [8], persuasion in rhetoric refers to the subconscious process of trying to change the attitudes or actions of a person through the strategic and tactical application of words. Ong [9] further suggested that the concept has been explored in various types of academic and professional discourse and studied in terms of the skillful use of language on the impact on people's perceptions, attitudes, and behaviors. Other terminologies about the same concept are also employed in other subtypes of academic discourse, such as the rhetoric of exposition and argumentation in expository and argumentative essays. As further elaborated by Connor [1], the idea of rhetoric and persuasion has been discovered beyond the famous discipline of communication in the 1960s. As a famous rhetorician, [10] formulated one framework on this concept, which entailed four aims of persuasion - referentiality, persuasiveness, literariness, and expressiveness in shaping various compositions. Afterward, it was rediscovered and used as a measurement tool to examine the purpose of persuasion by looking at the rhetorical choice of words in various texts and contexts [11].

As proposed by [12], there were three broad psycholinguistic domains expressed through the writers' choice of words. These elements were termed the Summary Variables of the Language Inquiry of Word Count (SV-LIWC) consisting of Analytical Thinking (AT), Clout (Cl), and Emotional Tone (ET) that could be used to measure the rhetorical frequencies, density, and richness of a writers' lexico-phrasal items. These domains are found to be aligned with Aristotelian Rhetoric (AR) in the field of persuasion, one of the many theoretical influences of Contrastive Rhetoric (CR). According to Aristotle and Kennedy [13], Aristotelian rhetoric has three main modes of persuasion: *Logos*, *Ethos*, and *Pathos*. *Logos*, as the first mode of persuasion, is used to appeal to the audience's logical Thinking; meanwhile, *Ethos* is used to show the credibility of the authors to the audience. The third mode is *Pathos*, which convinces the audience by appealing to their emotions. Osman, Musa, Rahim, & Tobi [14] asserted that these three modes of persuasion emerged as a tested measurement scale to describe the rhetoric of academic compositions, ENL, and ESL alike. By integrating these two theoretical models of SV-LIWC and AR in their study, Mohamad [2] investigated the presence of these elements through the lexico-phrasal choice of

words demonstrated by ESL writers in their abstract compositions from various indexed journals. Compared to native English writers' abstract texts, the Analytical Thinking domain used to measure the presence of *Logos,* and Emotional Tone to measure the presence of *Pathos* were the significant descriptors of non-native English writers' texts. However, they found a non-significant usage of the Clout dimension in determining the presence of *Ethos* in the same abstract compositions [2].

The concept of persuasion in the writers' lexico-phrasal choice of rhetoric was also explored by [15] in their study on 5 million lexical items in a compilation of essays. They concluded that people would write their texts with a positive tone over a negative tone to appeal to emotions. The finding led to the development of a powerful language-based measurement tool to examine the presence of emotional sentiment in a text. In the same vein, [12] developed a quantitative software application based on the LIWC2015 framework, which can generate the frequency percentages of various lexical items identified with three psycholinguistic domains. As discussed earlier, one of the domains is the Emotional Tone (ET). The interest in the software which can generate the frequency percentage scores for positive and negative choice of words was also demonstrated by [16] by developing an NVivo software that enables the researchers to conduct an overall sentiment analysis of text and determine its different tones based on the overall language use. Furthermore, the Readable.com online application is another tool of online application that can be used to analyze emotional sentiment based on the frequencies in the choice of words presented in a text [17]. In their qualitative study of institutional reports on the global crisis published annually, [15] applied the NVivo software to analyze the words used to determine the tones and emotions in human language. It was discovered that the positive tone of language was demonstrated highly frequently through numerous lexical items, which reflected optimism and confidence, compared to the negative tone of words, which demonstrated disappointment and displease. In addition, embedded with emotional connotations, adjectives were commonly applied to evoke a trend of positive sentiment toward future goals to persuade the target readers. [18] and [19] also supported this conclusive claim that adjectives with cheerful tones were manipulated to appeal to the general readers in numerous texts. [19] further explained a prevalent pattern in the choice of positive words in a corpus of 2.2 million research articles used as a means of "soft selling" method by many authors in various disciplines. It was elaborated that the positive choice of words was mostly shown in the result sections in most of the article publications under their examination. The same conclusion on applying words with a positive tone was similarly supported by [20], who studied a compilation of research abstracts published for 40 years from 1974 to 2014. It can be concluded from the above studies that the positive tone in the choice of words was the most common strategy in the rhetoric of composing academic research papers.

The same finding was also substantiated by [21], [22], [18], and [19]. Their studies on the sentiment in the readers' choice of words revealed that readers' perceptions were influenced by the purposeful use of positive words over negative words depending on the specific type of discourse. The persuasion in rhetoric with the intended purpose of exerting influence on people's sentiments and perceptions in terms

of the logical, ethical, and emotional aspects is determined by the writers' manipulation of the choice of words and their specific rhetorical aims. In psychology, this purposeful act of writing is known as positivity bias which refers to the skillful use of positive words to appeal to the readers to create specific perceptions and impressions. [20] also studied this psychological construct by examining the ESL writer-reader application of words and language expressions in communicating their emotions. They were asked to give their rating scores in several writing tasks. They showed high percentages of rating scores for three areas - the ability to interpret emotions, their psychological bias to rate the positive words in a text, and the employment of various positive and negative choices of words to express their emotions. In addition, the readers also showed their preference for positive and negative words to show their sentiment towards a preferable topic. Despite its negative connotation, this research eventually underscores the rhetorical usage of emotion-laden words and the significance of their evocative effects on readers' perceptions.

The argumentation on the influence of rhetoric on the audience's perceptions was not new, as it has been rigorously studied since the classical time [13]. However, the extent of the discussion in the context of academic writing in various types of academic texts and discourse and how the logical and emotional elements can be employed to affect the perceptions of academic audiences allows room for further rediscovery. As asserted by [23], this skillful form of rhetoric was found to be richly exploited in academic argumentative essays, which exploited the elements of ethical, logical, and pathetical appeals to various degrees. [2] also substantiated the significant functions of logical and emotional appeals through the deliberate usage of rhetoric in composing academic research abstracts. It was highlighted to be an important skill of academic writers. To further explore the effects of rhetoric on the readers' perceptions of persuasiveness, Persuasive Discourse Inventory (PDI) designed by [24] was introduced as a rating tool of measurement. Based on the raters' scores for the three Aristotelian modes of persuasion, the scale was constructed to examine the respondents' perceptions of persuasiveness towards the presented stimuli. Thus far, it can be concluded that Aristotelian rhetoric and the embedded three modes of persuasion (*Logos*, *Ethos*, and *Pathos*) were examined in numerous studies, and the perceptions of these modes of persuasion are crucial in the field of communication and persuasion.

Despite its triangular nature, the significance of each mode of persuasion was proven to differ from one other mode of persuasion. As studied by [25] and [2], non-native English texts showed different degrees of appeal for the two modes of persuasion – *Logos* and *Pathos*, but the same case was not applicable to the third mode of persuasion - *Ethos*. Both studies further concluded that the two most challenging rhetorical devices to be used in a persuasive text are supporting facts and evidence – demonstrating their usage for logical appeals. These rhetorical devices were the most common feature used by native English writers; thus, it was highly recommended to be included by non-native writers in their written texts. Subsequently, the second most challenging rhetorical feature was the use of emotive items due to their appeals to emotions which would evoke and stimulate the emotional minds of the audience. Thus, it was highly preferable for writers to apply these forms of rhetoric in producing any academic written texts aimed at persuading the readers. This argument is support-

ed by [2], who found a significant relationship between lexical items related to the LIWC Psycholinguistic Analytical Thinking domain and the Aristotelian *Logos* in the research abstracts written by ESL writers. In addition, there was a significant correlation between the lexical choice of words related to the psycholinguistic domain of Emotional Tone and the Aristotelian *Pathos*.

Therefore, studies on the perceptions of these rhetorical appeals would be helpful in enlightening the patterns of readers' attitudes towards texts with different degrees of Analytical Thinking in reflecting Aristotelian *Logos* and Emotional Tone in reflecting Aristotelian *Pathos*. In a survey of an open-ended questionnaire that sought the respondents' preference for the tones and styles of language among Malaysian non-native English (NNE) postgraduate respondents, [26] discovered that these respondents preferred the application of neutral and simple language and tones to make the texts easily understandable and emotionally appealing to the general readers. In another perception study by [27], they found that Malaysian NNE postgraduate writers were prone to use complex types of language as they perceived it as the best way to create logical appeals in the mind of the audience. From the above opposing studies, the NNE academic readers could perceive different forms of rhetorical appeals differently. Therefore, the present study sought to discover if such patterns towards academic research compositions were similarly reflected in the responses of ESL readers.

3   Method

The present study adopted quantitative research with an inferential approach through the application of survey research design. Two groups of selected research abstracts (Native English or NE and non-native English or NNE) with their different categories of rhetorical appeals to Analytical Thinking (AT) and Emotional Tone (ET) domains were employed in this study. The research abstracts were then distributed to NNE respondents for them to indicate their perceptions on a specific scale of persuasiveness to the logical (*Logos*) and emotional (*Pathos*) modes of persuasion. The different categories of Analytical Thinking and Emotional Tone domains were determined based on three-group classification - standardized, high, and low which respectively referred to the average, above-average, and below average usage of AT and ET from the sample population of both groups of NE and NNE writers. Finally, the study sought to discover if the research abstracts presented with these three different categories of appeals were perceived to have different levels of rating scores in terms of logical and emotional persuasiveness to the ESL readers.

Three variables are involved in this study to further elaborate and operationalize the relevant terms mentioned earlier. Firstly, the nativeness types of research abstracts, being the first independent variable, were categorized into native English (NE) and non-native English (NNE) research abstracts. The scale of measurement for this variable is categorical and dichotomous.

Next, the different categories of Analytical Thinking (AT) and Emotional Tone (ET) were the next independent variable assigned with the categorical measurement

scale. The LIWC2015 Analytical Thinking summary domain determined Analytical Thinking to measure the Aristotelian logical appeal. Meanwhile, the Emotional Tone was determined by the LIWC2015 Emotional Tone summary domain to measure the Aristotelian emotional appeal. Based on the LIWC summary scores of AT and ET reported by [2], the range of AT and ET values from the lowest to the highest in NNE and NE RAs were used as references to further define three broad quartiles of LIWC summary values which were the centermost, uppermost, and lowermost bounds. Thus, the different categories of AT and ET were assigned into these three bounds of values – the centermost bound representing the optimal usage of AT-ET (herein referred to as 'Standardized AT/ Standardized ET'), the uppermost bound representing the over usage of AT-ET (referred to as 'High AT/ High ET'), and the lowermost bound representing the under-usage of AT-ET (referred to as 'Low AT/ Low ET'). Furthermore, the first and second variables were independent because there two were interrelated in terms of operational definitions in which the optimal usage would suggest the AT-ET English nativeness. In contrast, the over-usage and under-usage would suggest the AT-ET English non-nativeness.

Finally, the third variable is the perception levels of persuasiveness scores rated by the respondents in the Persuasive Discourse Inventory (PDI) questionnaire in terms of the appeals of *Logos* and *Pathos*, being the dependent variable of the research. The interval measurement scale was assigned to this variable based on the Likert scale (5 options – strongly disagree, disagree, neutral, agree, strongly agree). Further details on this variable and the mechanism of the scale of measurement are elaborated in the data collection and analysis sections.

The two research questions formulated in the early section of the research were drawn from two theoretical assumptions. The first theoretical assumption was used to develop the first research question, which aimed to investigate whether NE and NNE RAs with the standardized Analytical Thinking and Emotional Tone would be perceived differently in terms of their logical and emotional persuasiveness by the ESL readers. The focus of the research question was on the effects of English nativeness (nativeness against the non-nativeness) of the RAs in terms of AT and ET on the perceived levels of persuasiveness towards the research abstracts. The second theoretical assumption was used to formulate the second research question to validate the persuasiveness of AT-ET English non-nativeness in the first research question by further exploring whether the research abstracts with different categories of English non-nativeness of the LIWC psycholinguistic domains (Analytical Thinking and Emotional Tone) would be persuasive differently by the ESL readers. The research question focused on the effects of High AT but Low ET or Low AT but ET on the ESL readers' perceptions of persuasiveness in terms of Aristotelian *Logos* and *Pathos*.

Two hypotheses were fundamentally constructed from the theoretical assumptions of the integrated prior literature on the Aristotelian Rhetoric [13] and LIWC Psycholinguistic Domains [27] for further examination in the specific genre-based context of the present research. The two hypotheses are laid out as follows:

I.   In line with Aristotelian *Logos* and *Pathos*, Native English (NE) research abstracts with average optimal usage of Analytical Thinking and Emotional

Tone would be perceived with greater levels of overall persuasiveness due to their English nativeness from the Non-native English (NNE) research abstracts with the same average optimal usage of Analytical Thinking and Emotional Tone.

II.   In line with Aristotelian *Logos* and *Pathos*, any research abstracts with an over usage of Analytical Thinking but an underusage of Emotional Tone would be perceived with different perceptions of persuasiveness from the research abstracts with an underusage of Analytical Thinking but an over usage of Emotional Tone due to their English non-nativeness.

Both theoretical assumptions were derived from two underpinning theoretical conclusions from prior literature. The first theoretical assumption was drawn from previous research [28] three-group sociolinguistic model of English and the visibility of native English writers' research work and publications [29]-[30]. According to [29] and [30], research publications from native English writers were perceived to be more visible and persuasive due to the writers' English nativeness compared to the research publications from the non-native writers due to their perceptions on the lack of native English rhetoric. Thus, the present study sought to explore if native English research abstracts, with their standardized English nativeness of Analytical Thinking and Emotional Tone would be more persuasive than the non-native English research abstracts with their standardized English non-nativeness of Analytical Thinking and Emotional Tone.

Furthermore, the second theoretical assumption was drawn on the linearity of theoretical claim made by [13] and [12] that any text written with overapplication of logical or emotional appeals should be able to correspondingly evoke the excessive logical and emotional persuasiveness in the minds of the target readers. Similarly, any text written with the underapplication of logical or emotional appeals should be able to correspondingly evoke the same inadequate logical and emotional persuasiveness in the minds of the target readers. Therefore, by applying the same argumentation on stimuli-response linearity to the context of the present research, it can be explored further that any research abstracts, if written with an Over/ High usage of Analytical Thinking but an Under/ Low usage of Emotional Tone, should correspondingly be perceived with the same logical and emotional appeals to the target readers. The opposite trend of persuasiveness can be expected if the pattern is reversed. [2] also supported this correlational claim that analytical Thinking was associated with logical appeals whereas emotional tone was generally associated with emotional appeal.

3.1   Population and Sampling

In this survey research, 120 Malaysian ESL reader respondents from the Academy of Language Studies from Universiti Teknologi MARA (UiTM) were selected to be the respondents by asking them to read and then give their persuasiveness ratings in the PDI questionnaire. A convenient method of random sampling from a specific population was used in selecting these respondents who were the master-degree holders in English language and linguistics or Teaching English as a Second Language (TESL),

thus making them the proficient ESL users. They were all English lecturers, teaching university students English as a second language. They were equipped with research experience in reading and writing academic research articles and publications, as it is one of the university's requirements to publish at least two research articles in indexed journals annually. Each reader respondent spent an average time of 20 minutes completing the questionnaire. There were no native English reader respondents involved in this survey research because the main purpose of the study was to investigate the perceptions of persuasiveness among the proficient NNE research readers towards NE and NNE research abstracts with different categories of Analytical Thinking (AT) and Emotional Tone (ET). The different categories (Standardized, High, and Low) of AT and ET in RAs were determined based on the standardized scores of these psycholinguistic domains in native and non-native English research abstracts reported by previous studies [2]-[3]. Therefore, there was no content manipulation of the research abstracts, but merely the re-assignments of RAs into the identified categories. Instead, only the AT and ET values and several other specific criteria (e.g., topics of RAs on Education, English and Linguistics, the word limits of the RAs, the RAs of research papers published within a specific period of 6 years), based on the criterion method of RAs sampling, were used as main references in the selection of the RAs to be later read and rated by the respondents. In this regard, the selected RAs constituted the naturally occurring type of data in the present research.

3.2   Instrumentation

Persuasive Discourse Inventory (PDI) questionnaire was chosen as the primary data collection tool in the present research because it was theoretically built upon Aristotelian modes of persuasion. The two modes of persuasion, *Logos* and *Pathos,* are aligned with the LIWC2015 Analytical Thinking and Emotional Tone domains, respectively. Persuasive Discourse Inventory (PDI) was developed by [24] to be used to measure the persuasiveness of any advertisements or promotional tools in terms of their appeal of Aristotelian *Logos*, *Ethos*, and *Pathos*. In communication and persuasion, the PDI was originally used to assess the persuasiveness elements of any promotional texts in terms of the texts' logical, credibility, and emotional elements of persuasion. Due to the specific focus of the research on *Logos* and *Pathos*, the adapted version of the PDI was used by only maintaining the sub-scales for logical and emotional modes of persuasion. This adapted version contained the 5-Likert option scale by offering the interval measurement scale from the lowest to the highest options. The sub-scales for *Logos* and *Pathos* have the following statements for the respondents to choose from "Strongly Disagree" (1 point) to "Strongly Agree" (5 points) based on the presented RAs.

Table 1: A *Logos* Subscale of 5 Statements and A *Pathos* Subscale of 7 Statements

No.	Sub-scale for *Logos*	Subscale for *Pathos*
1.	It is rational.	It affects my feelings.

2.	It is informative.	It touches me emotionally.
3.	It deals with facts.	It is stimulating.
4.	It is knowledgeable.	It reaches out to me.
5.	It is logical	It is stirring.
6.	-	It is moving.
7.	-	It is exciting.

It is important for any questionnaire to establish the validity and reliability tests before it can be used for other population samples. According to [10], the PDI inventory was considerably given the validity and reliability tests for the entire scale and sub-scales. The validity and reliability tests were conducted to the original version of the PDI with 7-bipolar Likert scale of measurement. A group of 16 advertisements used as the stimuli for a group of respondents to rate their persuasiveness levels and the correlations coefficients were generated for each type of appeals (items of L1-L5 for *Logos*, items of E1-E5 for *Ethos*, and items of P1-P7 for *Pathos*). The validity of the PDI as a questionnaire instrument was established based on the results for inter-item correlation coefficients which demonstrated moderate to strong levels of correlation from the scores of .63 to .91. Apart from the validity test, the other measure that was postulated to assess the robustness of a questionnaire as a tool of measurement was the reliability test. The reliability of the PDI questionnaire was tested by [24] based on a similar set of data by determining the reliability coefficient scores. It was concluded that the reliability of the 16 stimuli for the *Logos* as a sub-scale of the instrument were strong with .86 in which all the obtained scores ranged from .50 to the perfect correlation coefficient score of 1.00. The same reliability test was done to the *Ethos* as another sub-scale of the instrument in which the correlation coefficient was stronger with .90 from the score range of .61 to 1.00. Finally, the reliability was also confirmed with *Pathos* as the third subscale of PDI instrument with a strong correlation coefficient of .82 from the score range of .59 to 1.00. Based on the above-mentioned report of validity and reliability test results, it was concluded by Feltham [10] that the PDI as an inventory has established the validity and reliability tests across various types of stimuli and situations. The PDI can be used as an instrument to assess the perceptions of persuasiveness towards other types of texts or stimuli written with different rhetorical modes of persuasion.

3.3   Data Collection

As mentioned briefly earlier, this research employed a survey questionnaire with an interval measurement scale. Each response to the statement given by the respondents could be quantified from 1 to 5 points from the "strongly disagree" response to the "strongly agree" response. Therefore, the total PDI scores of persuasiveness for five (5) statements of logical appeals (*Logos*) of the RA would give a minimum score of 5 to a maximum score of 25 points per RA. Meanwhile, the total PDI scores of persuasiveness for seven (7) statements of emotional appeals (*Pathos*) would give a minimum score range of 7 points to a maximum score of 35 points per RA.

The first part of the respondents' ratings involved two NE RAs and followed by another two NNE RAs in which the data would be further used and analyzed to address RQ1. Both groups of NE and NNE RAs had their standardized values of Analytical Thinking (AT) and Emotional Tone for native and non-native writers, respectively, based on the preliminary score analysis of 480 research abstracts reported in a previous study [2]. Meanwhile, the second part of the respondents' ratings involved two more NNE RAs followed by another two more NE RAs in which the data would be further used and analyzed to address RQ2. The first RAs of the two NE RAs and two NNE RAs had High Analytical Thinking (HAT) values but Low Emotional Tone (LET) values. Meanwhile, the second RAs of the two NE RAs and two NNE RAs had the Low values of Analytical Thinking (LAT) but High values of Emotional Tone (HET).

Thus, for the data collection of RQ1, the PDI scale was administered to the same group of 120 respondents two times in the same survey. They were first asked to rate the RAs with English nativeness of Analytical Thinking on the first PDI scale. Afterward, they were then asked to rate the RAs with English non-nativeness of Analytical Thinking and Emotional Tone on the next PDI scale. Thus, each RA was presented alternately with the PDI scale. As for the data collection of RQ2, the same method of survey administration was repeated in which the same group of 120 respondents were asked to rate two different groups of RAs. They were first asked to rate the RAs with High Analytical Thinking (HAT) but Low Emotional Tone (LET) on the PDI scale. Afterwards, they were asked to rate the RAs with Low Analytical Thinking (LAT) but High Emotional Tone (HET) on the next PDI scale presented alternately one after another with the next RA. In total, four RAs and PDI scales were administered to collect data for RQ1, and four RAS and PDI scales were administered to collect data for RQ2.

3.4   Data Analysis

In the first-part data collection, since the same group of respondents was asked to respond to two different sets of stimuli (two NE RAs, followed by two NNE RAs), a repeated measure Sample t-test would be used to analyze the data to see if both sets of data showed significant differences. Eventually, the findings would help conclude if the first group of NE RAs would be more persuasive than the second group of NNE RAs or if the findings would show the opposite trend of persuasiveness. The second-part data collection applied the same method but with different sets of stimuli (two RAs with HAT but LET, followed by two RAs with LAT but HET), thus a repeated measure sample t-test would also be used to analyze the data to see if both sets of data showed significant differences. The findings would help conclude if the first group of RAs would be perceived to be more persuasive than the second group of RAs or if the findings would show the opposite pattern. Eventually, the findings from both analyses would help the researcher to later conclude if the English nativeness types and the different degrees of English non-nativeness of Analytical Thinking and Emotional Tone would be perceived by readers as essential or inessential in persuasive writing of academic research papers.

4   Results and Discussion

In this section, the reports are presented on the contrastive analyses of the PDI persuasiveness scores rated by 120 respondent readers towards NE and NNE types of research abstracts with standardized, high, and low levels of Analytical Thinking and Emotional Tone. Repeated measure t-tests were used in the two research questions' data analyses as this survey only involved one group of target reader respondents.

4.1   Results

The first question was constructed to examine if Malaysian readers showed significant differences in their perceptions of persuasiveness towards NE and NNE research abstracts presented with Standardized Analytical Thinking and Emotional Tone. The research question aimed to examine the English nativeness of research abstracts would be perceived differently by the readers from the English non-nativeness. Thus, the analysis involved comparisons of the PDI scores of NE and NNE RAs presented with Standardized Analytical Thinking and Emotional Tone.

Differences of Persuasiveness Scores Between NNE and NE RAs with Standardized Levels of Analytical Thinking and Emotional Tone

As can be seen, the following table shows the results of repeated measure t-test on the PDI scores of the NE RAs against the PDI scores of the NE RAs.

Table 2: Results of Repeated Sample Measure t-Test on the Differences of Total Persuasiveness Scores of NE RAs against NNE RAs with Standardized Analytical Thinking and Emotional Tone

Types of RAs		M	SD	t	df	p	Cohen's d
NE & NNE RAs with **Standardized** Analytical Thinking and Emotional Tone	PDI Scores of **NE RAs**	84.26	10.7	5.95	119	.001	.541
	PDI Scores of **NNE RAs**	90.03	12.4				

Table 2 compares the PDI scores between NNE RAs and NE RAs with the standardized values of Analytical Thinking and Emotional Tone. The respondents gave higher persuasiveness scores towards the NNE RAs (M = 90.03, SD = 12.4) than (M = 84.26, SD = 10.7). The differences between these two persuasiveness scores were also significant, $t(119) = 5.95$, p < .001. The analyzed effect size ($d = .541$) also fell within the moderate range of Cohen's [31] convention. Thus, it can be

concluded that the readers perceived NNE RAs as more persuasive than NE RAs regarding the overall persuasiveness of the standardized usage of Analytical Thinking and Emotional Tone. Most importantly, this finding helped the researcher further conclude that English nativeness (also implying the near-nativeness) of academic research writing may not be essential in creating the persuasiveness of academic writing to ESL readers.

Differences of Persuasiveness Scores Between Two Groups of RAs with Different Levels of Analytical Thinking (AT) and Emotional Tone (ET)

Further analysis was conducted on the persuasive scores between RAs with High Analytical Thinking (HAT) but Low Emotional Tone (LET) and RAs with Low Analytical Thinking (LAT) and High Emotional Tone (HAT). It is essential to highlight that the label of "High" AT or ET herein implies an over usage of AT or ET and the label of "Low" AT or ET implies an under usage of AT or ET. The analysis was done to answer the second research question - if ESL readers would show significant differences in their perceptions of the persuasiveness of these two groups of RAs. To answer this research question, the differences in the types of research abstracts, either drawn from NE or NNE, were not the focus of the research as it has been addressed in the first RQ1. Instead, this RQ examined whether research abstracts with High Analytical Thinking, but Low Emotional Tone would be rated more persuasive than the RAs with Low Analytical Thinking but Low Emotional Tone or otherwise.

Therefore, the following table shows a contrastive analysis of PDI scores between RAs with High Analytical Thinking, but Low Analytical Thinking (LAT) and RAs with Low Analytical Thinking, but High Analytical Thinking (LAT).

Table 3: Results of Repeated Sample Measure t-Test of Persuasiveness Scores between Two Groups of RAs with Opposite Categories of Analytical Thinking and Emotional Tone

Types of RAs		M	SD	*t*	*df*	*p*	Cohen's *d*
RAs with **Opposite** Categories of Analytical Thinking (AT) and Emotional Tone (ET)	RAs with **HAT** but **LET**	88.42	12.32	4.24	119	.001	.386
	RAs with **LAT** but **HET**	84.12	14.33				

As can be seen in Table 3, it shows the results of repeated sample measure t-test on the differences of PDI persuasiveness scores between RAs with High Analytical Thinking (HAT), but Low Emotional Tone (LET) and RAs with Low Analytical Thinking (LAT), but High Emotional Tone (HET). The respondents gave greater persuasiveness scores for RAs with HAT but LET (M = 88.42, SD = 12.32) than RAs with LET but HET (M = 84.12, SD = 14.33). The difference of the two PDI scores was also significant, $t(119) = 4.24$, p < .001. The effect size ($d = .386$) fell within the

small range of Cohen's [31] convention. It can be interpreted from the finding that RAs presented with an over usage of Analytical Thinking, but an under-usage of Emotional Tone were perceived by ESL readers as more persuasive than RAs written with an under usage of Analytical Thinking but an over usage of Emotional Tone. Most importantly, apart from confirming the previous analysis on the persuasiveness of English non-nativeness and the non-essentiality of native English to ESL readers in the rhetoric of academic writing, this finding helped the researcher further conclude that academic writing composed with an over usage of lexical items related to Emotional Tone was not able to produce the intended effects of appealing to the emotions of academic readers.

4.2   Discussion

The theory of rhetoric and the logical and emotional modes of persuasion were used in many studies to see if these persuasion modes can be measured in the responses given by the target audience [13]. It was used in previous studies as a tool of research instrumentation to explore the psyche of the intended readership in terms of their readers' choice of words concerning the psycholinguistic domains [24]-[12]. In the present research, logical and emotional appeals in the choice of words used in research abstracts were evaluated based on the readers' persuasiveness. Salih [25] stated in their study that Malaysian ESL readers perceived logical and emotional appeals as the most challenging persuasion modes to employ in their persuasive texts due to the subjective nature of these appeals to the eyes of native and non-native audiences. The argument was explored in the present research when various categories of appeals in the writers' choice of words in composing research abstracts were presented to the research readers.

Based on the present research findings, the English non-nativeness in the rhetoric of academic research abstracts was more persuasive to ESL readers than the English nativeness. This also implies the non-essentiality of English nativeness to ESL readers in academic research writing. This conclusion, however, contradicts the argument by [29] and [30] that the native English style of writing a research article was an essential element to be adopted by non-native English writers because the element would make their writing more persuasively visible than the non-native style of writing. In a study of 48 research articles sampled from two journals: non-native English writers' Second Language writing of English research articles (RAs) and native English writers' Journal of Assessing Writing, [29] found that the visibility of non-native English writers was shown to be inferior to that of native English writers in many attempts of research publications. They attributed the lack of visibility of the ESL writing to their English non-native rhetoric in composing their research work.

To elaborate further on the persuasiveness findings of English non-nativeness through the analytical Thinking and emotional tone, the present study found that the persuasiveness of English non-nativeness to ESL readers was demonstrated through an over usage of writing elements related to analytical Thinking and logical appeals. [27] supported the study, depicting that Malaysian NNE postgraduate writers were prone to use complex types of language as they perceived it to be the strategic way to

create logical appeals in the audience's mind. On top of the above, the persuasiveness of English non-native rhetoric could be accompanied by an under-usage of writing elements related to the emotional tone and emotional appeals. In simpler terms, for ESL writers to be persuasive to ESL readers, they were recommended to show shallow usage of emotive choice of words in their academic writing. This finding contradicted the trend shown in previous studies by [21], [22], [18], and [19] on the non-native English writers' style of academic writing with emotion-loaded choice of words as a rhetorical means to influence the people's perceptions and emotions towards a specific discourse. Contrary to popular belief among ESL writers, this writing pattern was apparently not the best rhetorical strategy to appeal to people's emotions. This form of positivity bias, as proposed by [20], through the over usage of emotion-oriented writing would most likely be impressive and persuasive in other genres of writing but not the genre of academic research. If this mismatch continues to be applied by ESL research writers to create an impression purposely, the present and previous studies showed that they would probably produce an academic research writing that was not only non-native but also non-persuasive to their ESL readers. Future research may be conducted to validate further if native English readers, like ESL readers, may have the same perceptions of persuasiveness towards this native and non-native rhetoric in academic research writing.

5   Conclusion

It can be concluded that the ESL readers' perceptions of the persuasiveness of non-native English rhetoric through an over usage of logical appeals and an under usage of emotional appeals in academic research writing could be explained from the cultural perspective, especially on the influence of ESL writers' cultural style of writing as shown in the contrastive studies by [1] and [2]. They discovered that ESL academic writers demonstrated excessive mediation and influence of their first language. Despite many years of addressing this issue by academics, it shows that the idea of culture continuously causing ESL writers' non-nativeness in English may have yet to show any relief in some segments of ESL writers in the oriental regions. By extension, it seems to have also affected their perceptions of the unnecessary consideration of native English rhetoric in their academic research texts, thus culturally putting them in blissful unawareness and their non-native bubble of biasedness. This cultural explanation can be an area of further consideration by future researchers. Finally, ESL teachers of academic writing for research purposes may want to emphasize the importance of English nativeness or English near-nativeness to ESL academic research writers in their teaching instructions to increase the visibility and acceptance of their research papers in the international context.

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