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METADISCOURSE IN ACADEMIC GENRES: AN INTERDISCIPLINARY STUDY OF RESEARCH ARTICLES IN SUDAN

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ABSTRACT: *Metadiscourse is a ubiquitous aspect of all academic discourse in its attempt to align with readers, and, hence, this study purports to investigate cross-disciplinary variations in its deployment in 60 research articles produced locally by Sudanese academicians in six domain s. Utilizing Hyland's (2005) typology, the corpora were compared in terms of patterns of metadiscourse and how these strands represent the Weltanschauung of particular discourse communities. Findings indicate that the corpus is characterized by a relative oblivion to the interpretive needs of readers. On the other hand, the dichotomy between interpretive discursive and natural incremental fields was borne out by the statistics. This is manifest in the preponderance of overall features in the former, together with their proclivity to draw on more interpersonal elements to establish rapport. The study has also uncovered marked deviations in the ratios of hedging, boosters and attitude markers in Chemistry and Civil Engineering compared to studies of sociology of knowledge. Yet, subtle, but significant, distinctions in the linguistic embodiment of these categories were found to set these disciplines apart from Economy and Applied Linguistics. Finally, the epistemologically contingent nature of Medicine and the empirical tendencies within Geography were positively correlated with their metadiscourse figures. The implications for teaching academic discourse are also explored.*

KEYWORDS: Metadiscourse, Textual, Interpersonal, Discipline, Research Articles

INTRODUCTION

Academic discourse is conventionally regarded as an impersonal, objective and detached mode of communication, as it is grounded in the tenets of the impeccable reliability and universality of natural laws. This positivistic paradigm is rooted in the ontological doctrine that truth and reality are free and independent of the viewer and observer and could be measured empirically through rigorous and rational investigation and analysis (Popper, 2008). This *discourse of Truth* (Lemke, 1995: 178) envisages the researcher as a mere ghost, masquerading behind the facts, expressing himself succinctly in author-evacuated prose (Weissberg and Buker,1990), and relaying the narrative of Nature (Myers, 1990). By the same token, a reader is expected to elicit information unambiguously, since such discourse is transparent, omitting the need for much elucidation on the part of the writer, with words merely viewed as the lens through which research is seen (Thompson, 2005). These two principles have been questioned,

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and even superseded, in the late 20th century. The social dimension of academic discourse is increasingly acknowledged Writers are now seen as active agents in the construction of knowledge which is by necessity suffused with subjective beliefs and authorial identity (Hyland, 2001: 209). In the same vein, these self - same scholars have to negotiate the status of their claims and project their persona into their work, blending their tentative claims to certainty with more vigorous conclusions and, thus, consolidating their position as expert researchers.

With respect to the dimension of the reader, knowledge is increasingly seen as what is socially ratified (Kuhn, 1970; Bruffee, 1986; Bizzel, 1992; Rorty, 1997) and, hence, the normative power of discourse communities in shaping disciplinary expectations, constitution of the heritage upon the scaffolding of which any novel research should be based and, ultimately, bestowing legitimacy upon the produced claims (Swales, 2004; Howard, 2008, Hyland, 2003). At a more banal level, the researcher is necessarily cognizant of his need of readers, as all scientific theorems are no longer held to be a faithful reflection of truth, but merely one attempt to construe Nature, and can be *falsified* (Popper, ibid) through future experimentation . In fact, there are many plausible interpretations for any set of data, and thus open to contestation and so the writer must resort to persuasive strategies to gain the acceptance of readers. (Hyland, 1998; Giner, 2009). Finally, even original claims have to incorporate interactional elements consistent with the norms of the discourse community and strike a balance between the researcher's voice as an *authority* and his humility as a *servant* of the discipline, to use Hyland's (2001) useful terms and, hence, be regarded as accredited knowledge.

As the social nature of knowledge is embraced, writers such as Williams (1981); Vande Kopple (1985, 2002) and Crismore (1993, 2011) have perceived a duality between a textual level concerned with the propositional content or the subject content of the text, whereas the second level is subsidiary and it encompasses both the presence of the author and the textual cues indicating his awareness of the reader. Variously known as signaling (Myer, 1990); discourse markers (McCarthy, 1990) and metatalk (Schiffrin, 1980), the secondary level is best designated as meta- discourse, a term coined by Harris in 1952 but gained wide currency only in the 1990s in the domain of academic discourse analysis. This study purports to investigate the density of use of metadiscourse in 60 research articles produced by Sudanese academicians in six disciplines.

LITERATURE REVIEW

As pragmatic constructs, metadiscourse features are "crucial rhetorical devices" (Hyland, 1998:5) that allow the writer to acknowledge, accommodate and engage with the reader accordingly to socially sanctioned norms. This underscores the image of the writer as a credible agent, equipped as he is with the stylistic choices congruent with the epistemological conceptions of a discipline, so that he can present his own *voice* in ways consistent with the socio- literate practices. Writers have to take a stance and then

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persuade the reader to accept a position (Hyland, 2002) by evaluating the propositional content in a disciplinary sanctioned manner. This entails anticipating and responding to readers' reactions to the text (Thompson, 2001) and assessing claims against a background of disciplinary knowledge. To sum up, metadiscourse is an integral element of all coherent (academic) discourse, as it is the means by which writers display their consciousness of the writing activity and create rapport and interaction with their readers, striking the appropriate balance between allegiance to the norms of the discourse community and their individual credentials with the ultimate goal of producing successful reader – responsible prose..

A number of taxonomies have been proposed for classification of types of metadiscourse (e.g. Vande Kopple, 1985; Crismore et al, 1993; Mauranen, 1993; Dafouz, 2003; Hyland, 1998, 2005; Tse and Hyland, 2009; Burneikaite, 2008). Invariably, these writers group such pragmatic features under the rubric of *textual* and *interpersonal* metadiscourse, thus adopting Halliday's (1994) tripartite conception of macrofunctions of language, including the ideational function concerned with propositional aspects of the text; the textual function relates the creation and organization of the text in order to be coherent to the addressee and, finally, the interpersonal function comprises role mediation both at the individual level, expressing affective aspects, and at the social level, social interaction between participants in the communicative process. The last two have their counterparts in textual and interpersonal metadiscourse. The former refers to the organization of the text while the latter reflects the writer's stance towards both the contents of the text and the potential reader. Textual metadiscourse includes such elements as conjunctions, text sequencers and topic markers, while citation markers and evaluative and attitudinal language are endorsed under interpersonal metadiscourse typology.

A spate of research has investigated disciplinary variations in employment of metadiscourse in research articles (e.g. Moreno, 1998; Mur Duenas, 2011; Hyland, 1998, 2001, 2008; Crismore and Abdollehzadeh, 2010; Salek, 2014). Such a corpus perspective also informs metadiscoursal analyses of Ph. D .theses (e.g. Hyland, 2004; Lee and Casal, 2014; Roberts and Cimasko, 2008; Li and Wharton, 2013'). Both strands of research have linked employment of metadiscoursal features to such factors as generic conventions, contrastive rhetorical styles and individual idiosyncratic preferences. However, the bulk of that research has detailed the way in which difference of discipline affects the density and types of such aspects as hedging, evidentials and self-mention, for instance.

Anchoring this survey within the Sudanese context, of the ten metadiscoursal aspects, only cohesion has been tapped to any length and merely from a descriptive point of view in student' expository essays by Gaibir (1995); Mohammed (1999); Abdallah (2000) and, from a contrastive rhetoric perspective, by Arabi (2011). Yet, to the best of the researcher's knowledge, no study has tackled the issue of cohesion in academic writing produced in Sudan. Indeed, analysis of academic discourse is an uncharted territory in applied linguistics research by Sudanese scholars. However, a dual urgency for such investigations emanates from two facts, the first of which is the hegemony of English as a

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global language of research and, hence, scholars need to gain fluency in the conventions of English academic discourse to understand their disciplines, to establish their careers and successfully navigate their learning (Hyland, 2009: 24). The second factor is the conflicting Sudanese policies regarding the position of English in university education in the wake of the mass Arabicization at College levels over the last two decades. However, such scholars as Braima (2004); Daffa Allah (2012) and Humaida (2012) revealed predominantly positive attitudes exist among Faculty members towards English which is still the customary language of research, especially in science and engineering schools. Indeed, these practices were tested in a pioneering study by El Malik and Nesi (2008) who analyzed ten medical research articles produced by British and Sudanese researchers and published in highly referred international journals. While both corpora conformed to rigorous editorial requirements, the study revealed minor but significant discoursal differences regarding use of hedging and nominalization attributes. Equally relevant is the Ph.D. thesis undertaken by Pitia (2003) who analyzed the linguistic features of author comments in science textbooks taught at The University of Khartoum. Another attempt to measure one metadiscoursal aspect post – Arabicization is Ali (2011) who compared employment of citation practices within 24 Ph. D. theses, equally represented by Geology, Geography and Applied Linguistics. While this study has unveiled the existence of ample variations in these conventions based on disciplinary clusters, it remains to be seen whether such variations extend to non-assessed academic discourse produced locally post-Arabicization under the rubric of metadiscourse which subsumes many of the above textual and interpersonal categories.

This Study

The context of this study is the academic discourse produced in English in the form of journal articles at The University of Khartoum, Sudan's oldest and most prestigious institution of Higher Education. Being a development of Gordon Memorial College established in 1902, this University was a witness to the inception of the field of ESP itself, as testified by the early establishment of The English Language Servicing Unit in 1970 which was headed in the mid-1970s by the famous ESP author, John Swales, who wrote his first book on scientific English there and initiated the publication of the journal English For Specific Purposes in The Middle East and North Africa (ESPMENA) (Swales, 2013: 117). Despite the official mass Arabicization of all teaching as of 1990, the strong Anglophone heritage is reflected in the fact that English is still retained as a medium of instruction in the Faculties of Medicine, Science, Agriculture and Engineering and as a lingua franca of research in twelve of the fourteen academic journals published at the University. The present study attempts to weave together earlier diverse strands of research, by exploring the concept of metadiscourse in its entirety in a representative corpus produced by Sudanese scholars within the country, and taking into consideration the disciplinary, generic and rhetorical factors of the Sudanese contex**t.** The study seeks to find answers to the following questions:

1. Are there variations in the manner different disciplines identify with their readers textually and interpersonally?

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2. How far is the employment of the subcategories of metadiscourse indicative of the disciplinary dispositions in the corpus?
3. Do the practices in the corpus reflect the tendencies observed in similar contrastive studies?

METHODOLOGY

The Corpus

The choice of the corpus was dictated by two considerations, the first of which was the journals currently publishing research at The University of Khartoum, and, secondly, the need to include a wide spectrum of knowledge domains. To meet both ends, our first choice fell on Chemistry, a pure natural field well represented in *Sudan Journal of Science,* published by The Faculty of Science, University of Khartoum and serving such specializations as Physics, Botany and Zoology. The second choice was an applied scientific domain, namely Civil Engineering, and this was given impetus by the presence of a regular publication; *Building and Road Research Journal.* The third field is Medicine which is representative of The Life Sciences, In fact, the medical field has a long – established publication, namely *Khartoum Medical Journal*. Regarding the second axis, we opted for Economy, which is, in a sense, equivalent to Chemistry in being a pure social discipline. Together with its sister domains such as Sociology, Anthropology and Political Sciences, it is included in *Sudan Journal of Economics and Social Sciences.* The second field is Applied Linguistics, which is our equivalent to Civil Engineering, in being a social field related to application of language to concrete life issues. This discipline is represented in *ADAB,* The Journal of The Faculty of Arts, which also accepts submissions by members of the fourteen other Departments including Geography, which is our third choice and, like Medicine, may have a peculiar disciplinary status. Until 2010Geography was part of The Faculty of Arts, but has since established its own Faculty (Ali, 2011).However, owing to its long past in The Faculty of Arts, and to maintain consistency, only those geographical articles published in *The Journal of Faculty of Arts* were included.

Having established the six journals, the next task was selecting a representative corpus for analysis of metadiscoursal features. To realize this objective, a number of considerations were taken into account. First, it was deemed that a number of ten articles per discipline would both be representative and amenable to detailed analysis. Second, we ascertained that the sixty articles were published in the last five years by Sudanese nationals. Third, care was taken to select only one article per issue and to ensure that no author is chosen twice. Finally, to ensure consistency of point of view, only those single – authored articles arguing from an original position were included.

The Classification Scheme

For the purposes of eliciting and quantifying aspects of metadiscourse, Hyland's (2005: 49) taxonomy, itself a refinement of his 1998 position, has been adopted, while retaining

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the duality of textual and interpersonal metadiscourse terminology. The subcategories are detailed below:

Textual Metadiscourse: It allows the writer to control and organize the sequence of discourse through anticipating the reader's knowledge of discoursal conventions and reflect the writer's opinion of how the text is to be interpreted. They comprise the following headings:

- Transitions, including additives, adversatives, and causative markers, are employed to indicate continuity, contrast or consequence in the flow of discourse.
- Frame markers demarcate text boundaries and elements of global textual structure, and configuration. They are equally vital in sequencing and indicating text stages, shifts and goals.
- Code glosses illustrate the restatement or reiteration of propositional content of the text.
- Endophorics knit together parts of discourse through highlighting prominent intra - textual relations, and, thereby, privilege certain interpretations of the text.
- Evidentials refer the reader to the textual sources used, mainly in the form of citations from the literature in the field.

Interpersonal Metadiscourse: It helps reveal the writer's personality, commitments and claims to being a credible member of the discourse community. In employing this resource, a writer unveils his attitudes and. the degree of involvement he has both with his audience and textual material. It subsumes the following categories:

- Hedges display the writer's desire to eschew from making categorical claims.
- Attitude markers reveal the writer's stance and appraisal of the conveyed information, be it in the form of importance, wonder, rejection or agreement.
- Boosters register certitude and render force to the propositional content.
- Reader engagement explicitly addresses and draws the attention of readers as participants in the text in the form of second person pronouns, question forms or interjections.
- Self-mentions convey the degree of author overt presence in the text in terms of first person pronouns and possessives.

Procedures

As a prerequisite to the examination and comparison of metadiscoursal features through the above typology, all instances had to be quantified through manual labor, since the application of concordance programmes to the diverse aspects of metadiscourse are notoriously difficult (Hyland, 2005; Lee and Casal, 2014). Subsequently, virtually every sentence had to be treated as having either a propositional or metadiscoursal function. As our interest lies with the latter, these had, in turn, to be assigned a textual or an interpersonal function, followed by a determination of which of the five types each category contained. While the majority of the cases were straightforward, there were dubious instances of multi – functionality, a fact that has bedevilled much research on

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metadiscourse. We can cite *in conclusion* in the following sentence, which can simultaneously function as a temporal transition marker, a frame marker and an emphasis hint:

In conclusion, increasing the number of beams had the effect of weakening shear strength. (Civil Engineering 5)

Alternatively, take the example of *widely* in the following excerpt:

Impetus for the huge post-graduate research produced in Sudan in the 1990s was the researcher's awareness of the writing difficulties. As *widely* acknowledged in the literature, writing is the most difficult skill to practice. (Applied Linguistics 1)

Apparently, studying the co- text, *widely* could be interpreted as an *emphatic* marker, justifying the attention given to writing research. Alternatively, it could be regarded as an *attitude* marker attributing a stance to the original authors, or may, yet, be seen as a *hedge,* qualifying the proposition. The multifunctionality could also be illustrated by items such as *e. g. ,consult* and *refer to* followed by references which aid the reader in elaborating the issue of the context, and could be classified as *'code glosses'* or may alternatively, refer to *evidentials* indicating the origin of ideas as 'sources'. The extracts below convey both functions at once:

Civic engagement is a framework for emphasizing the notion of citizenship, collective electoral participation and individual volunteerism in developing countries (*For a historical perspective, see, for example, Verba and Nie, 1978; Habermas; 1985; Putman, 1993 and Bowling, 2000). (*Economy1*)*

A simple, accurate, and specific HPLC method for quantization of the gabapentin in human serum using NBD-Cl as a fluorescent agent for chromatographic separation has been described (*For example, Tatar and Atmaca, 1989; Yigit and Ersoy; 1996; El Imam et al, 2003). (*Chemistry 9)

While precise classification is not always feasible, for the purpose of the present study, we followed other researchers like Hyland (2004, 2005) who assigned the elements to the category that appears to describe their primary function, taken to be 'code glosses' in the first instance, an evidential for the second and a hedge for the third. Moreover, to increase the reliability of the scheme, a total of twenty four articles, including four from each discipline were given to an independent rater who is a native speaker of English and a teacher of General English at the Foundational Year at Al Baha University, Kingdom of Saudi Arabia. After being presented with the typology, he was requested to re-score the items, and comparisons were subsequently made with the author's evaluation. An initial agreement rate of 88% was attained. At a later stage, recurrent cases of overlapping functions were discussed, thus enhancing the degree of consensus, while certain controversial cases were entirely left out of the analysis.

FINDINGS

The overall quantitative analysis of the six corpora has yielded 21420 instances of metadiscourse in a corpus of 329880 words The present average of 357 per paper or 64.9 per 1000 (an occurrence per every 15 words) does not lag far behind canonical studies as

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those by Hyland (1998,2004,2005) averaging the same per 1000 words and 373 per individual paper. The figures corroborate the impression that metadiscourse is an inherent aspect of successful academic discourse. The statistics in Table (1) reveal that, on the whole, the overwhelming majority of all cases (60. 4%; 39.2 per 1000 words) were of textual metadiscourse as compared to 39.6% or 25.7 per 1000 words for the interpersonal function. While a preponderance of textual metadiscourse is expected (e.g. Hyland found a proportion of 55.5% to 44.5% in his corpus),it could be argued that the discrepancy is more marked here. It is acknowledged that textual metadiscourse is crucial to explicating the propositional message and aiding the reader in navigating the macro-level organization of the text. In the present as well as many international studies, the density of transitions, evidentials and frame markers are uniformly high across all disciplines. Transitions constitute the largest category in the corpus (18%; 11.7 per 1000 words), barely falling short of Hyland's average of 19%.Excepting for Medicine. Equally, overall, Sudanese scholars are conscious of frame markers, as evidenced by their relatively high density (9.8%' 6.4 per 1000 words) which fairly exceeds Hyland;s average. Turning to code glosses, their overall density (8.9; 5.8 per 1000) is somewhat less than the standard in academic discourse Indeed, only Applied Linguistics and Chemistry reach the sizeable proportion of 10.9%; 7.9 per 1000 words and 10.1% and 5.8 per 1000 respectively. The striking aspect of evidentials is their relative density (12.8%; 8.3 per 1000 words) ranking second in textual category and exceeding the standardized norm worldwide. In fact, all six disciplines amply use this feature, though Civil Engineering and Chemistry moderately outstrip Applied Linguistics and Economy. As for the endophorics` category, one is immediately struck by their relative frequency (11%; 7.1 per 1000) which is roughly twice the figure found in Hyland's study, as it is in excess of 20% for Civil Engineering; 16% for Chemistry and well above 13% for Geography.

Clearly, the dominance of textual metadiscourse in our corpus points to a corresponding paucity in the employment of interpersonal elements. This is particularly true of hedging

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Table 1: Ranked Distributed Statistics of Metadiscourse Categories

Category	Total no of items	% of total metadiscourse	Items per 1000 words
Textual	12,938	60.4%	39.2
Interpersonal	8,482	39.6%	25.7
Subcategory			
Transitions	3,864	18.0%	11.7
Hedges	2,966	13.8%	9.0
Evidentials	2,733	12.8%	8.3
Endophorics	2,336	10.9%	7.0
Frame markers	2,095	9.8%	6.4
Code glosses	1,910	8.9%	5.8
Boosters	1,835	8.6%	5.6
Attitude markers	1,807	8.5%	5.5
Self-mention	1,314	6.1%	3.9
Reader engagement	560	2.6%	1.7
Grand totals	**21,420**	**100%**	**64.9**

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Though being considerably less in the present corpus, here as in Hyland's study, hedging was the only interpersonal category among the five top ranks. The category of boosters almost reenacts the above deviation from customary norms, though to a more marked degree. Always designated the smaller of the twain as shown in studies by Hyland (1998, 2004, 2008), this is not so in our case. The overall proportion to the whole statistics is appreciably larger(8.6%; 5.6 per 1000 words)**.**As for attitude markers, they constituted a wide margin of the overall statistics (8.5%; 5.5 per 1000 words) and significantly exceeding the figures in Hyland's study, largely due to their recurrent frequency in Economy (10%) and Applied Linguistics (8.9%) and not overlooking the fact that they feature strongly even in Chemistry and Civil Engineering. The first thing to note is its low density, ranking second only to the engagement category, and accounting for 6.1% or 3.9 per 1000 words of total metadiscourse, which is almost equal to Hyland's (1998'2001) studies. On the other hand, while self –mention (6.1%; 3.9 per 1000 words) approximated world standards, features like reader engagement (2.6%; 1.7 per 1000 words) was below the norm, to the extent of being almost negligible in the present corpus.

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Table 2: Percentages of Metadiscourse in Academic Disciplines (per 1000 words)

Category	Economy		Applied Linguistics		Geography		Medicine		Civil Engineering		Chemistry	
	%	per 1000 words	%	per 1000 words	%	per 1000 words	%	per 1000 words	%	per 1000 words	%	per 1000 words
Transitions	17.0%	12.6	22.0%	16.0	20.6%	12.0	12.0%	6.5	16.0%	11.0	18.4%	10.3
Frame markers	11.0%	8.0	10.0%	7.1	9.4%	5.4	11.8%	6.3	8.5%	6.0	7.0%	4.0
Code glosses	8.6%	6.2	10.9%	7.9	8.4%	5.0	7.8%	4.2	7.3%	5.1	10.1%	5.8
Endophorics	5.4%	4.0	5.0%	3.7	13.3%	7.9	9.5%	5.1	21.6%	15.0	18.5%	10.3
Evidentials	12.2%	9.0	12.3%	9.0	12.2%	7.2	13.9%	7.6	13.6%	9.4	12.9%	7.2
Textual	***54.2%***	***39.8***	***60.2%***	***43.7***	***63.9%***	***37.5***	***55.0%***	***29.7***	***67.0%***	***46.5***	***66.9%***	***37.6***
Hedges	15.6%	11.3	14.2%	10.4	11.0%	6.4	17.8%	9.6	11.8%	8.1	11.6%	6.4
Attitude markers	10.0%	7.3	10.9%	8.0	7.1%	4.2	6.1%	3.3	6.9%	4.8	6.6%	3.7
Boosters	7.6%	5.6	7.4%	5.4	9.8%	5.8	8.2%	4.4	9.8%	6.8	10.1%	5.7
Self-mention	8.8%	6.3	4.2%	3.0	5.3%	3.1	10.3%	5.7	3.5%	2.4	3.9%	2.1
Reader engagement	3.8%	2.8	3.1%	2.2	2.9%	1.7	2.6%	1.3	1.0%	0.8	0.9%	0.5
Interpersonal	***45.8%***	***33.3***	***39.8%***	***29.0***	***36.1%***	***21.2***	***45.0%***	***24.3***	***33.0%***	***22.9***	***33.1%***	***18.4***
Grand totals	**100%**	**73.1**	**100 %**	**72.7**	**100%**	**58.7**	**100%**	**54.0**	**100%**	**69.4**	**100%**	**56.0**

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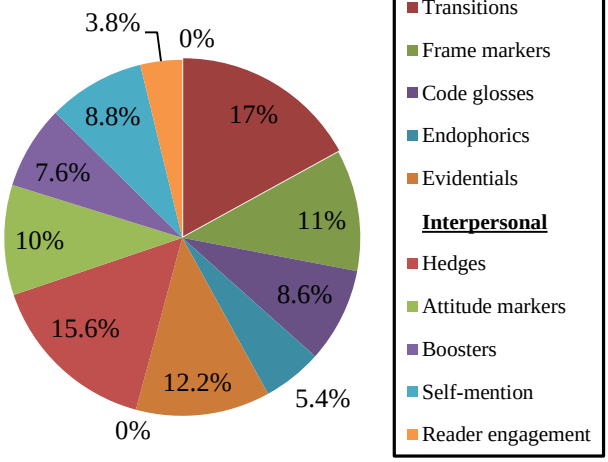
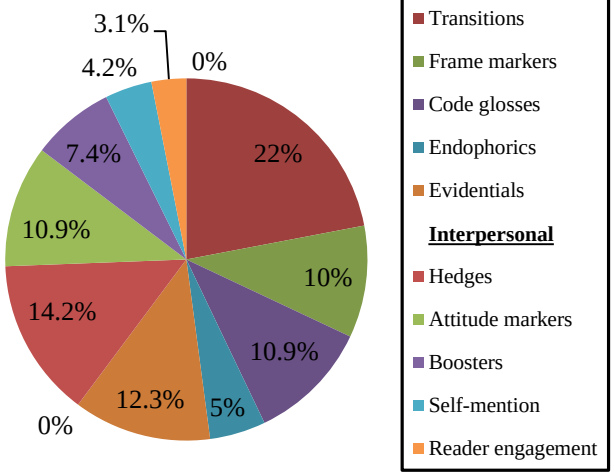
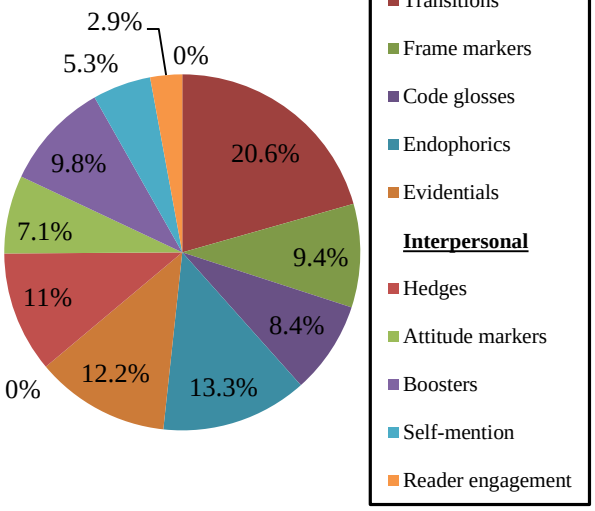
Economy



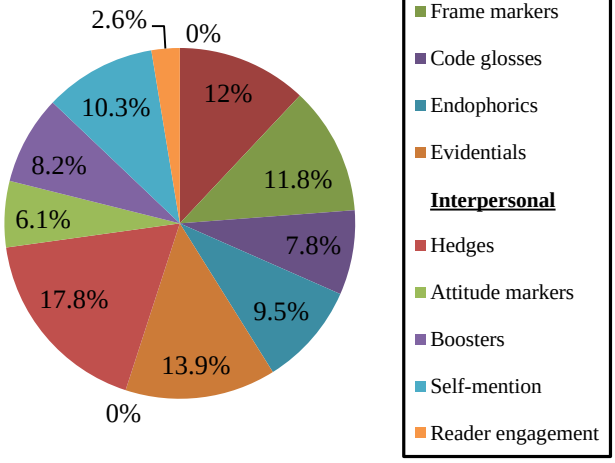
Applied Linguistics



Geography



Medicine



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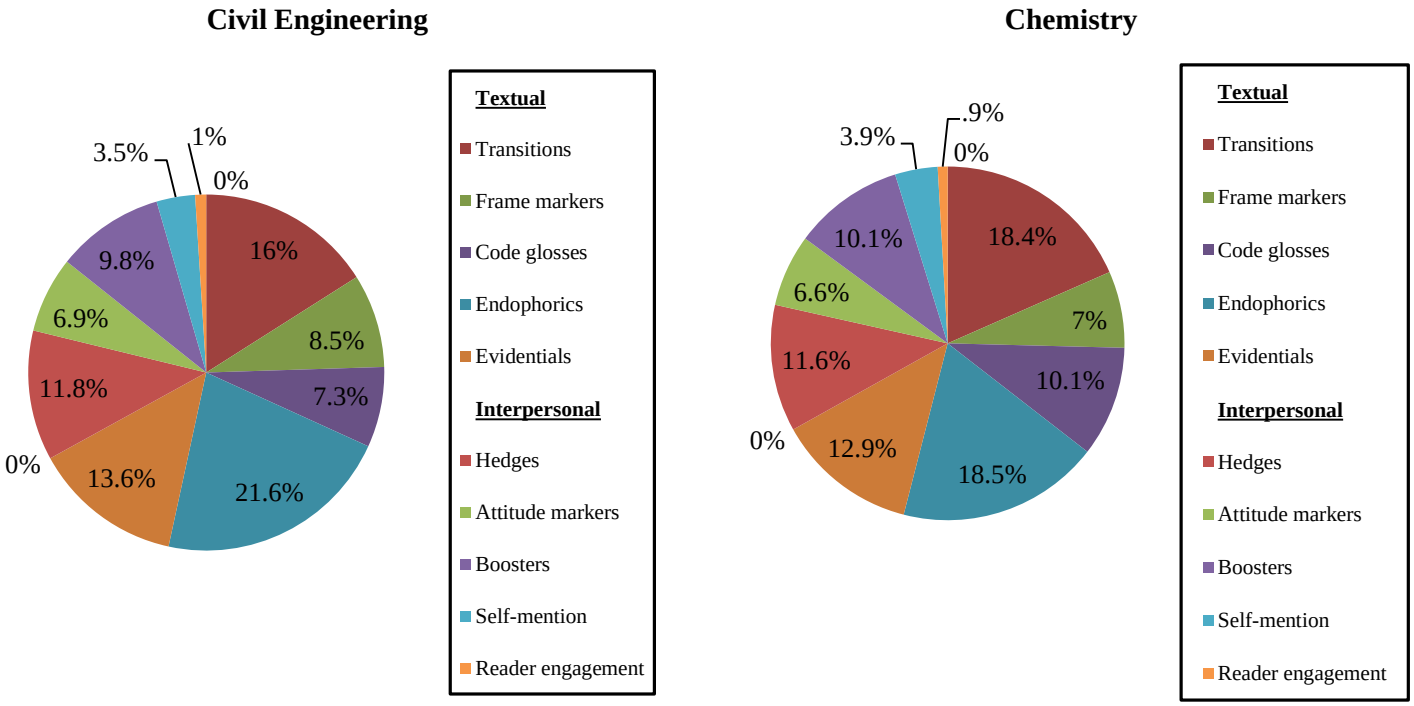

Figure1: Percentage Distribution of Metadiscourse Categories per Discipline

Measuring these statistics against individual disciplines, the ratio of textual to interpersonal metadiscourse is 67% to 33% in the case of Civil Engineering and 66.9% vs. 33.1% in the case of Chemistry., as underscored by the moderate use of hedging and the almost non-existent employment of reader engagement in both corpora (though the picture is further complicated by such facts as the unexpectedly high use of attitude category in both, and the heavy presence of boosters, especially in Chemistry, where they approximate hedging). However, it should be, once again, emphasized that roughly similar dualities in figures exist in Hyland's study of Astrophysics (64% to 36%). Economy has a ratio of 54.1% to 45.9% for textual and interpersonal functions respectively, figures that are only slightly less balanced for the statistics on the kindred marketing in Hyland's (1998) study. While the textual function is enhanced by widespread use of transitions, evidential and frame markers, the interpersonal function is underpinned by the moderately high use of hedging (15.6%; 11.3 per 1000 words), the abnormally high use of attitude (10.0%; 7.3 per 1000 words) and, finally, the heavy use of personal markers (8.8%; 6.3 per 1000 words). While the figures are similar between Economy and Applied Linguistics, the latter has a ratio of 61.2% to 38.8% for the two functions, partly due to the excessive employment of transitions (22%; 16 per 1000 words) as well as the halving in use of personal –mention. Regarding Geography, statistics assigns it an ambiguous place: on one hand, it has a division of 63.9% to 36.1%

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for the two functions, thus aligning itself to the sciences, as substantiated by its heavy use of endophorics (13.3%; 7.9 per 1000 words) and the correspondingly low use of hedging (11.0%; 6.4 per 1000 words). Yet, scrutiny of its use of transitions (20.6%; 12.0 per 1000 words) or boosters or attitudes brings It to the company of the first two fields. Medicine, too, partakes of both worlds: though regarded as a hard core, its statistics (55% to 45% for the two functions) rank only second to Economy in terms of due representation of the two typologies, and are, indeed, less by a hair's breadth. The moderate use of transitions (12%; 6.5 per 1000 words) together with the reasonably high employment of frame markers (11.8%; 6.3 per 1000 words) are partly responsible for this balance. Yet, it is the heaviest employment of hedging (17.8%; 9.6 per 1000 words) in addition to the most dense utilization of citation (13.9%; 7.6 per 1000 words) as well as self-mention (10.3; 5.7 per 1000 words) that renders Medicine the most unique among the six disciplines.

DISCUSSION

Having delineated some of the major statistical tendencies in the use of metadiscourse, it remains for us to seek plausible explanations. It would seem that ecological cultures may affect this aspect. For instance, transitions have been employed heavily in all disciplines except Medicine. Their particularly dense use in Applied Linguistics could be due to the fact that these students specialize in English and are overtly metalinguistically conscious of the structure of the language,, as indicated in an earlier study by Arabi and Ali (2014), where cohesive ties formed roughly a fourth of the fifteen linguistic devices employed by a sample of Sudanese English majors. On the other hand, the unexpectedly low use of transitions in Medicine may be dismissed as expressive of editorial predilections than disciplinary disposition. Likewise, self-mention is assumed to be abundant in social fields, as invoking a potent authorial persona and effective engagement with one's audience are valuable in fathoming the tenuous and contingent variables (Hyland, 2001:216). However, such a view ignores idiosyncrasy and community conventions among applied linguists in Sudan who traditionally tend to shun overt authorial presence, as proved by its very low profile (personal communication). In the same vein, with the exception of Applied Linguistics, all the other five corpora display significant employment of the endophorics feature. This abundance could be partly explained through the choice of the disciplines which are predominantly numerical in nature, concerned as they are with calculation, computation, tabulation and summation of statistical data and formulas. While this description cuts across disciplinary boundaries from Geography, Chemistry and even Economy, it is particularly apt for Civil Engineering which is concerned with application of engineering principles and mathematical models to the construction of urban facilities.

While the above idiosyncrasies could be true, linguistic features of discourse are increasingly seen to be linked to community consensus and socially sanctioned discursive practices (Hyland, 1998: 448). The broad dichotomy between hard sciences and soft social fields is largely applicable to this corpus. The former, epitomized by Chemistry, Civil Engineering and, ostensibly, Medicine, are defined by their specialized readership,

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linearly-built and cumulative growth of quantitative and largely replicable knowledge uniformities and closely defined research niche. A diametrically opposed picture emerges from Economy, Applied Linguistics and Geography, where a multiplicity of variables are involved, where there is more human agency, less exactitude and predictability, and where dispersed threads of knowledge have to be woven together and a common epistemological horizon to be forged out of the divergent subfields (Becher and Trowler, 2001; Coffin and Burns, 2003; Hyland, 2006). Indeed, it is the widely shared epistemological and procedural assumptions in the hard field that may partly explain the fact that their overall use of metadiscourse resources is roughly half what it is for the soft ones, as well the disproportionately lower ratio of interpersonal metadiscourse in relation to the whole.

The most obvious duality between the two *tribes* is the "reader engagement" category, which is employed to establish rapport with the reader or to, enlist sympathy and indicate that the discussion is made with a potential reader as the ultimate goal. It is to be noted that in all of the six disciplines this aspect has featured the least, and, hence, constitutes the lowest ranking category. It is further worth noting that this feature, meager and predictable in realization as it is, exhibits the conventional division between soft and hard fields, partly justifiable on account of the interdisciplinary nature and diffuse readership of these fields. Indeed, two-thirds of all cases are confined to Applied Linguistics and Economy, while Civil Engineering registers only 34 cases and Chemistry a mere 20. Nowhere is appeal to a "collegial" spirit in the soft fields more evident than in the rather extensive use of inclusive *we* by single authors who in so doing presuppose a common perspective. In the examples below, as throughout the discussion, ECO stands for Economy, AL for Applied Linguistics, GP for Geography, MD for Medicine, CE for Civil Engineering and CHEM for Chemistry. The accompanying number refers to which of the ten articles the quotation is from.

Here *we* come again to Gidden's structuration theory. (ECO6)
We have so far discussed the socioeconomics of Halfawiyyin migration to Khartoum.(ECO2)
We will now cite more evidence from amnesics. (AL4)
Let us apply the Garch model to the fiscal data. (ECO7)
As *we* have seen, illocutionary acts are replete with meanings. (AL6)
We shall now proceed to give examples of semantic criterial features. (AL3)
When *we* consider the accuracy of climatic regions, *we* find noticeable discrepancies. (GP1)
To investigate presence of stochastic trend, *we* employed augmented Dickey-Fuller tests. (ECO 8)

There are occasions, especially in soft fields, when researchers assume the position of argument exponents who would take their conclusions to be similar to those of the reader too, as in the following examples:

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It should be realized that the adjustment process of equilibrium… (ECO9)
One can thus establish a link between degradation and overgrazing. (GP6)
As expected, the order of areas under the ROC curves of measurement.. (MD3)

More commonly, researchers in Economy and Applied Linguistics would rhetorically address reader in imperative form to engage attention and involve readers, in contrast to terminological positioning premised upon shared understanding in the scientific domains. Below are some examples:

But what is it that linguists mean by the concept of *text*? (AL1)
*Assume tha*t K is the coefficient of earth pressure at rest(CE3)
The global emission inventory estimates that about 8 million of organic carbon are emitted (*See Fig. 8*). (CHEM19)
Are words in political speech primarily used to convey emotive meanings? (AL7)
But why is volatility risk estimate analysis needed after 2008? (ECO5)
Refer to Chart (4) for estimates of precipitation levels in Sudan in El Nino years. (GP6)
Note the common suggestion that prolactin is diabetogenic. (MD1)
Consult Dumont (2009) for a comprehensive description of riverine hydrochemistry. (CHEM 10
Consider the implications of GIS paradigms on the scope of Geodetics. (GP8)

Turning to self-mention, it is a feature that has undergone many vicissitudes during the last two centuries. Indeed, the intrusion of the author in scientific research was often censured as it was presumed to interfere with the unmediated narrative of nature. Since the concrete expression of this ideology i.e. eschewing the use of first person is no longer sacrosanct in international academic discourse, it would be intriguing to see how Sudanese scholars handle this issue. The first thing to note is its low density, ranking second only to the engagement category, yet almost equal to Hyland's (1998, 2001) studies. However, there are ample variations, with this aspect comprising ten per cent of all metadiscourse cases in Medicine, which significantly outnumbers Economy. This is contrast to Chemistry which contains merely 85 cases, and fewer still for Civil Engineering with its 113 occurrences of this aspect. The dearth of this feature is the more striking in the knowledge that almost all cases of self-mention here are of the self-citation type, as we will see shortly. As the examples illustrate, self-mention was employed to elucidate methodological underpinnings adopted by the researcher and establish a credible disciplinary expertise (a) as well as to demarcate both the objectives and global structure and goals of their research (b) and, finally, announce the outcome of one's unique contribution to scholarly endeavor (c):

(a)
Several DEA models have been proposed, however, *we* use an alternative efficiency framework by Cooper. (ECO6)
We have conducted discrimination analysis to condense 14 measurements. (MD3)

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As part of kinetic studies on biological systems, *we* report on the thermodynamics of pencillinase. (CHEM4)

Quantification was not enough because *we* needed to observe what and why in order to measure (GP2)

We propose a two-dimensional axisymmetrical finite method. (CE4)

We described how we managed to establish a cluster of P. orientalis. (MD8)

b)

I have so far discussed aspects of comprehensible input. (AL10)

I start with the distinction between explicit and implicit neurological stemming. (AL4)

In this section, *we* present an open macroeconomic model (ECO3)

c)

In this study *we* have shown that patients with congenital hypothyroidism constituted 26% of (MD7)

Our conclusion is that allocation of equity finances should be… (ECO8)

Working towards IMW, *I* experimented with 158 Arab students. (AL2)

I have demonstrated that remote sensing is valuable in Funglands. (GP5)

Equally intriguing is authors citing their own previous research within the sentence or a superscript note. Self- citation can serve the function of self-promotion as well as enhancing expertise and confidence. Also, by citing their own work, researchers present credentials as expert members of the discourse community through highlighting their contribution to the disciplinary heritage. It equally contextualizes and situates ones' current concern within the larger disciplinary framework and, hence, displays an engagement with ones' professional peers, according to Hyland (2001:213). Indeed, in that first major study of self-mention in academic discourse, Hyland was struck by the relative frequency of self-citation in his corpus, occurring in 70% of all papers, and constituting 8% of all cases of self-mention. Furthermore, Hyland (ibid) found that self-citation had a rate of 13 cases per paper in Biology and that it comprised 11% of all self-mention reference in Engineering. His explanation for the heavier use in science relates to the cumulative, progressive and linear growth of knowledge which define research contexts. In addition, heavy investment, technical expertise and capability needed often coerce scholars to concentrate on a tiny and continuous niche of interests. Concerning the Sudanese corpus, it was obvious that self-citation is the least represented aspect of self-mention (though it accounted for most of the 85 occurrences of overall self-mention in Chemistry). It is plausible to assume that the fragmented and largely individual nature of research enterprises in Sudan would render extensive and cumulative research (and, hence, self-citation) improbable. While statistics for self-citation in Medicine cannot be verified due to its use of numerical citation systems, our prediction is confirmed by the moderate use of this feature, as in the following examples:

Many studies confirmed that *Argel* had numerous remedial effects against cancer (*Hanafi and Mansour, 2010*). (CHEM8)

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An earlier soil-culvert finite programme *developed by Mohamedzein (1999a)* was further modified. (CE4)
Sinada and Abd Al Karim (1994) presented detailed work on the water characteristics of The Blue Nile at Khartoum. (CHEM10)
This paper is an extension of the expansive soil model *advanced by Abd Allah (3).* (CE2)

Understandably, there were rare cases in the more social fields, even in Hyland's study, due to the dispersed nature of research strands and their remoteness from immediate concerns, as shown by these examples:
As *I* indicated elsewhere (*Eltayeb, 1995:187*), the crux of Kantian Geography is…(GP2)
We proposed an adapted fiscal aggregate model (*Mohammed and Ali, 2005)* to Northern States. (ECO6)
As argued earlier in Abdalla (2000), a considerable body of Sudanese writing research suffers from…(AL1)

Employment of citation permeates academic discourse, and is often seen as its single most defining feature (Swales and Feak, 2012). A plausible explanation for reliance of hard fields on intertextuality, found most palpably in citation of sources, is their need to anchor their research in a larger disciplinary framework of shared communal knowledge through drawing innumerable extra-textual references to the literature prior to offering their own contribution that addresses a niche in knowledge. A demonstration of familiarity with the disciplinary heritage also vindicates one's status both as a humble and expert member of the discourse community who is entitled to forward well-grounded original proposition, emanating from the current state of knowledge and embodying the ongoing "conversation of the discipline", according to Charles (2006: 311). Building on the initial Swalesian (1990: 50) distinction between author-prominent integral citation and author-evacuated non-integral citation and discourse and cognition versus factive reporting verbs, scholars such as Hyland (2002); Thompson (2005) and Samraj (2008) have analyzed the way writers in the reiterative and discursive humanities and social sciences employ different citation conventions from the linear and epistemologically predictable natural sciences to establish the respective ethos of their domains.

The results of our investigation concur with Hyland's (2002) full-length study on citation in which Astrophysics research articles had twice as much citation ratio as Applied Linguistics and the highest citation density was for the kindred Biology, which is unique among the sciences for its emphasis on intellectual property of original ideas and the urgency to relate research to prior theoretical underpinnings (Hyland and Tse, 2004:174). The dichotomy between the hard and soft disciplinary clusters is more pronounced in comparison of citation forms. Chemistry and Civil Engineering hardly ever employed quotation and have a predilection for non-integral multiple source citation, an aspect rendered more visible by the numerical citation system employed in Medicine. Geography is idiosyncratic, as it shares some quantitative subfields and partly parodies sciences like Geology in subordinating authors and foregrounding phenomena through non-integral citations (Ali, 2011). But, Economy and Applied Linguistics are in

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diametrical opposition to the former fields in preferring verbatim quotations and integral citations, usually introduced by discursive and mental denotative verbs. While citation is an intricate aspect, space only suffices for some illustrative examples:

Gumperz (1982: 59) describes code-switching as "the juxtaposition within the same speech exchange of passages of speech …..". (AL5)
Senbet, and Sorge (2000) argue that for explicit deposit insurance to sustain financial stability it has to be accompanied by… (ECO10)
Forecast models can ameliorate drought cycles in The Sahel region in El Nino years (*Gundury et al, 2007; Siri et al, 2009*). (GP4)
Phenolphthalein alkalinity was not detected at any time in the aqueous sample; the total alkalinity (Walling, *2007; Hurst, 2011; Ntobing '2012*). (CHEM8)
It has been reported in the literature *(Hegemann, 1988; Spertmann, 1991 and Sangletan, 1997*) that CPT can be used as a preliminary procedure for ……. (CE1)
Analysis and design of subterranean tunnels is usually based on simple models using stress bearing (*e.g. Hughes et al, 1985; Bouassida, 1995; Meyerhof et al, 1996).* (CE10).
Short maternal stature may be associated with an increased incidence of obstructed labor due to cephalopelvic disproportion (*5, 6, 7*). (MD9)

As for code glosses, it is the profusion and form of this category that demarcates the soft fields from the hard ones. In fact, in Economy and Applied Linguistics in particular, authors tend to emphasize, italicize or bracket off verbal constructs, terms or models inside or outside citation contexts, as being the point of discussion in themselves, thus stressing the discursive nature of these fields. Such function is less in Geography and hardly employed in the scientific fields, which characteristically explicate difficult terminology or instantiate methods or procedures, as below:

The maximum precipitation coincides with the core of Easterly Jet Stream *(i.e* 300 to 600 km south of Intertropical Convergence Zone). (GP6)
Equilibrium conditions result in emergence of various factors ….. *In other words,* the moisture cycle... (CE5)
The antibacterial activity of the enantiomers is affected in proximity to the quinolones nucleus, *e.g*. at the position N-1 or C-7. (CHEM7)
The cutoff point was found to be 0.284, *that is,* any subject whose DAS is less than 0.284 is…(MD3)
Symptoms related to the autonomic nervous system *such as* postural hypotension, atrophy. (MD1)
The term "*settlement patterns*" refers to modes of geographical occupation..(GP5)
Since writing never repeats speech, a written text shapes on paper until it is "*sounded*" by the reader. (AL2)
We can use Lukac's concepts of *"unity of theory'* and *'praxis*" to emphasize…(ECO1)
Musen and Squire (1993) presented amnesic with novel compounds as *gumpark* and *jamdir*.(AL4)

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The use of attitudinal affect in the experimental fields generally reflects an evaluation of phenomena, methods and procedures and draws attention to issues the writer deems important for appreciating the propositional content, seen as springing from experimental procedures. The expressions only convey evaluation in an detached manner and principally build on shared disciplinary schema. This can be illustrated through some examples from the corpus:

Some *useful* hydroaxmic extractions include vanadium (CHEM2)
Effective cone resistance was obtained by subtracting pore water pressure. (CE1)
A pretensioned girder *must be* utilized to support bridge deck slabs. (CE5)
Brain CT scans are *crucial* investigations for uremic neurological.(MD4)
Finite models *can be considered superior* to simple analysis because… (CE3)
Universal Loss Equation Model is the most *well-known* empirical measurement. (GP8)
GEM are *relatively new* flouroquinolones compounds. (CHEM2)

In contrast, researchers in Economy and Applied Linguistics and, to a lesser extent, Geography and Medicine, had wider options in that they had much the same repertoire of epithets above, as indicated by the three instances below:
Pareto Fat Tails give *satisfactory* results, but shorter forecasts. (ECO7)
Though there is *voluminous* research on VLS, classifying VLS remains controversial. (AL9)
A pragmatic referential model *immensely enriches* our knowledge… (AL4)
A *more sophisticated* and *nuanced use* of the erosivity factor was made by Bergissma (GP5)
Thornthwaite's thermal ratio *sufficiently* accounts for evapotranspiration factors. (GP1)

Alternatively, writers in the three social fields could express their personal perspectives in much more emotive language and to a degree never granted their fellow science researchers. This profusion of emotion is largely condoned because of the role of personal judgment in the interpretation of multiple variables in social fields. Yet, it is to be noted such attitudes are far less in Geography, while numerous cases occur in Medicine the length to which these researchers in these fields can take to express themselves (even employing unmitigated appraisals) is illustrated in the examples below:

Structural descriptions *pay only lip service* to communication. (AL1)
Sadly enough, we cannot account for state dividends in terms of (ECO4)
Spears' geographical conception of agrarianism can be *dismissed as…*(GP5)
Inappropriate methods rendered Geography an *apologetic* and *conformist* discipline. (GP2)
This spirometric technique accurate compared with other, but it *fails* to reach 100% sensitivity. (MD7)
Potential future treatment of infertility must focus on immune-modulation of the *culpable* cells. (MD10)

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Due to its *insidious* etiology, congenital hypothyroidism is usually diagnosed late. (MD4)
Even more interesting are the findings on perceptual priming (AL4)
Code- crossing, as Rampton *insightfully pictures*, *involves* a sense of identity. (AL6)
Ideally, we should account for state differences in terms of cost of services (GP3)
Verba's *seminal* work on mass participation.. (ECO1)
The name 'idiophathic primary" is *unfortunate*, as it *undermines* comorobidities of obesity. (MD5)

In contemporary accounts of the characteristics of academic discourse, the concept of hedging is increasingly acknowledged, as it replaces the hallowed notion of scientific writing imparting largely transactional knowledge by one premised on the interactive nature of construction of knowledge. The belief in objective unmediated facts is currently taken up by acknowledging that scientific knowledge is a blend of more or less credible claims that depend for their ultimate ratification upon the reader. The notion of hedging allows the writer to express his claims with due accuracy circumspection and humility ranging from potent statements to non- committal and unproven claims. Yet, in our corpus, the traditional distinction between social and natural fields is blurred. The former characterized by the greater need for interpretation, delineated argumentation and personal judgment to evaluate largely qualitative data. Though hedging tends to be less in the sciences, this is unusually accentuated in Chemistry, Civil Engineering, and even Geography, where in all three it approximately constitutes only a tenth of all metadiscourse cases. In fact, in blatant violation of academic norms, in Chemistry hedging is almost overtaken by boosters. Medicine, however, almost approximates normal figures.

Concerning hedging types, following the tripartite agency of knowledge (i.e. content, the writer and the readership), Hyland (1996: 440-441) offers a parallel classification of hedging into accuracy, writer-oriented or reader-oriented types. Reader-based hedges constitute a fraction in the corpus and are dealt with under the rubric of self-mention markers However, of the divisions of accuracy hedges indicating the correspondence between a proposition and reality, the most pertinent here are *attribute* hedges. These utilize the notion that, to be accepted, objective, knowledge needs to be represented in conventionalized semiotic schema. However, as Hyland (ibid) points out, there is sometimes a disjunction between presumed models and parameters, on one hand, and experimental results and actual behavior, on the other. Using attribute hedges, writers can approximate their conclusions and findings against a reified set of categories, relationships and measurements for greater precision. Like Hyland (1996, 1998, and 2004), these were abundant in the science fields in the present corpus, as in the examples below:

Increased GER *can* lead to an increase in urine secretion from an *upper limit* of 150 mg to *approximately* 250 gm per 24 hr. (MD6)

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As the capacity of the embankment sequences was *virtually nonexistent*, consolidation settlements (CE3)

The *small* and *almost* constant difference between the two enthalpies *may* be due to *relatively* weak ionization. (CHEM1)

Although endotheliosis is believed to resolve *completely* after delivery, preeclampsia *may* leave permanent damage. (MD9)

A *significantly lower* number of obese women delivered vaginally compared to women with *normal* body mass. (MD3)

Numbness and tingling sensations were *probably* related to *high* blood toxins. (MD7)

HLA-G is *strongly* expressed in the first trimester and *gradually* decreases throughout pregnancy. (MD9)

The *relative* density of a soil in this model is based on the *greatest likelihood* of its clay classification. (CE10)

Generally, fluoroquinolones are *fairly* insoluble in water. (CHEM4)

Strain parameters *crucially* govern stone-columns behavior (CE5)

The values remained *almost* unchanged, although *appreciable* concentrations of PO4-P were maintained (CHEM8)

In contrast, *writer-oriented* hedges allow writers to perform the dual function of placing their claims within a larger disciplinary framework and forestalling criticism and opposition through minimizing the degree of their commitments to their claims. According to Hyland (ibid), *writer-based* hedges are associated with evidential verbs including *appear* and *seem* to bestow a degree of commitment to statements. More significantly, judgmental epistemic verbs such as *predict*, *propose* and *assume* are often used as abstract rhetors which normalize personal projections. Hence, by thematizing inanimate elements of research, they are assigned the main responsibility and an anthropomorphic agentivity for initiating (a usually) discursive or cognition acts. Examples below illustrate this:

The figures *suggest* that oil revenues barely met… (ECO 6)

The study *proposes* a strategy to heighten the sensitivity of Arabic translators to(AL2)

This paper *argues* that dialectical Geography immensely broadens (GP2)

The model *indicates* that, given minimal capital flow, equilibrium….(ECO9)

Intravenous immunoglobulin *seems* to reduce over expressed Th1 (MD3)

The paper *states* that there is no universally applicable climatic classification. (GP1)

Randok speech *tends* to draw on phonological rhythmicality. (AL5)

Other strategies for diminution of authorial responsibility is through the use of clausal subjects which are sometimes employed in, passive constructions. The tendency is also common in Medicine, as below:

It would be legitimate to argue that Sudanese post-graduate research(AL1)

This lactotroph hyperplasia is *believed* to be secondary to multiplication of pre-existing mature lactotroph. (MD7)

Higher returns *are associated* with fatter tails compared to.. (ECO4)

CRF *is characterized* by progressive irreversible Sclerosis and loss of nephrons. (MD4)

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It appears that the subjects manifestly learned… (AL9)
It has been suggested that activated NK cells produce cytokine antibodies. (MD2)
It is assumed there is a quasi-fixed rate exchange denoted as… (ECO 7)
It Is implied that land tenure systems in Southern Kordofan are better… (GP10)

If hedging is intended to withhold personal commitment to statements as a protective and face-saving measure, we need to consider the related feature of boosters, those lexico-grammatical features imparting a sense of conviction and certitude in readers. According to Hyland (1998: 238) these certainty markers allow the writer to project a credible image of authorial entity and conviction. Since writers oscillate between mitigation and assertion, it might be claimed that hedging and emphasis are the indivisible twain of interpersonal discourse markers. Given the contingent status of much epistemological claims, the balance tips in favor of hedges. A long-standing belief among scientists was that since natural sciences conveyed only categorical truth, emphatic markers were by necessity redundant, but studies of sociology of knowledge have increasingly shown that writers occasionally exploit consensual beliefs in the discourse community to present their unique contribution. This is particularly crucial when new findings are reached through deductive reasons so much so that writers feel the strength of their position entitled to rhetorically use boosters *e* to forcefully announce their findings and achieve their ultimate communicative goal of academic persuasion. However, disciplinary variations seem to be inapplicable, as in all six disciplines boosters claim a larger ratio compared with its kindred hedges. The approximation of the duo in Medicine brings it closer to the social fields, whereas a halving of the same density in Geography is reminiscent of natural domains. Yet, a distinction emerges between the use of this feature between scientific and social fields. In the former, emphasis is almost always drawn from the finding factive research category, while in the latter this is interspersed with more colorful cognition verbs and individual assertions, as shown by the instances below:

The present study *demonstrated* that prolactin increases progressively from the first trimester …… Moreover, our study *revealed* that there were no significant differences (MD1)
Based on the previous discussion, *it can be concluded* that fissures in the bottom flange near girders (CE5)
The suitability of flumequine as *is corroborated* as it is well resolved from the analyte peaks. (CHEM2)
The excellent agreement with the buffer solutions *gives confidence* to the present procedure. (CE8)
A capillary zone electrophoresis was *established* f or the determination of… (CHEM6)
The figures *confirm* that the initial pedological state influence the overall… (CE1)
Following the principles of The Lexical Approach, vocabulary is an essential skill. *Indeed*, there is a consensus that vocabulary is part of communicative… (AL10).
The findings on decoupling features *is a further testimony* to usefulness of cyclic depression models. (ECO10)

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It was *unequivocally shown* that in-migration patterns in central Sudan are inseparable from… (GP6)
This *very* conception of phatic communication was *reached* in similar studies. (AL7)
It is *well- attested* that in countries with improper regulatory safeguards and explicit deposit insurance…. (ECO5)

Pedagogical Implications

This study has investigated the overall employment of metadiscourse in an interdisciplinary corpus of Sudanese research articles post- Arabicization. The results confirm the seamless nature of metadiscourse as a binding means by which writers best designate and contextualize their messages and provide the clues by which professional peers can decode and engage with the propositional content. Equally, the inextricable link between discoursal manifestations and the recurrent practices of professional and academic communities has been established for this study. It would seem that overall use of metadiscourse is consistent with disciplinary clusters. It was thus observable that Economy and Applied Linguistics had greater densities as a whole as well as more concentrations in the realm of transitions, code glosses, frame markers as well as boosters, attitude markers and reader engagement. On the other hand, the predilection Geography has for more neutral attitudes and terminological exegeses, its overwhelming use of author- evacuated non-integral citations in addition to proportionately lower reliance on author intrusion or reader invocation sets it apart from the two other almost convergent fields. Indeed, due to their inherent discursive signaling, analyses of metadiscourse features not only unveil writing practices, but also illuminate and vindicate many of the issues of disciplinary taxonomies and allegiances. The deviant behavior of Geography may be a case in point. As a discipline, Geography essentially attempts to understand the causes and consequences of spatial organization and material character of Earth's surface (Murphy, 2006: 4). Sharing its hard core of physical Geography, Geomorphology and Climatology with such fields as Geology, Surveying and Chemistry, geographical subfields such as Demography, geopolitics and Environmental Geography equally share and borrow from social fields such as Economics, Sociology and Ecology. The highly interdisciplinary and synthetic nature of geographers' interests had led some scholars (e.g.Abler et al, 1992: 5) to suggest that Geography is not a disciplining but, rather, a set of concepts, models and theories that geographers bring to their research. Indeed, the uniqueness of this field was confirmed by the decision in 2010 to separate Geography from The Faculty of Arts, University of Khartoum and to establish The Faculty of Geography and Environmental Sciences (Ali, 2011). It was noted that, in view of their myriad affiliations, Sudanese geographers publish in such wide-ranging venues as *The Desertification Research Institute Newsletter, The Journal of Faculty of Agriculture*, *ADAB* or *Bulletin of Environmental Studies Research.*

The ambiguous nature of Geography is mirrored in Medicine, as borne out by the metadiscourse figures, standing in contrast to the dispositions of Chemistry and Civil Engineering which were similar and largely consistent with relevant studies on sociology

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of knowledge. Despite the former being a pure as opposed to an applied field, they are convergent in their incremental core, seen in dominance of the textual function and their predominantly empirical, depersonalized and disengaged schematic reference. This sets them apart from Medicine, characterized by more emotive attitudes, interest in intellectual property and projection of a textual voice expressive of incontingency in knowledge claims. In fact, these characteristics may have to do with the peculiarity of this scientific discipline. The life sciences, including Medicine deal with the physiology of all activities of living organisms, particularly with all cellular processes, including those of the genome. These functional processes can ultimately be explained purely mechanistically by chemistry and physics. True sciences like Chemistry and Mechanics are based on observation and experimentation with outcome that are falsifiable, universal and generalizable over time and space. While laws certainly play a role in theory construction, there are reason for their lesser importance. These include the greater role played in biological systems by chance and randomness, the complexity and uniqueness of a high proportion of phenomena in living systems in contrast to inanimate matter, as well as the fact species are richly endowed with such capacities for reproduction, metabolism, replication, regulation, adaptability, growth, and hierarchical organization (Mayr, 2004:43). This is incomparable to the immanence and reductionism of mechanical or chemical theorems. To avoid this, historians of science tend to use the term *descriptive* sciences of Life Science, treating them as *provincial* sciences since their explanatory power is more finite than proper sciences such as Chemistry. One might contend that some aspects of use of metadiscourse have vindicated the peripheral position of Medicine in Smith et al's (2000) *hardness* axis.

While patterns of metadiscourse are consistent with global scholarship, many inconsistencies, particularly those pertaining to interpersonal aspects have been noted. To take examples, the unduly large proportion of endophorics in the corpus may not be representative of customary global practices, as is the correspondingly low use of self-mention in Applied Linguistics, in particular. Inaddition, the corpus as a whole can be characterized as *writer-responsible* (Hinds, 2001) in its relative oblivion to the reader, as shown by excessive consciousness of macrostructure, overt textual cohesiveness and verbal rendition as compared to the paucity of reader engagement and hedging, particular. Indeed, the Applied Linguistics, Geography, Civil Engineering and Chemistry writers can hardly strike the balance between detachment, appraisal and certainty essential to presentation of facts. The dearth of hedging and the surfeit in use of boosters is a common feature of the corpus and may have roots in Arabic contrastive rhetoric models. These tendencies are more prominent in Chemistry, as exemplified by the following excerpt:

Moderate concentrations of substrate (n-propanol) and low concentrations of ferrous sulphate catalysts were added. It was shown from the trial and error logs that the reaction is first order in hydrogen peroxide. The plots of hydrogen peroxide concentrations were observed versus time were straight lines, and their slope yielded pseudo-first- order rate constants k observed. The order of reaction with respect to the sulphate catalyst was determined by varying the concentration and keeping other

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variables constant. The plot of k observed against the concentration was a straight line through the origin for both alcohols. The first order dependence of rate on concentration was confirmed and that there is no reaction in the absence of ferrous sulphate. (CHEM2)

In its attempt to draw an agentless, self-sufficient and universalized scientific model based on induction, verification and certitude, the writer presents a superseded positivistic paradigm that has been replaced in recent sociological accounts (and research writing, in practice) by knowledge as socially constructed entity, in which the persona of whose authors and audience are no less crucial in determining what is *normal* science.

It could be argued that many problems in academic linguistic proficiency are peculiar to the Sudanese milieu. In fact, in the absence of many of the bonds and shared means of communications, Sudanese academic communities can hardly qualify for the proper Swalesian (1990, 2004) conception of a discourse community. Due to both the political insularity of Sudan and its fragmented and impoverished academic environment, the researcher deems the term *legitimate peripheral participation* (Lave and Wenger, 1991), as a more convenient description for such scholars who have cultivated their own academic conventions within their local publications. This is exacerbated by the duality of medium of instruction and the common view of academic discourse as monolithic entity undifferentiated on the basis of rhetorical or disciplinary contexts (Ali, 2011). Moreover, as indicated by Alhassan and Holi (2016), mastery of academic skills is still widely held in The University of Khartoum to be an individual enterprise in continuity with the strong Anglophone legacy of The University. While the context of the two authors was the challenges facing Ph.D. candidates writing in English in the University, their conclusions are also pertinent to academic discourse. Both types are not explicitly taught and no guidance is offered and it is doubtful whether contemporary concepts such as *genre analysis*, *EAP*, *social constructionism*, *corpus linguistics* and *disciplinary discourse* are current among teachers of English. In the case of research, it might be termed *writing by intuition* (original emphasis), though some ameliorating factors might intervene such as studying abroad, the heritage of the University and individual endeavors to keep abreast the world through conferences and publication venues. This is generally true of Medicine in which the density for hedging, self-mention and attitude markers approximate those of similar global scholarship. In addition to the prestigious status this field has traditionally enjoyed in Sudan and its attraction of many intelligent students, the embracing of shifting modes of discourse by the local and cohesive discourse community is as important. In fact, *The Khartoum Medical Journal* is probably the most progressive publication scrutinized by this study. While commending the efforts of the present sample, it is clear that Sudanese scholars must be granted the opportunity to accommodate and contribute to global scholarship to enhance the quality of their research. This would involve bypassing mere linguistic competence, and realizing the roles of generic and disciplinary conventions as well as potential readership and issues of ideology and agency in shaping academic discourse. Moreover, aspects of Anglophone discourse, including moves, citation, schematic structure and metadiscourse must be explicitly taught to prospective researchers in special courses by proficient EAP teachers in conjunction with scholars who have published in highly-ranked journals in the West.

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Only then will local scholars be alerted to the dynamic nature of academic publication and the manifold considerations to take into account to satisfy the gatekeepers. This will ultimately be positively reflected in both their local research and their prospects as full-fledged international scholars.

CONCLUSION

The issue of metadiscourse within academic discourse is invariably traced to the influence of the social constructionist view of scientific knowledge, which replaces the notion of the primacy of incontestable facts by one that recognizes the role of discourse communities and consensus in the constitution of what is legitimate knowledge. More recently, the acknowledgement of the politeness strategies employed by writers to persuade readers was given impetus by developments such as genre analysis and disciplinary variations in the way different tribes mould their discursive practices to forge their unique epistemological beliefs. In the present study, building on prior models, we endeavored to assess both the disciplinary variations and rhetorical resources employed by Sudanese scholars in six disciplines, represented by ten research articles for each, and encompassing the hard-soft knowledge continuum. In many ways, the results replicate the familiar dichotomy. For instance, the heavier use of both metadiscourse resources and interpersonal features in Economy and Applied Linguistics in contrast to the relative scarcity in many interpersonal and overall incidence in Civil Engineering and Chemistry was predictable enough. Other aspects such as the unusually low density of hedging, reader engagement and self-mention, especially in Chemistry, calls in for pedagogical intervention. Furthermore, the correlation between strands of metadiscourse and the disciplinary nature of Medicine and Geography has also been vindicated. While holding Medicine as an acceptable model, this research has attempted to link the results to linguistic and professional practices in the Sudanese academic context. Admittedly, like many features in the study, the analysis was inadequate on account of the colossal size of the data, and so it is suggested that future research should pursue some of the issues raised here. For, example, the findings can be compared to analyses of metadiscourse within other genres such as whole or selected chapters within Master or Ph.D. theses. Also, a thorough comparison of the way in which Sudanese scholars realize metadiscourse can be tackled in relation to international standards within any of the knowledge domains. Finally, researchers can undertake an in-depth study of one of the ten features within any of these genres. Indeed, in view of the dearth of research on academic discourse in Sudan, any aspect such as hedging, citation practices or evaluation markers would furnish a promising research niche.

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