

## Engagement Patterns in Engineering Academic Writing

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### **Abstract:**

In this study, the Heteroglossic-Engagement patterns are identified in 20MRAs written in English by Iraqi academic researchers and published in Engineering and technology journal which issued in the University of Technology. The study aims at exploring the construal of Engagement in academic writing. In doing so, a comprehensive manual analysis has been done by using Engagement subsystem of Martin and White (2005) appraisal framework. The study investigates how the academic researchers can manipulate Heteroglossic patterns to engage with the alternative voices in the text in order to discuss, challenge, or advocate these studies. The findings show the predominant of Contractive patterns compared with the Expansive patterns. The study avoids generalization and recommends a large corpus study to indicate more linguistic variation.

**Key words:** MRA, Engagement, Heteroglossic, Engagement, Contractive patterns, Expansive writing.

## أنماط المشاركة في الكتابة الأكاديمية الهندسية

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### الخلاصة :

في هذه الدراسة ، تم التعرف على أنماط التشارك بين الباحثين في صياغة الألفاظ اللغوية في ٢٠ مقالة علمية تم كتابتها باللغة الإنجليزية من قبل الباحثين العراقيين ونشرت في مجلة الهندسة والتكنولوجيا التي تصدر في الجامعة التكنولوجية. تهدف الدراسة إلى استكشاف مفهوم المشاركة في الصياغة اللغوية في الكتابة العلمية بين الدراسة الحالية للكاتب والدراسات السابقة التي اعتمد عليها ولتحقيق هذا الغرض تم اجراء تحليل لغوي شامل للمقالات المختارة باستخدام نظرية (Martin and White (2005، حيث يتم التركيز في هذه الدراسة على إمكانية الباحثين استخدام أنماط التشارك للتفاعل مع الباحثين السابقين المذكورين في النص من أجل المناقشة والتحدي أو تأييدهم الدراسات. هذه الدراسة تتجنب التعميم وتوصي بدراسة مجموعة كبيرة للإشارة إلى مزيد من الاختلاف اللغوي.

الكلمات المفتاحية : أنماط التشارك ، التقليل في الكتابة ، التوسع في الكتابة .

## 1. Introduction

Stance as defined in the "Concise Oxford Dictionary (eighth edition, 1990)" is "a standpoint; an attitude of mind." This meaning was accepted by the linguistics and interactional researches where the stance has often been assumed to "a subjective attitude or else position that comes from the speaker's interior mental position, aim, as well as belief" (Haddington, 2005, p.15).

Stance is a wide and interested scholarly topic of investigation in various disciplines such as Linguistics, Sociology, and Anthropology. Over the past few decades, a rapid tendency in the worldwide research has been raised to investigate stance as an important linguistic phenomenon. These studies included all field of knowledge such as "multiple book publications, conference panels, and special journal issues devoted to the topic" (Englebreston, 2007, p.1).

Englebreston described stance in his book "Stance Taking in Discourse" as a "messy endeavor." He stated that scholars have used many terms to refer to stance, such as evaluation, subjectivity, and appraisal. Stance is not merely determined by "single linguistic markers," but it is indexed by all the combinations of linguistic features including "evaluative adjectives and nouns, modals, adverbial modals, and so on" (ibid, p.17).

Eventually, many theoretical contributions and models have emerged to study stance in discourse both oral and written, Biber (2006) for example restrictedly refer to stance as a class of grammatical items. He identified stance adverbs like certainly, surprisingly, generally...etc., stance verbs like appear, expect, hope, worry...etc., and others. Additionally, he used the term "Patterns of stance" to emphasize the ability of stance in conveying different aspects of personal feelings, attitude toward certain information, and their own perspectives (Issac, 2012, p.11).

Respectively, in their model ;Biber & Finegan 1988, 1989; Biber et al. 1999; Conrad & Biber 2000, have assumed their own "functional perspective", without referring to the Interpersonal metafunction of language in the Hallidayan notion of SFL. In their model, they distinguish six major types of functions or as they have called tasks "ideational, textual, personal, interpersonal, contextual, and aesthetic." According to the model, the stance falls in 'Personal tasks' class that connect the communicating of attitude, thought, along with the speaker's feeling. In their viewpoint, the patterns of stance are overtly lexicogrammatical, and are identified by grammatical and paralinguistic devices, and word choice without referring to the mechanisms of communication (Jullain, 2008, p.63).

Du Bios (2001) assembles an analytic toolkit for "stance triangle," which posits stance to represent three kinds of act in one, instead of three dissimilar kinds. For Du Bois, evaluating, taking a position, as well as alignment exemplify diverse features of the similar stance act. In other words, take a stance refers to "(1) to evaluate an object, (2) to position a subject (frequently the self), as well as (3) to align along with another subject"(Engelberston, 2007, p.163).

Similar to Biber, Hyland (2005) defined stance to be, the techniques academics explain their text to make a comment about the possible accurateness or creditability for a claim. In other words, the scope those academics desire to obligate to it, or the attitude they need to take to entities, propositions, otherwise the readers. He sketched out stance along with its a number

of properties with functions obviously in his "Model of Interaction in Academic Discourse." Hyland in his model defined four elements of stance; Hedges, Boosters, Attitudinal Markers, and Self-mentions. He referred to stance as "textual voice," represented by the ways used by researchers to select and deploy linguistic patterns to present themselves, their positions, and their readers (Hyland, 2008, p.6).

Finally, the Appraisal Theory (Martin, 2000; Martin & White, 2005; Martin & Rose, 2007) documented the elements by which stance processes are negotiated, and classified. In addition, it provides a description of how these elements function in real language situation. Appraisal system (Martin & White, 2005), consists of three subsystems and their categories and subcategories. Attitude includes dissimilar choices to express positive or negative evaluating; Engagement deals with options to expand and contract space for other voices, and Graduation adjusts the attitude and Engagement in terms of strength and weakness.

The Engagement subsystem of Appraisal, the theoretical framework of this study encompasses all the linguistic patterns of Heteroglossic and monoglossic moods. The Heteroglossic patterns help to adopt Engagement by allowing the listener/reader aligns (to align ) with the value positions of the speaker/writer. Particularly, they deal with the extent to which the Author voice involves with alternate perspectives, thoughts, and values.

Heteroglossic patterns are (multi-voiced), where the possibilities of communicate dialogically is acknowledged. These possibilities could work for closing down dialogue via: refusing other position disclaims, "It isn't the world's end." Extremely Certifying a position to the degree that different possibilities can be intimidated proclaim "obviously, it has been proven that.....", or it can expand dialogic potential by opening a variety of possibilities include "perhaps", explicitly recognizing other voices attribute "as stated by Brown; Smith states; Jones 2004; it is claimed that"(Martin & White, 2005, p92-135).

## 2. Research Questions and Objectives:

Due to the limited research interest in the area of written genres in general and the studying of Engagement in particular in the national level. The current study main objective is to investigate the ability of Iraqi academic researchers in deploying the patterns of Engagement in their articles as they engaged dialogically with the alternative voices in the text. Accordingly, to achieve the aforementioned objectives this work attempts to find answers for the questions below:

Q1-What are the Engagement patterns that allow the construal of Engagement in (IMRD) rhetorical sections of the RA written in English by Iraqi researchers?

Q2- Do Iraqi academic researchers tend to use Contractive or Expansive patterns of Engagement in their writing?

## 3. The Significance of the Study

This study seeks to understand how Iraqi academic researchers are able to align or disalign with valued stance in the written context. More accurately, how the authorial voice choices of Engagement patterns in the text help to address other voices in the text and engage with them. The

linguistic significance of this study lies in being able to pinpoint the important of Engagement patterns in published scientific articles as indications of Engagement. It offers additional insights into the characteristic of scientific writing by analyzing the distinctive aspects of stance patterns of scientific language.

The study would provide hopefully intuitive insights into the knowledge of Engagement as means of stance in scientific discourse among Iraqi academic researchers based on their ability to appropriately use or not use these patterns. Consequently, the study has an educational significance in that it might be very helpful to the faculties' instructors to encourage their students i.e. novice researchers to consider certain linguistic patterns in their writing, hence to allow interaction and make knowledge transmission more feasible, in return to be more skillful in subtly introducing the scientific studies. This may probably raise the awareness of those novice researchers to adopt appropriate Engagement in their writing since it proved to be one of the characteristics of good writing. Therefore, to anticipate their publications in the future acknowledged nationally and internationally.

#### 4. Methodology and Procedure of Analysis

To achieve the purpose of the study a total of (20) MRAs published during the years 2018-2019 were selected from Engineering and Technology Journal issued by University of Technology-Iraq. The published articles are belonging to various engineering disciplines. The data of MRAs analyzed by adopting the Engagement subsystem of Appraisal, which offers an important theoretical framework to analyze the linguistic constructions of Engagement in the scientific texts (Fig.1). The analysis combines both quantitative and qualitative methods. The quantitative data comprises the frequency and percentage of Engagement patterns in the articles in four rhetorical sections, the introductions, methods, results, and discussions (IMRD). The qualitative analysis is conducted as a complement to the quantitative analysis to interpret the linguistic realizations of the Engagement patterns through the text from the most general Heteroglossic categories to the most specific subcategories in the model.

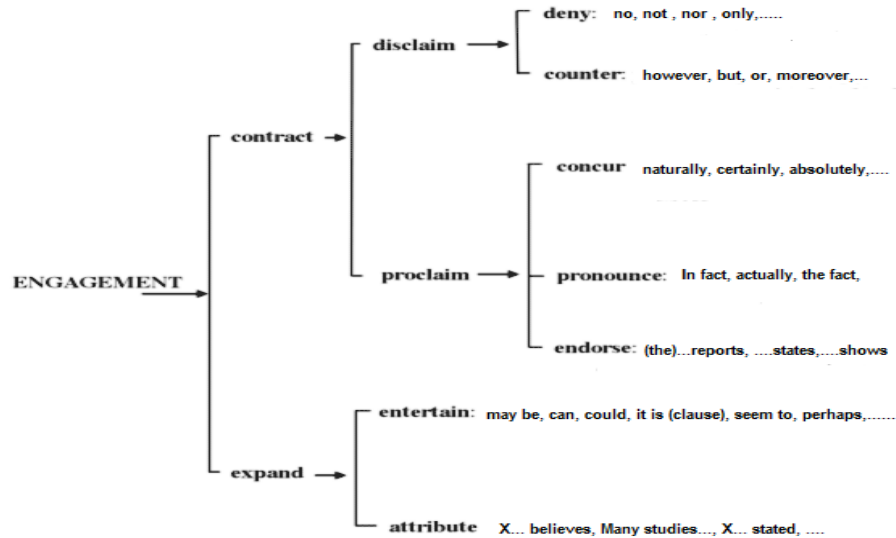


Figure1. The Engagement subsystem adapted from Appraisal (Martin &White, 2005,p.134)

The procedure of data analysis in this study comprises many steps started by collecting MRAs the journal in PDF format. The second steps is converting these PDFs into docs in order to exclude the tables, figures, footnotes ...and other sections that don't belong to the rhetorical sections IMRD of the article.

The number of words in the rhetorical sections, percents,and the total numberof MRAs present in(Table 1).This will be helpful later in identifying the frequency of Heteroglossicpatternsper sections.

Table 1. Words distribution and percentsin the rhetorical sections in NSand NNS MRAs.

Rh. Sections	Introductions	Methods	Results	Discussions	Total
Raw	3844	1523	2404	3785	11556
Percentage	33.26	13.18	20.80	32.75	100

#### 4.1 Coding EngagementPatterns

The first step of analysis is coding Heteroglossicpatterns, each documented group of rhetorical section splitted and collected in the previous stepsare read manually. Figure (2) clearly shows the scheme of Engagement:Heteroglossic coding from the very general to the most specific subcategory to be followed in the texts' analysis process.The first code is the Contratctive category which allow the writer to close downthe dialogic space, then the Expansion caregory which opens up the dialogic space. In other words, the analysis started from the very general by focusing on the

main categories of Contraction and Expansion to the most specific one which included the subcategories of denial, counter, acknowledge, ... and alike.

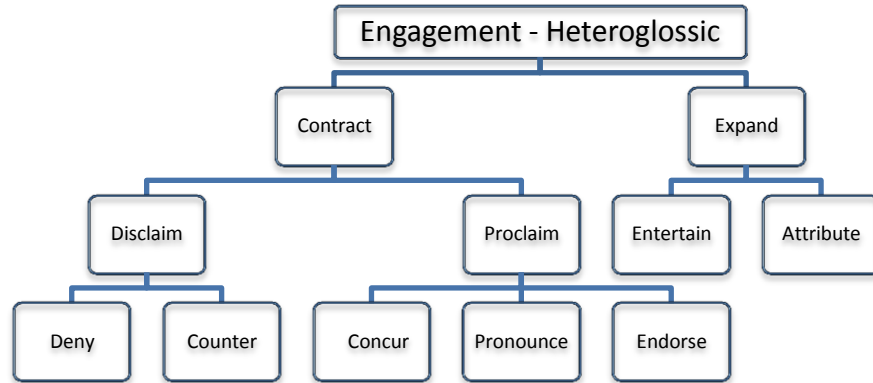


Figure 2. The scheme of Engagement analysis.

#### 4.2 Examples of Engagement Patterns Occurrence in the MRAs

The following table (2) shows patterns of the Engagement: Heteroglossic patterns frequency in the MRAs and their linguistic realizations:

Table(2) Patterns of Engagement in the MRAs of academic researchers

Extract	Key words	Engagement Categories
So, this sample may be an appropriate material used for maxillofacial prosthetic applications(Introduction,p.121,2019)	may be	Expand: Entertain
If the requirements for all three characteristics are fulfilled, mix can be classified as SCC as reported by Al-Jabiry.(Introduction, p.111,2018)	If	Expand: Entertain
However, there is no study has been reported on how the Q-point can be control based on the transient response for the DFB lasers. Therefore, this study will provide important and useful information, especially regarding laser design.	reported	Contract: Proclaim: Endorse
However, it is difficult to use this technique to determine the strength of concrete made of	However	Contract: Disclaim: Counter

different materials with unknown mixing ratios(Introduction,p.117,2018)		
During solidification, the eutectic carbides are formed, and they do not undergo a further transformation, but the matrix can be altered (Introduction,p.112, 2019).	do not	Contract: Deny
For controlling the Q-point in DFB lasers, we proposed a new methodology (Methodology,p.148,2019)	we	Contract: Concur

5.The study results

The main objective of this study is to examine the ability of Iraqiacademic researchers to construe Engagementresources in their writing. By adopting Engagement patterns, the authorial voice can observe, discuss, challenge, and converse alternative voices. In this section the frequency per 1000of the Heteroglossicpatterns in the IMRD of 20 MRAs written by Iraqi academic researchersare calculated. Heteroglossicpatterns are presented to show how the researcher construesEngagement by means of Contractive and Expansionpatterns.

Table (3) outlines the frequency per 1000 of Heteroglossic patterns in the MRAs rhetorical sections. It is obvious that the researchers use Expand: Entertain in the top of the other resources (142.89) per 1000 with the highest frequency among other patterns in the discussions (57.10) per 1000, followed by Contract: Counter (139.52) and Expand: Attribute (126.15).

Rhetorical section	Heteroglossic													
	Contract										Expand			
	Disclaim				Proclaim						Attribute		Entertain	
	Deny		Counter		Concur		Pronounce		Endorse					
	Ra w	Per 1000	Ra w	Per 1000	Ra w	Per 1000	Ra w	Per 1000	Ra w	Per 1000	Ra w	Per 1000	Ra w	Per 1000
Introduction 8541	65	7.61	11	13.00	56	6.56	29	3.40	18	2.11	13	15.22	16	18.97
Method 4421	10	24.43	18	42.07	11	26.24	8	1.81	12	2.71	12	29.18	15	34.16



Results 4531	15 4	33.9 9	16 2	35.7 5	45	10.8 1	18	3.09	12	2.65	12 8	28.2 5	14 8	32.6 6
Discussions 5832	18 2	31.2 1	28 4	48.7 0	19 0	33.4 4	45	6.86	24	4.12	31 2	53.5 0	33 3	57.1 0
Total 23325	49 9	97.2 3	74 3	139. 52	41 6	77.0 5	91	15.1 5	66	11.5 9	69 9	126. 15	79 4	142. 89

Entertain patterns are used by the academic researchers to represent the authorial voice proposition as one of other alternative positions. Common patterns of Entertain in the MRAs are mainly modal auxiliaries " Will, May, Can,etc." and "Probability" as in the following example:

A choice of the ideal test may be difficult, and the selection is related to the doctor to determine the best method to make sure that the most effective technique is used (Introduction,p.166,2019).

The two Expand categories Entertain and Attribute occupied the highest frequency among other patterns of Engagement. By expand the dialogic space; academic researchers tend to open up other viewpoints and different prior external voices' in the texts.

The study by one of the scientists of psychology De Paulo [1] showed when people are lying their behavior is different if they telling the truth, his study involve 1338 participants and he was able to identified 158 indicators (Introduction,p.90).

Theacademic researchers opening up the dialogic space by using show which indicates Attribute – Acknowledged. Attribute is of two subcategories ( acknowledgement and distance), here the authorial voice expresses a neutral standpoint. In other words the academic researchers "disassociate the proposition from the text's internal authorial voice by attributing it to some external sources" (Zhang&Liu,2015,p.10)

## 7. Discussion

The main objectives of this study are to examine Iraqiacademicresearchers ability to deploy Engagement in their writing, and to show which category patterns are predominant Contract or Expand patterns.The results in general indicated thatContractive patterns are used more than Expansive patterns.The same results are confirmed by Pascual, and Unger (2010) who indicated the predominant of Engagementpatterns, and asserted the importance of using Interpersonalpatterns in writing since they help authors to position themselvesand align their audiences (Pascual &Unger,2010,p.261).

In the same vein, Fryer (2013) findings show a significantvariation in the types of Engagementpatterns used by academicresearchers in addition to their distribution "across and within different sections of the academic research article" (Fryer,2013,p.183 ).Breivega, Dahl and

Flottum (2002), in examining medical articles found that they are "non-expressive researchers who do not let other researchers be heard in their texts" (Fryer,2013,p.184). This study examined author presence, stance, self-promotion,and the manifestation of other researchers' voices" by comparing three disciplines includingmedicine.

Finally, the results of the study indicate the absense of the frequency of the Attribute: Distance and Concur: Concede patterns. The same also found in Fryer (2013) study. Fryer in annotating the Engagement patterns of MRAs written NS admitted that no instances of Distance and Concede are shown in his corpus (p.197).

## 8. Conclusion and recommendations

This study outlines the preliminary important patterns of HeteroglossicEngagement. The aim is to explore how Iraqiacademicresearchers can construct Engagementin their writings. The study employsMartin and White (2005) model of Appraisal Theory, precisely the Engagement subsystem.

The finding of thepresent study has demonstrated that there are substantial management of Contractive patterns in the researchers writing. There is therefore a high correlation between using Heteroglossic resources and the quality of academic wring. These results reveal that an effective MRA is one which is considered as multi-voiced in nature and which conveys its evaluation by employing many options of Hetroglossic patterns either by close down or by open up the possibilities of external voices to engage with the reader and construct an authoritative voice.

The findings presented a variety of HeteroglossicEngagementpatterns across the rhetorical sections IMRD of the MRAs ofboth NS and NNS academicresearchers. The study also show predominant ofContractive patternscomparedwith the Expansive patterns, which means that academicresearcher "acts to challenge, fend off or restrict the scope" of alternative positions (Martin and White 2005: 102). In other words, acts to defend his proposition and invite others to share the own ideas.

However , the results can not generalize since the study examinesa limited number of articles. Actually, patterns of Heteroglossic might be easily recognized by using corpora than by the analysis "of individual texts or text segments alone" (Fryer,2013,p.201). Subsequently, to explore the effect of of the variation of hetroglossic Engagement in the academic articles and their linguistic realizations.

Finally, It is hoped that this study has contributed in developing understanding of construction authorial` stance in academic writing. It might encouraged instructors especially those in the field of science to explore the development of writing ability more fully,and to stress that in order to persuade readers, besides needs being coherent it is important foracademicresearcher to deploy heteroglossic patterns through the writing process.

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