The Construction of Stance and Authorial Voice in Medical Texts Written by Professional Scholars

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Abstract

The focus of the present study is on how professional scholars argue their propositions while maintaining a relationship of solidarity with their readers in the discussion section of medical research articles. More specifically, it provides explanations of (1) how attitude features of effect, judgment, and appreciation are disseminated across academic medical texts published in reputable journals, (2) how different writer voices are constructed through the use of evaluative language, and (3) the assumptions that professional published writers make about the values and beliefs of their readers. Mackey and Gass (2005) Appraisal theory was employed in the present study because it focuses on interpersonal meanings that provide writers and speakers with the means to be critical, value, reject, accept, and challenge other positions. The findings revealed high instances of Appraisal resources in the discussion section of the medical texts. Thus, language played an important role and was used rhetorically to achieve argumentative goals. The interpersonal language was highly achieved through resources of engagement. The study contributes new understandings of interpersonal meaning in the professional writers' medical texts from the functional perspective of Appraisal theory. The findings may provide new directions for the development of literacy in the genre of academic research writing.
Keywords: Appraisal theory; Stance; Authorial voice; Attitude features; Medical research articles; Professional writers.

1. Introduction

Academic writing is an interactive process of building knowledge to persuade readers of a writer's claims. Academic writing is interactive in the sense that the meaning is negotiated between the writer and the reader according to the linguistic conventions specific to that discourse community. Mackey and Gass (2005), argued that writers need to draw on interpersonal meanings for their writing to be appealing to their readers. Interpersonal meaning is one of the three metafunctions of meaning under the theory of Systemic Functional Linguistics (hereafter SFL) that considers language a process of meaning-making, in other words, a social semiotic (Halliday, 1978). Interpersonal meaning refers to how relationships are made through language and the role of the participants involved in a communicative event (i.e. writer/reader and speaker/listener). It explores an author's voice or stance; authorial voice or stance refers to how writers position themselves and their readers in the text. It also focuses on a writer's evaluation of a proposition. Evaluation is a broad term that covers a writer's or speaker's emotion, attitude, stance (or engagement), opinion, and judgement of the propositions or external sources they are discussing in the text.

Moreover, Hood (2004) argued that constructing a publishable text in one's mother tongue is not always an easy task, and it is even more challenging to write research in a foreign language. Therefore, producing sound research articles (RAs) is a challenge for non-native speakers of English. Wette (2018), stated that learning to write scientific articles is not just about having the knowledge and skill in grammar but also the ability to successfully construct stylistically appropriate research texts. From a linguistic point of view, professional researchers are required to

engage with knowledge and to take on various roles when constructing texts. In academic research, professional writers are encouraged to have a more critical perspective, establish a stance, and have a wide range of rhetorical techniques available to them. For researchers, mastering such skills has become crucial for publishing in international influential journals. Furthermore, Prior research suggests that speakers of English as a foreign language find it difficult to interpret and establish a stance in their writing (Flowerdew and Li, 2007).

Therefore, the focus of the current research is on how experts and professional scholars represent and construct information in the discussion section of medical RAs. A particular aim is to explore how critical professional scholars were when they argued their propositions. Martin and White (2005) SFL-based Appraisal theory was employed in the present study because it focuses on interpersonal meanings that provide writers and speakers with the means to be critical, value, reject, accept, and challenge other positions. The study attempted to answer the following three research questions:

- What features of attitude (affect, judgment, and appreciation) are disseminated in the discussion section of medical research articles written by professional published writers?
- How are different authorial voices constructed through the use of evaluative language by professional published writers?
- What are the assumptions that professional writers make about the values and beliefs of their putative audience?

2. Literature Review

There are relatively very few studies (Alramadan, 2020; Cheng and Unsworth, 2016; Fryer, 2013; Hood, 2004; Loi *et al.*, 2016; Poole *et al.*, 2019; Swayer and Eesa, 2019; Xiaoyu, 2017; Zhang and Cheung, 2018) in the literature that have employed Martin and White (2005) Appraisal framework to explore the construction of stance and/or authorial voice in published RAs, though most of these studies investigated cross-cultural variations in the use of these interpersonal aspects.

For instance, Swayer and Eesa (2019) explored the Appraisal resources in entire medical RAs produced by native speakers of English and Iraqi writers. The findings indicated that (resources of judgement i.e., social esteem and social sanction) within the subsystem of attitude were the most dominant in both sets of data. Heteroglossic propositions of contract and expansion were more frequent in the data as compared to monoglots ones. The researchers neither investigated the deployment of evaluative resources within different sections of the medical RAs nor did they explain why the resources of judgement were the most frequent attitudinal resources. In the same line, Fryer (2013) investigated engagement and intersubjective positioning in 23 medical RAs written by professional writers. Fryer (2013), reported that the majority of the engagement features were dialogically expansive. The introduction and discussion sections were more heteroglossia as compared to the methods and results sections. Also, he added that entertain was the most frequently employed feature in the discussion section, and disclaim was more frequent than proclaiming. It is pertinent to investigate the evaluative stance and voice in medical RAs since these important aspects of writing were not investigated by the researcher. Shen and Tao (2021), investigated the distribution of stance markers in medical RAs and newspaper opinion columns, employing Hyland (2005) stance interpersonal model of metadiscourse which is comprised of four elements: boosters, hedges, attitude markers, and self-mentions. The results showed that stance markers occurred more frequently in newspaper opinion columns than in the medical RA. The findings indicate that topic similarity across the RAs seems to play an important role in shaping the use of stance, as evident in the similarities of the most frequent stance markers in the two genres. The researchers, however, did not explore the use of voice. Moreover, as data was drawn from RAs focusing on one topic, COVID-19, it is hard to draw pedagogical implications that can be adopted by novice writers. Similarly, McGrath and Kuteeva (2012) and Poole *et al.* (2019) employed Hyland (2005) framework in their analysis of stance and engagement markers in, respectively, pure mathematics and biochemical RAs. The findings in the two studies revealed a consistent decrease in the use of epistemic stance markers indicating doubt and uncertainty. Whereas the former study showed higher than expected reader references and shared knowledge, the latter one revealed a clear increase in boosters marking higher levels of confidence and certainty in the specialized scientific medical RAs, reflecting the fact that truth is absolute in scientific fields.

In the field of linguistics, Hood (2004) drew on the Appraisal model to explore the construction of an evaluative stance in the introductions of English as a Second Language (ESL) undergraduate students' dissertations and RAs published by professional writers of English in social sciences (language and communication). The results revealed that all the texts were heteroglossia to some extent, as the writers encourage readers to align or dis-align by degree through the use of projection and modality to expand voices in the text. Hood (2004), interprets the Engagement system within Appraisal theory as a network of options for +/- Alignment by degree. This elaborate study provides a rich theoretical implication for the Appraisal model as well as pedagogical ones for English for Academic Purposes (EAP) instructors of academic writing in English that will assist them in introducing effective evaluative strategies to their students.

Along similar lines, Alramadan (2020), Xiaoyu (2017), and Cheng and Unsworth (2016) employed the Appraisal model to investigate stance in, respectively, the introduction, the introduction and conclusion, and discussion sections of applied linguistics RAs. Alramadan (2020), employed the Appraisal model in her investigation of authorial stance in the introduction section of applied linguistics RAs in three sets of data: English as a Foreign Language (EFL) students, Arabic texts by professional writers, and texts by professional native speakers of English. Alramadan investigated if interpersonal aspects of academic discourse varied cross-culturally and if the rhetorical strategies employed in the writer's native language transfer to second language writing discourse. Her

findings indicated that culture played an important role in the argumentative discourse across the data. Also, it was found that the texts produced by professional native speakers of English appeared to be more objective and highly heteroglossia. Xiaoyu (2017), also employed the Appraisal theory to analyse the introduction and conclusion sections in 30 applied linguistics' RAs by writers from China and Britain. The findings of the study showed that both British and Chinese writers argued for their propositions while maintaining their positive relationships with their readers; however, in contrasting ways. The Chinese authors added multiple references, and unquestioned claims, and reinforced their explicit attitudes as a means of arguing their positions and this was in line with the findings of other studies (e.g. Hood (2004); Hyland and Milton (1997)). On the other hand, the British writers argued their positions by evaluating entities and others explicitly but they also use more Entertain and evoked Graduation. Cheng and Unsworth (2016) explored 21 discussion sections in applied linguistics RAs and found that proposed claims are enacted primarily through the contractive engagement strategy of 'endorse' by which writers construe strong solidarity with readers and represent current views as shared with the research community.

Furthermore, Loi et al. (2016) explored the evaluative stance in the conclusion section of two sets of psychology RAs. The first was the internationally published RAs in English, while the second set was the locally published RAs in Malay. The findings indicated that evaluative stance and interpersonal meaning varied across the two sets of RAs. The RAs written in English were more reader-friendly than the Malay ones due to the writers' act of contracting dialogic space and an unbalanced deployment of assertion and mitigating strategies.

Zhang and Cheung (2018), studied how published research writers deployed graduation and attitude in the literature review of RAs in the fields of Computer Networks and Communication and Second Language Writing. The findings indicated that the writers preferred to express their attitudes through appreciation rather than effect and judgment. The RAs showed more force than focus resources. The study also showed a significant difference in the use of affect and judgement resources across the two sets of RAs.

To sum up, different fields of knowledge were explored, such as linguistics (Alramadan, 2020; Cheng and Unsworth, 2016; Hood, 2004; Xiaoyu, 2017), psychology (Loi et al., 2016), technology (Zhang and Cheung, 2018), biochemical research (Poole et al., 2019), and medicine (Fryer, 2013; Swayer and Eesa, 2019). However, based on the literature review, there is not, to the researchers' knowledge any study that has employed the Appraisal framework to explore evaluative stance and voice in medical research texts published by professional writers in reputable journals.

Next, the background and justification for the choice of the framework employed in the present study are presented.

3. Analytic Framework

Martin and White (2005) Appraisal framework has been very influential in the study of knowledge construction over the past 20 years. It is probably the most complete one for examining stance and authorial voice. Martin and White (2005), noted that the framework of Appraisal theory is concerned with how writers take a stance and express their subjective presence in their texts. It is also concerned with how writers position their audience, and how they voice their criticisms, opinions, views, approvals, and disapprovals. The Appraisal theory does not only reveal the writer's values and attitudes but also highlights the relations of rapport and authority between the writers and readers. In Martin and White (2005) account of Appraisal, they focus on meanings at the level of discourse semantics that provides writers and speakers with the means to be critical, value, reject, accept, and challenge others' positions. As a result of what Appraisal theory offers, researchers can legitimately reach elaborate conclusions about how writers construct their authorial voice and take a stance in their writing. Consequently, Appraisal theory within SFL was selected as the framework for the current study since it reflects the social context and synthesises the various types of stances in academic writing (Akinci, 2016; Aull, 2019; Cominos, 2011; Crosthwaite et al., 2017; Don, 2016; Flowerdew and Li, 2007; Geng, 2015; Hood, 2004; Mora, 2017; Myskow, 2018; Read and Carroll, 2012; Xiaoyu, 2017).

SFL is considered a theory of language and at the same time an important framework for analysis. It was developed by Michael Halliday in 1978. Knowledge or meaning is approached in SFL from a social semiotic perspective. SFL explores and explains how meaning is made and developed not only in verbal language but in several modes of semiosis, such as images, tables, and graphs. A basic assumption in SFL is that language serves three functions: experiential, interpersonal, and textual. Ideational meaning refers to what texts are about, interpersonal meaning is how relationships are made through language, and textual meaning refers to how information is organized into coherent texts. Halliday (2014), defines three register elements that are key to shaping the forms of language. The first is 'field' which is the topic or activity taking place; the second is 'tenor' which is the types of relationships between the participants, and the third is 'mode' which is the medium of communication, such as written or spoken. The three elements of field, tenor, and mode determine the 'register' of language.

Because of the current study's focus on interpersonal meaning, the tenor is the registered variable of concern. Tenor refers to the role of the participants involved in a communicative event (i.e. writer/reader and speaker/listener). Martin and White (2005), described the interpersonal in language as being concerned with the subjective manifestations of writers in texts realised in the ways they present their stance towards the material and readers they communicate with. Based on that, the researchers extended and developed the SFL interpretation of interpersonal meaning to develop the Appraisal theory. The Appraisal system takes into consideration many kinds of author voices and various types of stances. It considers the wide array of resources used by both writers and speakers when evaluating phenomena, interacting with their readers and listeners, and describing the position and point of

view of their audience. Martin and White (2005), noted that the Appraisal theory includes three subsystems Figure 1 (1) attitude, (2) graduation, and (3) engagement.
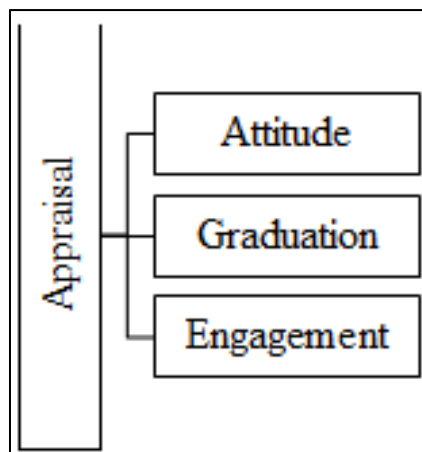

Figure-1. Appraisal subsystems

The first subsystem is 'attitude' which is concerned with the writer's feelings, evaluation of things, and judgement of behaviour. Second, graduation deals with the values by which writers decrease or increase the interpersonal impact of their propositions. Third, engagement attends to the various voices and opinions in discourse and how the author's voice is positioned with the propositions conveyed by the text. Attitude attends to the resources used by writers/speakers to negatively or positively evaluate phenomena. It is further divided into three categories; affect, judgement and appreciation. The effect is concerned with expressing one's feelings, judgment deals with moral judgments of human behaviour and appreciation attend to the assessment of objects and states of affairs rather than people's behaviours (Martin and White, 2005) as indicated in Figure 2.
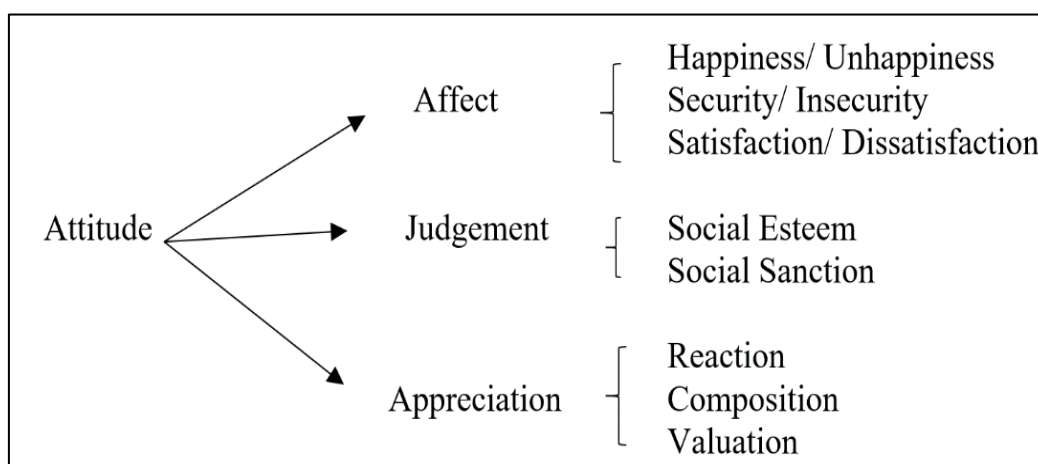

Figure-2. The framework for Attitude

Graduation is the second subsystem of Appraisal that is concerned with grading feelings, judgements, and assessments (Figure 3). In other words, it is the toning-down or toning-up of meanings. Martin and White (2005) argued that attitude and engagement can be both down-scaled or up-scaled depending on the resources of graduation. These resources can be described in terms of force and focus. Martin and White (2005), identified force as meanings being graded from low to high intensity. Force can be explicitly realised through adverbials, adjectives, measures of amount, time and distance, repetition, expletives, and swearing, such as slightly, total, much, bloody, and so on. Force can also be realised implicitly, such as using metaphors and lexical items with graded meaning, such as "dislike," "hate," and "despise." Focus can raise or lower intensity by either sharpening (e.g., "the movie was really scary"*)* or blurring meanings (e.g., "the movie was sort of scary").
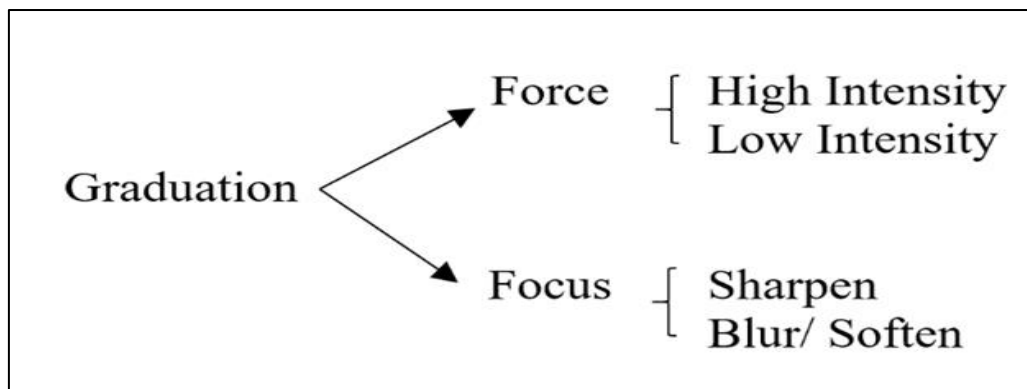
Figure-3. The subsystems of Graduation

Engagement refers to the linguistics resources available by the language that writers use to take a stance towards the positions and values in the text and with consideration of their readers. Martin and White (2005), noted that all verbal communication is considered 'dialogic' because writers encode their point of view and voice their values towards what they write and whenever they write. Their approach toward engagement is informed by Bakhtin (2010) concept of heteroglossia, meaning that all communication whether written or spoken has a dialogic nature. Martin and White add the notion of monoglossia, which means that there are no dialogistic alternatives. They also add the notions of expansion and contraction to engagement. If there are instances of dialogic exchange, then we have an expansion, but if the interchange of other propositions is shut down, we have a contraction and each notion has its identifying categories (Figure 4).
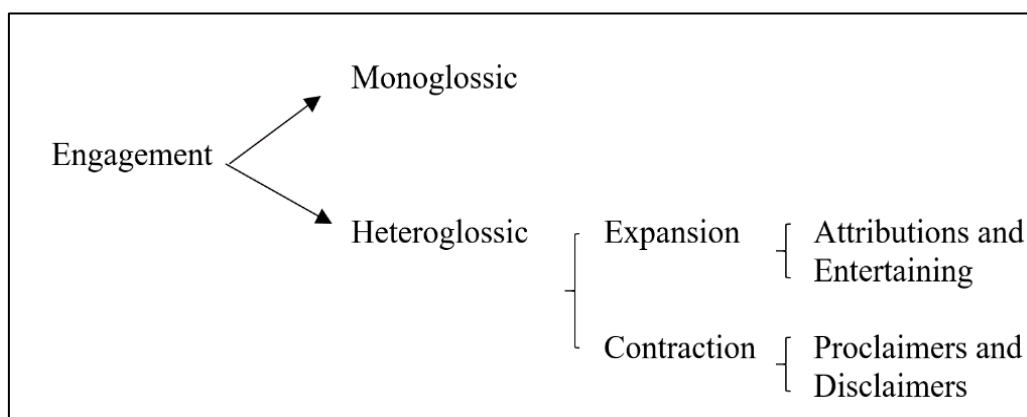

Figure-4. Engagement framework

Under the notion of expansion, Martin and White differentiate between attribution and entertainment by arguing that the latter is the internal voice in a certain context while the attribute is the external voice.

The three subsystems of the Appraisal model enable researchers to reach elaborate conclusions about how writers are influenced by culture. The Appraisal model allows researchers to touch on the various voice strategies and the holistic stance of writers, while Hyland and Tse (2004) model and Hyland (2005) model only considered two kinds of voice and stance structures (Hood, 2004; Xiaoyu, 2017; Xu and Nesi, 2019). Therefore, it only seems appropriate to identify the features of voice and stance in the current study through the Appraisal model.

4. Methodology
4.1. Research Design
According to Guba (1990), the constructivist/ interpretive paradigm assumes that knowledge is socially constructed. Therefore, for the present study, a constructivist/ interpretive paradigm was chosen. The study involves a detailed qualitative analysis of medical research texts to provide insights into their evaluative nature. A qualitative study was chosen over a quantitative one due to the researcher's interest in providing a detailed study of individual texts to provide insights into how language evolves across texts. However, quantitative analysis was used to quantify the writers' preferences for the various types of evaluation aspects such as attitude, values, and so on.

4.2. Data
Data comprised 27 discussion sections (55,559 words) extracted from medical RAs published in reputable ISI journals (Journal of the Saudi Heart Association, The Saudi Medical Journal, and the journal of PLOS Medicine). The current research design focuses on the discussion section of published RAs since language forms are means of expressing knowledge that reflect and at the same time are shaped by the values and practices of that specific discipline. The discussion section was selected for the linguistic analysis because it is the section of the RAs where the writers present their propositions and at the same time project claims from the literature (Bitchener and Basturkmen, 2006). Geng (2015), noted that for writers to fulfil the task of writing the discussion section they need to use a range of interpersonal resources. This section is selected since it is considered a rich site that foregrounds

critical judgement, and evaluative language and provides a context for arguing and justifying one's research. The implication of the present study is to provide findings on how interpersonal meaning is deployed in the discussion section of the research text when writers are citing previous literature and articulating their claims.

4.3. Analytical Procedures

The focus of this investigation was on evaluative language and Appraisal features in one section of the research discourse, that is the discussion. The academic texts were first converted from PDF to text format. Second, information like titles, authors, institutes and abstracts, figures, tables, captions, footnotes, acknowledgements, notes, references, and appendices were removed. Then, the resulting data were imported into the UAM Corpus Tool (O'Donnell, 2011). The UAM Corpus Tool is a free open-source downloadable program for annotating each text in a corpus at multiple levels. The UAM Corpus Tool has several functions that facilitate automatic and manual annotation. It also provides descriptive and contrastive statistics of the data. As the evaluative concepts of stance and voice cannot be identified by any current software, they were annotated manually, and then reviewed and cross-checked to ensure the accuracy of the analyses. To minimize subjective analyses that might obstruct the reliability of the present study, intercoder reliability methods were employed (Mackey and Gass, 2005). First, the data were annotated in January 2020 and then after two months, the data was annotated again to ensure that the coding was consistent. Validity was achieved by calculating the percentage of the frequencies of the occurrences of each item of the Appraisal features in the analysis via SPSS version 24. Quantitative data was used to validate statements such as most frequent, least frequent, most, and more.

5. Results

The Appraisal model considers various resources used by writers when evaluating phenomena, interacting with their readers, and describing the position and point of view of their audience. Martin and White (2005), noted that the Appraisal theory includes three subsystems: (1) attitude, (2) graduation, and (3) engagement. The three subsystems of Appraisal provide the writer with a network of meaning choices that they can select from. In the current study, there were 4983 instances of Appraisal across the discussion section of medical RAs (Figure 5).
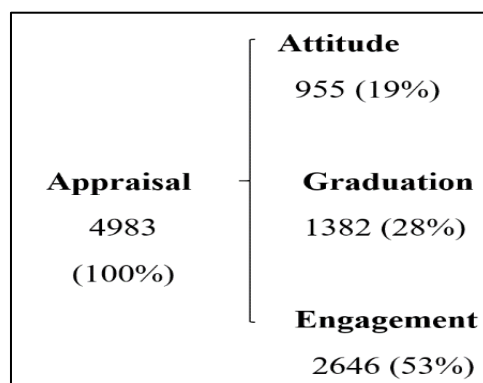
Figure-5. Number and percentage of Appraisal in the data

As illustrated above, instances of engagement systems were the most frequent in the data with a frequency of 53%. The subsystem of graduation had a frequency of 28%, while attitude instances were the least frequent at a frequency of 19%. Martin and White (2005), noted that attitude includes three subsystems as indicated in Table 1. Appreciation was the most dominant attitudinal type in professional writers' texts.

Table-1. Attitude instances in the discussion section of medical RAs

Attitude subsystem	Affect	Judgement	Appreciation
Professional writer texts	31 (3.2%)	79 (8.3%)	845 (88.5%)
Total	955		

First, affect accounted for only 31 instances in the professional writer data mostly as security. A further finding in the data is that instances of affect reflected emotional responses that were either authorial or non-authorial. Authorial and non-authorial affect evaluations are illustrated in Table 2.

Table-2. Affect resources in the discussion section of medical RAs

Data	Happiness		Security		Satisfaction		Total
	No.	%	No.	%	No.	%	
Professional Writer Texts	8	25.8	20	64.6	3	9.6	31
Authorial Affect			Non-Authorial Affect				Total
11 (35.5%)			20 (64.5%)				31

In the professional writer texts, 11 instances were classified as authorial and 20 were non-authorial (Table 2). Of the 11 authorial affect resources, 10 were connected to negative feelings such as having concerns about the findings or the results of the study.

Second, another attitudinal subsystem explored in the current study concerns how writers in both sets of data encoded values of judgement. The analysis revealed a very strong preference for coding judgement as capacity which accounts for 96.2% of the total number of judgement instances, as indicated in Table 3.

Table-3. Judgement resources in the discussion section of medical RAs

Data	Social Esteem						Social Sanction				Total
	Normality		Capacity		Tenacity		Veracity		Propriety		
	No	%	No	%	No	%	No	%	No.	%	
Professional writer texts	1	1.3	76	96.2	0	0	0	0	2	2.5	**79**

Third, the dominance of appreciation in the data and the distribution of the categories of appreciation are illustrated in Table 4.

Table-4. Appreciation resources in the discussion section of medical RAs

Data	Reaction				Composition				Valuation	
	Impact		Quality		Balance		Complexity			
	No	%	No	%	No.	%	No.	%	No.	%
Professional writer texts	14	1.7	2	0.2	114	12.6	72	8	643	76
Total	**16 (2%)**				**186 (22%)**				**643 (76%)**	

Table 4 shows that professional writers frequently employed values of valuation in their texts which accounted for 76% instances of appreciation. Also, the texts had the category of reaction as the least frequently used value of appreciation. The high instances of valuation and low instances of reaction in the data revealed that writers preferred to evaluate the significance and value of phenomena rather than expressing their emotional reactions to them.

Next, graduation is the second subsystem of Appraisal and it is concerned with grading feelings, judgements and assessments. In the texts, there were 28% instances of graduation. The professional writers employed more force than focus with a frequency of 94%. Focus accounted for only 6% of the medical texts. In terms of up-scaling and down-scaling, the professional writers tended to up-scale force more than down-scale it. However, in terms of focus, the writers softened the focus of meanings more than they sharpened it. Instances of graduation in the discussion section of medical RAs are provided in Table 5.

Table-5. Graduation in the discussion section of medical RAs

Professional Writer Texts				Up-scale	Down-scale	Total	
Force 94%	Quantification (amount)	Number		164	19	183	13%
		Mass		119	118	237	17%
		Extent	Prox	2	41	43	3%
			Dis	59	19	78	6%
	Intensification (degree of intensity)	Quality (degree)		652	96	748	54%
		Process (vigour)		17	2	19	1.5%
Focus 6%	Sharpen (up-scale)					25	2%
	Soften (down-scale)					49	3.5%
Graduation Total				**1382 (28%)**			

Furthermore, the framework of engagement provides a systematic account of how writers linguistically voice their values and how they position their readers and the backdrop of other voices and points of view. The frequency of monoglossic and heteroglossia propositions in the present study's data is illustrated in Table 6.

Table-6. Frequency of Monoglossic vs. Heteroglossic propositions

Data	Monoglossic		Heteroglossic	
	No.	%	No.	%
Professional writer texts	87	3	2559	97

As presented in Table 6, the professional writers preferred heteroglossia propositions more than monoglossic ones. They had more heteroglossic propositions (97%) than monoglossic (3%). Heteroglossic propositions, in contrast to monoglossic ones, recognized positions that can be different from the writer's own. In addition, the professional published writers were more contractive (65%) than expansive (35%). This indicates that the writers preferred to restrict the scope of alternative positions and contract the dialogical space in their medical academic texts rather than open it up, as presented in Table 7.

Table-7. Frequency of Contractive vs. Expansive resources in the discussion section of medical RAs

Data	Contractive		Expansive	
	No.	%	No.	%
Professionally published writer texts	1661	65	898	35

The frequency of resources of dialogic contraction employed by professional published writers is illustrated in Table 8, indicating that the professional published writers employed more resources of proclaiming than disclaim. This means that the writers preferred to show authorial interventions to limit the scope of alternative propositions rather than to directly reject or replace or overrule certain alternative positions.

Table-8. Frequency of the resources of Dialogic Contraction

Data	Contract									
	Disclaim				Proclaim					
	Deny		Counter		Concur		Pronounce		Endorse	
	No.	%	No.	%	No.	%	No.	%	No.	%
Professionally published writer texts	353	14	454	17.7	11	.4	232	9	611	24
Total	807 (32%)				854 (33%)					

Within the disclaim category there are two sub-types: deny (negating a proposition) and counter (countering a proposition). In the data of the current study, the professional published writers employed more resources of a counter which accounted for 17.7%. As presented in Table 8, proclaim accounted for 33% of the professionally published writer texts. Proclaim is divided into three categories concur, pronounce and endorse. First, concur involves formulations that align the writer with the text's putative reader. In the current data, only 0.4% accounted for the occurrences of concurring formulations in the professionally published writer texts. Second, pronounce is a subtype of proclaiming that involves overt interpolations and interventions by the authorial self. In the data, there were only 9% instances of pronouncement formulations. Third, an endorsement is a final subtype of proclaiming which refers to those formulations where a proposition is sourced by the authorial voice to an external voice that is considered valid and undeniable accounting for 24%. The professional published writers overwhelmingly showed a listing tendency of previous literature in the non-integral citation format. Such formulations construed a rhetorical move that makes the authors' argument strongly accepted, valid, and highly warrantable. Additionally, this use of non-integral citations had the effect of construing the writers as completely aligned with the literature (Hyland and Tse, 2004).

Moreover, in terms of expansive formulations, there were two types entertain and attribute, as indicated in Table 9.

Table-9. Frequency of the resources of Dialogic Expansion

Data	Expand					
	Entertain		Attribute			
			Acknowledge		Distance	
	No.	%	No.	%	No.	%
Professionally published writer texts	733	28	163	6.4	2	.5
Total	733 (28%)		165 (7%)			

Formulations of entertainment were the most common types of dialogistic expansion in the data accounting for 28%. The second major type of dialogistic expansion is attribution and it falls into two subtypes acknowledge and distance. Formulations of acknowledge accounted for 6.4% of the data and distance accounted for only 0.5%.

In addition, the engagement co-articulation patterns that occurred most frequently in the discussion section of medical RAs were also examined. In the current data, the qualitative analyses found six frequent patterns of engagement co-articulations as presented in Table 10.

Table-10. Co-articulation patterns of Engagement in the data

Data	Co-articulation Patterns of Engagement					
	Deny+	Acknowledge+	Pronounce+	Counter+	Entertain+	Endorse
Professional writers	26	20	49	67	45	13

As indicated in Table 10, the most frequent combinations in the professional published writer data included counter (67 co-occurrences) and pronounce (49 co-occurrences). The least frequent co-articulation patterns included endorse and acknowledge which accounted for 13 and 20 instances, respectively. The most frequent engagement pattern in the professionally published texts was counter + deny. In terms of contraction and expansion preferences, the professional published writers preferred to expand and then contract as an engagement pattern.

According to the dialogic perspective of Appraisal, writers do not only announce and express their attitudes and positions but also use signals that indicate how the authorial voice aligns or misaligns the addressee or putative reader. Therefore, engagement formulations are used to signal both the position of the authorial voice towards the propositions being discussed in the colloquy and at the same time, how the putative reader is positioned in the text. In the current study, the relations of alignment, misalignment, and solidarity between the writer and the putative reader in the medical academic texts were explored and the findings are presented in Table 11.

Table-11. The Authorial voice – Putative reader relationship in the discussion section of medical RAs

Data	Heteroglossic								Monoglossic
	Aligned			Misaligned			Divided	Neutral	
	Concur	Endorse	Counter	Deny	Pronounce	Distance	Entertain	Acknowledge	
Professional writers	11	611	454	353	232	2	733	163	87
	1076 (42%)			587 (23%)			733 (28%)	163 (7%)	

As demonstrated in Table 11, the professional published writers positioned 42% of their readers as being aligned with their propositions through formulations of endorse, counter, and concur.

6. Discussion

The first research objective was to explore what features of attitude (affect, judgment, and appreciation) were disseminated across the discussion sections of medical RAs produced by professional published writers. In the data, the most dominant attitudinal type was appreciation which accounted for 88.5%. The writers preferred appreciation as an attitudinal category to judgement and affect. This dominance of appreciation resources in the texts established a sense of objectivity and eliminated subjective involvement by the writer. Liu (2013) noted that this pattern of appreciation dominance is a feature of argumentative texts. This tendency was also reported in previous research in the literature (Alramadan, 2020; Hood, 2004; Liu, 2013; Xiaoyu, 2017; Zhang and Cheung, 2018). The writers also showed a tendency to express appreciation as valuation (76%). They preferred to value phenomena rather than show their emotional reactions. This finding parallels (Alramadan, 2020; Hood, 2004; Xiaoyu, 2017; Zhang and Cheung, 2018) who reported that professional published writers strongly employed appreciation as value of valuation. Another interesting finding, also found in Alramadan (2020), was the presence of appreciation as composition (22%) in the professionally published texts. Both appreciations as valuation and composition contributed to the texts' objectivity. However, in Xiaoyu (2017), the professional published writers did not tend to express appreciation for composition.

The second subsystem of attitude affects and accounted for only 31 instances (3.2%) in the data. This finding is in line with the findings documented in Xiaoyu (2017) who reported that the effect in the professional writers' texts only accounted for 7%. Additionally, the findings related to authorial and non-authorial effects indicated that 11 instances were classified as authorial and 20 as non-authorial. Of the 11 authorial affect resources, 10 were connected to expressing negative feelings such as having concern about the findings or the results of the study. In this view, authorial affect refers to the emotional reactions of the authors while non-authorial affect refers to the emotional reactions of others such as the participants, the patients, or the interviewees. Professional writers tended to encode their emotional responses to show their hopes and concerns about research outcomes, and to justify their motivation to carry out their study. This finding is consistent with Alramadan (2020) who reported that professional writers preferred to encode non-authorial rather than authorial effects in their texts.

The third subsystem of attitude that was investigated in the present study was judgement and it accounted for (8.3%). The professional published writers preferred to encode judgement as capacity which accounted for 96.2% of the total judgement instances and there were no instances of tenacity and veracity in their texts. This is in line with Alramadan (2020) and Liu (2013) findings. This indicates that professional writers are not concerned with truthfulness or morals, but with intellectual capacities. Another observation in terms of grading expressions of attitude revealed that the professional published writers employed more force (94%) than focus (6%) in their texts. They also softened (4%) the focus of attitudinal meanings more than they sharpened it (2%). In this context, the writers amplified meanings for a more compelling proposition and at the same time softened the focus to allow for negotiation. Such findings are consistent with studies by Alramadan (2020), Hood (2004), Swayer and Eesa (2019), and Zhang and Cheung (2018).

The second research objective in the present study was to explore the construction of authorial voices through the use of evaluative language by professional published writers in the discussions of medical RAs. The most occurring system was engagement (53%), followed by graduation (28%), and then attitude (19%). These findings indicated that interpersonal language in the discussions of medical RAs was highly achieved through engagement. This tendency of achieving interpersonal meaning through engagement is in line with Geng (2015) who indicated that engagement accounted for 75% of the Appraisal instances in the data. However, in Alramadan (2020) and Swayer and Eesa (2019), the most frequently employed formulations belonged to the system of attitude.

Professional writers also showed a preference for heteroglossic propositions (97%). The infrequent presence of monoglossic propositions in the texts (3%), indicated that they preferred to be more dialogic rather than characterising the propositions as factual and with no alternative positions, hence closing up the dialogic space. The fact that the professional published writers' voice was overwhelmingly heteroglossic indicated that they construed themselves as in negotiation with their audience readers who hold a different position. This finding parallels Alramadan (2020), Fryer (2013), and Xiaoyu (2017) who found the professional academic texts to be more heteroglossic.

Another distinction Martin and White (2005) made was between heteroglossic contractive propositions and heteroglossic expansive ones. The writers employed more contractive engagement resources (65%) than expansive

ones (35%). This indicated that the professional published writers preferred to restrict the scope of alternative positions and contract the dialogical space in their medical RAs rather than open it up. This contrasts with the findings reported by Fryer (2013) and Swayer and Eesa (2019) findings which indicated that professional writers employed more expansive resources in the medical RAs. The writers in the current data might be attempting to elicit reader confidence in the scientific knowledge they are discussing and, hence, are more contractive than expansive. Similarly, Alramadan (2020) and Xiaoyu (2017) also reported that professional writers in their studies preferred expansive resources over contractive ones in their academic texts. However, the findings are in line with Loi *et al.* (2016) who noted that the professional writers in their data employed more contractive resources than expansive ones.

Within the subcategory of dialogic contraction, the writers employed slightly more resources for proclaiming (33%) than disclaiming (32%). This finding is parallel to Loi *et al.* (2016) who reported that in their study, professional writers employed more proclaim resources than disclaim. However, Alramadan (2020) found opposing results to the findings of the present study. She reported that disclaim was preferred to proclaim in the professional writer data. In the professionally published texts, proclaim was expressed through resources of concur (0.4%), pronounce (9%), and endorse (24%). This finding is in line with Alramadan (2020) study which reported that endorse was the most frequent proclaim resource and concur was the least frequent in her professional writer data. By contrast, Xiaoyu (2017) reported that pronunciation was the most frequent proclaim subtype in their professional writer academic texts. Additionally, concur was the least frequent proclaim resource used by professional writers in the current study. Possibly, professional published writers did not employ resources of concurring due to their unawareness of its existence as means of constructing an evaluative stance. The professional writers preferred to refer to the literature by employing endorsed resources. This might indicate that professional published writers in the medical field find it important to provide evidence from the literature to support the propositions they make. A noteworthy observation was that most of the endorsed instances were in the non-integral citation format.

In the professionally published texts, disclaim was expressed through the resources of denying (negating a proposition) and counter (countering a proposition) which accounted for 14% and 17.7%, respectively. The professional published writers employed more counter than deny in the discussion sections of research texts. The current findings are similar to Alramadan (2020) study which revealed that professional writers employ more counter resources than deny in their academic texts. In another study conducted by Fryer (2013), the professional writers used the resources of denying and countering equally. However, Xiaoyu (2017) reported that in his study, professional writers employed more resources of denying than a counter.

Moreover, formulations of entertainment were the most common types of dialogistic expansion accounting for 28%. The second major type of dialogistic expansion is attribution and it falls into two subtypes acknowledge and distance. Formulations of acknowledge accounted for 6.4% of the texts. However, the second subtype of attribution known as distance only accounted for less than 1% of the data. These findings are parallel to Xiaoyu (2017) findings which indicated that professional writers employed more entertaining formulations in their academic texts. However, Alramadan (2020) and Loi *et al.* (2016) reported that instances of acknowledgement were more than entertaining in their data. Interestingly, the distance was in Alramadan (2020) and Xiaoyu (2017) studies the least frequent expansion type used by professional writers.

Another area explored was the patterns of engagement and their most frequent co-articulations in the texts. The analysis revealed that the most frequent patterns were counter + deny, pronounce + entertain, and entertain + endorse. In the professionally published texts, the most frequent pattern was counter + deny. This pattern allowed the textual voice to invoke a contrary position and then replace it by employing two formulations of disclaim. Resources of counter and deny both contracts the dialogic space and limit its scope. Second, the pattern of pronouncing + entertain was also frequent in professional writer texts. The authorial voice first contracts the dialogic space and limits the scope of any further alternatives in the discussion. Then, the authorial voice expands the dialogic space by offering its proposition as one of a range of various positions. Third, the pattern entertain + endorse was also frequent in the professional writer data. The textual voice employed the resources of entertainment to present a proposition as a possibility, but then, contracted the dialogic space and aligned it with an external voice. In this pattern, the proposition was first considered as just a possible position among a range of other possibilities, then, it was considered as more than a possible one to be true, valid, and extremely warrantable. Xiaoyu (2017) also explored engagement co-articulations in professional writer academic texts and reported different findings. In his texts, professional writers showed a preference for the following co-articulation patterns: entertain + entertain, counter + entertain, and the most frequent pattern was entertain + deny. He noted that the majority of the patterns found in his data allowed the authorial voice to expand and then contract. So the dialogue unfolded from expansion to contract and hence, the communicative space was opened up and then closed down.

The third research objective was to explore the assumptions that the professional published writers made about their putative readers in the medical RAs. In the texts, monoglossia accounted for only 3% while heteroglossia accounted for 97% of engagement resources. As a result, the putative reader was perceived as an objective and active participant in the discourse. The professional published writers assumed that 42% of their readers are aligned while 23% are misaligned. The authorial voice employed resources of endorse, counter, and concur to maintain solidarity with the reader who is assumed to be on par with the textual voice's views. In addition, formulations of pronounce, deny, and distance was employed in the medical RAs to indicate the writer's position to a reader who is challenging and questioning. The authorial voice viewed 28% of its readers as being in agreement or disagreement and potentially having alternative positions. As such, the textual voice validates the putative reader's alternative views, hence maintaining writer-reader solidarity. The writers employed formulations of entertainment to construe a heteroglossic backdrop for the ongoing discussion assuming that the putative readers may be divided over the matter

under discussion. The professional published writers viewed 7% of their readers as neither aligned nor misaligned and remained aloof from any expectations of solidarity with their putative readers. This was accomplished through formulations of acknowledgement that allowed the reader to enter into the dialogue with no specific relationship with the putative reader. Therefore, the putative reader is naturalized and construed as posing specific views or opinions. The authorial voice in the data construed the putative reader as being an equally active participant who might have alternative positions. Thus, the writers of the discussion section of medical RAs maintained a relationship of solidarity with the reader and showed high tolerance for alternative positions.

7. Conclusion

The present study was informed by Halliday (1978) SFL approach to language which contributes to our understanding of how interpersonal meanings are constructed in discourse. It employed the Appraisal framework developed and extended by Martin and White (2005). First, the analysis of attitudinal evaluation in the discussion section of medical RAs indicated that professional published writers had high instances of Appraisal in the discussion section of the medical RAs. This means that language played an important role in the data and was used rhetorically to achieve argumentative goals. In terms of dissemination of attitudinal features in the data, few differences were found. The professional published writers chose to encode attitude as appreciation. This indicates that professional writers avoid personalized expressions of emotion and subjective judgements of behaviour. They instead preferred to evaluate the significance and importance of phenomena.

Next, the second research objective was to explore the construction of authorial voices through the use of evaluative language by professional published writers in the discussions of medical RAs. The qualitative analysis of engagement indicated that interpersonal language was highly achieved through the resources of engagement. Formulations of engagement accounted for 53% of the professionally published writer texts. In addition, the writers preferred heteroglossic propositions more than monoglossic ones. The writers had more heteroglossic propositions (97%) than monoglossic ones (3%). The indication was that the professional published writers preferred to be more dialogic and construed themselves as in negotiation with their audience readers who hold a different position. Also, the results showed that the professional published writers were more dialogically contractive than dialogically expansive. This shows that the writers preferred to restrict the scope of alternative positions and contract the dialogical space in the discussion section of their medical RAs rather than open it up. Moreover, the findings showed that the writers employed more resources for proclaiming than disclaiming. Thus, they preferred to show authorial interventions to limit the scope of alternative propositions rather than to directly reject or replace or overrule certain alternative positions.

Third, the final research objective was to explore the assumptions that professional published writers made about their putative readers of the discussion section in medical RAs. The findings were that the authorial voice construed the putative reader as being an equally active participant who might have alternative positions. Thus, the writers maintained a relationship of solidarity with the reader and showed high tolerance for alternative positions. In addition, the professional published writers viewed the majority of their putative readers (42%) as in complete alignment. They expected their audience to share the same values and beliefs and agree with their propositions and not reject or resist them. Furthermore, the professional published writers validated the putative reader's alternative views. In sum, the authorial voice maintains solidarity with all types of readers, ones holding similar positions and ones holding alternative propositions.

The study may have pedagogical implications for EAP instructors of academic writing in English that will assist them in introducing effective evaluative strategies to their novice academic writers. It may also offer new directions in the development of literacy in the genre of academic research writing.

Future research can focus on interviewing and surveying the authors to gain insight into why they preferred or avoided certain rhetorical strategies. In addition, future studies can investigate cross-cultural appraisal use in the academic medical texts of undergraduate students from different contexts such as undergraduate native speakers of English. Further research can also investigate the use of Appraisal and its rhetorical strategies in other sections of medical RAs, such as abstracts, introduction, review of literature, and conclusion.

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