

Linguistic Realisations of Rhetorical Structure in Research Articles Abstracts: An Analysis Based on Food Technology Journals

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ABSTRACT

According to the ANSI (American National Standards Institute) guidelines, abstracts of research articles should be written in an objective mode. The abstracts should provide the main points of a study as briefly, concisely and objectively as possible. However, several studies found there to be disciplinary variations in rhetorical structure and in linguistic features. Hyland (2005b) also found that RA abstracts were likely an interaction between authors and their readers. Therefore, novice authors should see to it that their abstracts are crafted with the awareness of rhetorical moves, some linguistic features and the element of interactional metadiscourse to create an effective RA abstract. The present study aims to explore the rhetorical structure and the linguistic features in 100 RA abstracts in the field of food technology. Hyland's five-move model is chosen as an analytical framework to detect rhetorical structure. Hyland (2005b)'s classification of stance and Hyland (2005a)'s taxonomy of interactive metadiscourse markers are employed as the approach in the analysis of linguistic features. The study focused on the choice of tenses, evaluative *that-* structure, stances and transition markers appearing in each move: Introduction, Method, Purpose, Results and Conclusion. The findings suggest that particular linguistic features appear in certain rhetorical moves. The findings could be used for their pedagogical implications for novice authors in the field of food technology, especially in the EFL context.

Keywords: Disciplinary variations, food technology, genre analysis, linguistic features, research article abstracts, rhetorical structure

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INTRODUCTION

Research article (RA) abstracts are the first point of contact with research information for readers seeking research in their field. RA abstracts should be able to help readers

decide if they should read the rest of the article. For these reasons, skillfully written RA abstracts are important for novice authors who wish to enter the discourse community of their discipline, and should be crafted to facilitate such requirements. Swales (1990) proposed and developed the concept of a move, a structural segment that had a specific communicative function and purpose, for analyzing textual structure. To help novice authors to acquire the skill of writing effective RA abstracts, some researchers have explored the rhetorical structure and linguistic features.

Salager-Meyer (1992) found a close relationship between the rhetorical function of each abstract move and the use of verb tenses and modality, while Santos (1996) found that different moves served different genre purposes and thus, required different linguistic resources to realize those purposes, such as thematisation, tense choice and voice choice. Later, Pho (2008) suggested that certain linguistic features such as grammatical subject, verb tense and voice could help distinguish moves in abstracts. Previous studies have pointed to a relationship between the rhetorical moves and linguistic features.

It is widely believed that scientific writing is purely objective, impersonal and informational. This kind of writing is designed to disguise the author and deal directly with facts and independent truth. However, previous research has revealed that RA abstracts are not written in the objective mode. Hyland (2003) explored the use of self-reference and self-citation. Later,

Hyland and Tse (2005) studied the authorial stance and the 'evaluative *that*-structure' in RA abstracts.

Hyland (2005b) also mentioned that effective academic writing was likely interactive between authors and their readers. Authors express their arguments in ways that are acceptable, meaningful and plausible to colleagues. Hyland pointed out that the use of hedges was undertaken to present claims with humility and caution. Gillaerts and Van de Velde (2010) found the use of hedges, boosters and attitude markers in abstracts in *Journal of Pragmatics*, while Khedri, Heng and Ebrahimi (2013) explored interactive metadiscourse markers in abstracts in the disciplines of applied linguistics and economics. They found the frequent use of these interactive metadiscourse markers (IMMs): transition markers, code glosses, endophoric markers and frame markers, respectively. Liu and Huang (2017) explored the use of Chinese authors' interactional metadiscourse in economics research article abstracts. They found that Chinese authors used hedges and boosters to a high degree. Self-mention also increased substantially from 2004 to 2013.

To write effective RA abstracts, novice authors should see to it that their abstracts are crafted with the awareness of rhetorical moves, some linguistic features and the element of interactional metadiscourse. Previous studies have explored RA abstracts from various disciplines and they have found there to be disciplinary variation, but no study has explored RA abstracts from the field of food technology. Thailand aims to

be the leading food producer in Southeast Asia. To respond to the government policy, many universities provide programmes for undergraduate and postgraduate study in food technology. The findings may have some pedagogical implications for novice authors in this field.

The present study aimed to explore the rhetorical structure and some important linguistic features such as verb tense and interactional metadiscourse. The exploration was expected to answer the following questions.

1. What are the features of the move structure of abstracts in terms of move frequency and move pattern?
2. What are the linguistic features of each move in the RA abstracts in the field of food technology?

METHODS

The Construction of the Corpus

According to Nwogu (1991), three criteria should be employed in the selection of the data: representativity, reputation and

accessibility. The impact factors of the journals in the Journal Citation Reports (JCR) presented by the ISI Web of Knowledge 2014 was the basis of representativity and reputation. A corpus of 100 research articles was compiled from three journals in the field of food technology published in the year 2014 via the e-Databases of Mahidol University Library and Knowledge Center. Of the journals selected, 35 articles were chosen from *Food Hydrocolloid (FH)*, 35 from *International Journal of Food Microbiology (IJFM)* and 30 from *Food Chemistry (FC)*, making a total of 100 research articles. These were all empirical research articles with the conventional section format of Introduction-Method-Result-Discussion (IMRD). Conceptual/Theoretical studies were excluded.

Approach to the Analysis of Rhetorical Structure

Maswana and Kanamaru (2015) stated that the genre-based approach is often employed to understand research articles by identifying their organisational structure

Table 1
Description of RA abstracts corpus

	Food Hydrocolloid	International Journal of Food Microbiology	Food Chemistry
No. of RA abstracts	35	35	30
Length of RA abstracts (Range)	117-251	112-345	97-212
Total number of words of RA abstracts	6,577	7,845	4,457

Discipline: Food Technology

Number of RA abstracts: 100 RA abstracts

Year of publication: All articles were published in 2014

Journals: The three journals in the discipline of food technology have high impact factors according to the ISI Web of Knowledge 2014

and key linguistic features. Therefore, the present study applied the existing move models as the analytical framework.

There are three existing models for abstract writing: Bhatia (1993)'s four-move model, Santos (1996)'s five-move model and Hyland (2000)'s five-move model. In deciding which model was most appropriate to employ in the present study, all three models were tested with a typical abstract. It was found that Bhatia's model does not cover the background of the research and it was, therefore, ruled out. Both the Santos model and the

Hyland model were considered viable and acceptable for analyzing research article abstracts in the present study. However, Hyland's five-move model was chosen because Santos' model is derived from 94 abstracts in the field of applied linguistics, while Hyland studied 800 abstracts across eight disciplines: philosophy, sociology, applied linguistics, marketing, electrical engineering, mechanical engineering, physics and biology. Hyland's model was therefore deemed to be more appropriate. This model is illustrated in Table 2.

Table 2
Classification of rhetorical moves in article abstracts (Hyland, 2000, p. 67)

Moves	Functions
Introduction	Establishes context of the paper and motives of the research or discussion
Purpose	Indicates purpose, thesis or hypothesis, outlines the intention behind the paper
Method	Provides information on design, procedures, assumption, approach, data, etc.
Product	States main findings or results, the argument, or what was accomplished
Conclusion	Interprets or extends results beyond scope of paper, draws inferences, points to applications or wider implications

The unit of coding for research article abstracts is a sentence. Each sentence is given a move label. Sometimes, the condensed nature of abstracts causes the possibility of one sentence containing two (dual) moves. Thus, if dual moves occur in one sentence, the sentence would be labelled as containing two or more moves. To determine whether a move is optional or conventional, the frequency of a particular move is recorded. According to Kanoksilapatham (2005), conventional moves occurred from 60% and higher. If

the frequency of a move falls below 60%, the move is considered an optional move.

Like Crookes (1986); Kanoksilapatham (2003) pointed out that lacking explicit rules for decisions on move boundaries reflected the subjectivity of the judgement. To avoid such subjectivity, inter-rater checking was conducted. Following these two studies, one quarter or 25% of the research article abstracts were given to a coder to conduct the individual move identification. The coder was a native English speaking university lecturer. Then the two sets of coding done by

the researcher and the coder were compared. Percentage agreement is a common way to determine the index of inter-coder reliability (Kanoksilpatham, 2003) as it is simple to interpret and to understand. There is also the possibility that discrepancy may occur. It is necessary to resolve any discrepancies through further discussion and analysis, and then re-code problematic texts. If the two coders could not reach an agreement in the re-code problematic text stage, a third coder will be invited to solve the problematic text. The third coder in this case was also a native English speaking university lecturer.

Approach to the Analysis of Linguistic Features

Previous researchers found some particular linguistic features were prominent in particular moves in abstracts. The present study focusses on the following linguistic features.

The Choice of Tenses. Salager-Meyer (1992) stated that the different tenses were related to communicative function of the different rhetorical divisions of abstracts. The ‘history’ type of discourse (purpose, method and results) is related to the past tense. The present is preferred in the ‘comment’ type of discourse: conclusion, recommendation and statement of the problem. The present perfect is used to show authors’ disagreement and a gap in knowledge. These findings illustrate that it is misleading to teach verb tense choice according to time lines only because the

time-sense relationship governs tense selection in writing abstracts. Referring to the findings, the present study explored the choice of tenses in each abstract move. The analysis procedures were as follows. First, if a move was represented by a sentence, the verb tense of that sentence was the verb tense of the move. Second, if a move was represented by several sentences that had both present tense and past tense, both tenses were included. Third, if a move was composed of several sentences that had a single tense, the verb tense of those sentences was the verb tense of the move.

Evaluative *that*- Structure. According to Hyland and Tse (2005), ‘evaluative *that*-structure’ was a grammatical pattern in which a ‘*that*’ complement clause was contained in a higher super-ordinate clause to complete its construction. This structure allows authors to operate powerfully to highlight and promote the importance of the study. The authors pick the choice of reporting verbs to indicate the strength of claim from strong (e.g. prove) to weak (e.g. suggest). Hyland and Tse found that this structure was widely employed in RA abstracts from six disciplines and referred to the structure as ‘evaluative *that*’:

matrix clause [evaluation] + *that*-clause
[evaluated entity]

The present study explored the use of ‘evaluative *that*- structure’ in each move to find out how the authors used the structure.

The analysis procedures were as follows. First, if a move in an abstract contained one evaluative *that-* structure, it would be counted as one author using the structure. Second, if a move in an abstract contained several instances of the use of the evaluative *that-* structure, it would also be counted as one author using the structure. The number of authors using the structure in each move was the focus, not the number of uses of the evaluative *that-* structure. The choice of reporting verbs is discussed below.

Stances and Transition Markers.

According to Hyland (2005b), stance can be seen as “an attitudinal dimension and includes features which refer to the ways authors present themselves and convey their judgements, opinions, and commitments. It is the way that authors intrude to stamp their personal authority onto their arguments or step back and disguise their involvement” (p. 176). The present study retained Hyland’s (2005b) classification of stance. He distinguished four different types of stance: attitude markers, boosters, hedges and self-mentions. First, “attitude markers indicate

the authors’ affective, rather than epistemic, attitude to propositions, conveying surprise, agreement, importance, frustration, and so on, rather than commitment” (p. 180). Second, boosters “allow authors to express their certainty in what they say and to make involvement with the topic and solidarity with their audience” (p. 179). In other words, boosters are used to strengthen a claim, or to close off alternative voices. Third, hedges “indicate the author’s decision to withhold complete commitment to a proposition, allowing to be presented as an opinion rather than accredited fact” (p. 179). Finally, “self-mention refers to the use of first-person pronouns and possessive adjectives to present propositional, affective and interpersonal information” (p. 181). Self-mentions are places where authors put themselves explicitly on stage. The classification of stance is shown in Figure 1.

Apart from stance, interactive metadiscourse markers were deployed when authors of the sample abstracts wrote the RA abstracts. Based on Hyland (2005a)’s taxonomy of interactive metadiscourse markers, there were five IMMs: transition

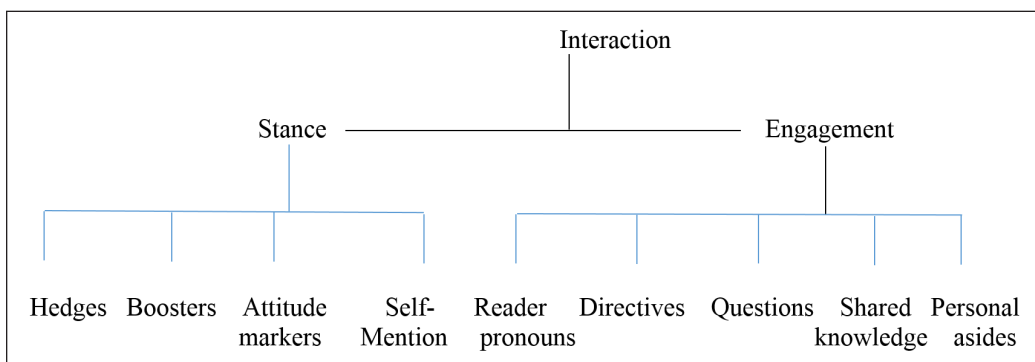


Figure 1. Key resources of academic interaction (Hyland, 2005b, p. 177)

markers, endophoric markers, frame markers, evidentials and code glosses. Khedri, Heng and Ebrahimi (2013) found that transition markers acted as the leading category in the RA abstracts in the disciplines of applied linguistics and economics. Transition markers aid readers in making pragmatic connections between stages in discourse development. Transition markers function to project additive, consequential or contrastive connections between ideas such as *and, furthermore, equally, in the same way, thus, therefore, however* and *in contrast*.

For exploring the elements of stance and transition markers, all the abstracts were scrutinised in full word by word. In this way, all of the elements of stance and transition markers that appeared in each move were collected.

Limitation of the Study

The present study focussed on exploring the four elements of stance in each move in RA abstracts. Engagement and features of reader positioning were not explored because of the shortened form of RA abstracts. Gillaerts and Van de Velde (2010) have indeed stated

that engagement markers were virtually absent in RA abstracts.

To explore the use of interactive metadiscourse markers in the abstracts corpus, a pilot study was done that found that transition markers occurred more frequently than other categories of IMMs. Thus, the present study chose to report only the use of transition markers.

RESULTS

Move Patterns in Food Technology

The most frequent preference patterns among the authors in the field of Food Technology were M-Pr-C (28%), I-M-Pr-C (18%), I-P-M-Pr-C (13%), P-M-Pr-C (12%), M-Pr (9%), I-Pr-C (5%), I-P-Pr-C (4%) and others (11%). These findings were quite different from those reported by Santos (1996) and Pho (2008), who previously found that the P-M-Pr pattern was most prominent in their corpora.

Move Frequency

The frequency of occurrences of each specific move in the field of Food Technology is illustrated in Table 3.

Table 3
Occurrence of moves in the discipline of food technology

Journals	Food Hydrocolloid (N=35)	International Journal of Food Microbiology (N=35)	Food Chemistry (N=30)	Total Move Occurrences (N=100)
Introduction	11	26	9	46%
Purpose	10	16	9	35%
Method	31	29	29	89%
Product	34	34	30	98%
Conclusion	29	30	25	84%

The analysis of the frequency of moves was used to determine whether the moves were conventional or optional. Most of the abstracts in the corpus had three to four moves. Based on the frequency of occurrences, Method (89%), Product (98%) and Conclusion (84%) were found to be conventional moves.

Linguistic Features of Abstract Moves

Three main linguistic features, choice of tenses, evaluative *that-* structure and stances and transition markers are illustrated in each move section below, respectively.

Introduction Move

Choice of Tenses. In the present corpus, the occurrence of the Introduction Move was 46%. The use of choice of tenses is shown in Table 4.

A manual exploration of the choice of tenses showed that the present tense was used most frequently to establish research background. Examples of the use of choice of tenses are shown below.

Example 1

Streptococcus thermophilus *is* a lactic acid bacterium . . . (IJFM 1)

Example 2

A commercial dietary fiber *was* mechanically modified by treating (FH 3)

Example 3

Fusarium verticillioides *is* the most prevalent fungus in kernels and a significant risk of fumonisin contamination *has been exposed*. (IJFM 6)

Table 4
Use of choice of tenses in Introduction Move

Present Tense	Past Tense	Present Perfect	Combination of Tenses
29* (63%)	6 (13%)	2 (4%)	Present + Present Perfect=8 (17%) Present + Past = 1 (2%)

*Number of authors who used tenses

Evaluative *that-* Structure. One author used the evaluative *that-* structure in the Introduction Move.

The findings suggested that the structure was not frequently used by the authors in this discipline.

Table 5
Use of 'evaluative *that-* structure' in Introduction Move

Moves	Evaluative <i>that-</i> Structure
Introduction Moves	1*

* Number of authors who used the 'evaluative *that-* structure'

Example 4

Sensory evaluation of Aspartame in the presence of sodium carboxymethyl cellulose (CMC-L) and sodium alginate (SA) *revealed that* only CMC-L showed (FC29)

Stances and Transition Markers. As mentioned above, some of the authors intruded on the text to stamp their personal authority on the reporting or stepped back and disguised their involvement via the use

of stances. The use of transition markers is a pragmatic strategy to aid readers in making connections between stages in discourse development.

Table 6

Use of each type of stances and transition markers in Introduction Move

Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
19* (41%)	7 (15%)	8 (17%)	- (-%)	6 (13%)

* Number of authors who used stances and transition markers

The findings showed that the attitude markers were the most frequently used in the Introduction Move. The examples of the use of each stance and transition marker are shown below.

Example 5 (Attitude Markers)

Copper (Cu) is an *essential* element and the effects of . . . (FC 22)

Example 6 (Boosters)

Adding high amounts of sugar influences the physical properties of hydrocolloid systems *enormously*, . . . (FH 11)

Example 7 (Hedges)

Fine tuning the concentrations of the biopolymers in the mixture *may* result in dairy matrices . . . (FH 16)

Example 8 (Transition Markers)

However, very little is known about the role of fermented foods . . . (IJFM 10)

Purpose Move

Choice of Tenses. In the present corpus, the occurrence of the Purpose Move was 35%. The use of choice of tenses is shown in Table 7.

Table 7

Use of choice of tenses in Purpose Move

Present Tense	Past Tense	Present Perfect	Combination of Tenses
8* (22%)	26 (74%)	1 (3%)	-

* Number of authors who used tenses

The Purpose Move was the shortest move. Thus, the use of tenses was simple, and the combination of tenses was not found among the abstracts in this study. The most frequent tense used was the past tense.

Example 9

This paper *studies* the impact of the strawberry . . . (FC 1)

Example 10

This work *aimed at* producing cinnamaldehyde . . . (FH 2)

Example 11

The aim of this work *has been to study* the effectiveness . . . (FH 10)

Evaluative *that-* Structure. None of the authors used the evaluative *that-* structure in the Purpose Move (Table 8).

Stances and Transition Markers. Very few authors used stances and transition markers in the Purpose Move (Table 9).

Example 12

In this study, *we* assess the impact of carbon dioxide . . . (FC 21)

Example 13

Here, we combine this type of...(IJFM23)

Method Move

Choice of Tenses. In the present corpus, the occurrence of the Method Move was 89%. The use of choice of tenses is shown in Table 10.

The past tense was the most frequently used tense in the Method Move. None of the authors in the sample had used the present tense to describe the method of their study.

Example 14

Two hundred and thirty-seven samples *were analyzed* . . . (IJFM 23)

Example 15

The tensile strength and elastic modulus of the films *have been improved* by the addition of CW, while elongation *tended to be impaired* by CW loading. (FH 20)

Table 8
Use of 'Evaluative *that-* Structure' in Purpose Move

Moves	Evaluative <i>that-</i> Structure
Purpose Move	-

Table 9
Use of each type of stances and transition markers in the Purpose Move

Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
-	-	-	5* (14%)	1 (3%)

* Number of authors who used stances and transition markers

Table 10
Use of choice of tenses in Method Move

Present Tense	Past Tense	Present Perfect	Combination of Tenses	Others
- (-%)	85* (96%)	1 (1%)	Present Perfect + Past Tense = 1 (1%) Present Tense + Past Tense = 1 (1%)	By + V. ing = 1 (1%)

* Number of authors who used tenses

Example 16

By using an artificial taste receptor model, . . . (FC 29)

Evaluative *that*- Structure

None of authors used the ‘evaluative *that*-structure’ in the Method Move (Table 11).

Stances and Transition Markers. Few authors used stances and transition markers in the Method Move (Table 12).

Example 12 (Hedges)

. . . thermal stability *can be adapted* by the controlled addition of sugar. (FH 11)

Example 13 (Self-Mention)

. . . *we* constructed and characterized deletion mutants . . . (IJFM 1)

Example 14 (Transition Markers)

Additionally, the composition of phenolic . . . (FC 5)

Product Move

Choice of Tenses. In the present corpus, the occurrence of the Product Move was 98%. The choice of tenses used is shown in Table 13.

To report the findings, authors preferred to use the past tense, a combination of present and past tenses and the present tense, respectively.

Example 15

We *found* that PEGS with different molecular . . . (FC 2)

Example 16

. . . films *were* not strong. Nevertheless, it *is* interesting to note a high . . . (FH 1)

Example 17

In this study, we *report* that milk triggers . . . (IJFM 1)

Table 11
Use of the ‘Evaluative *that*- Structure’ in the Method Move

Moves	Evaluative <i>that</i> - Structure
Method Move	-

Table 12
Use of each type of stances and transition markers in Method Move

Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
-	-	1* (%)	5 (6%)	3 (3%)

* Number of authors who used stances and transition markers

Table 13
Choice of tenses in Product Move

Present Tense	Past Tense	Present Perfect	Combination of Tenses
6 (6%)	71 (72%)	-	Present Tense + Past Tense = 21 (21%)

* Number of authors who used tenses

Evaluative *that*- Structure

Ninety-eight authors used the Product Move and 37 of these authors used the ‘evaluative *that*- structure’ to report their findings (Table 14).

Example 18

DSC experiments *show that* more water . . . (FH 3)

Example 19

Correlation analysis *revealed that* the hydroxyl . . . (FC 9)

Example 20

Results *indicated that* E. coli 0157:H7 was able to grow . . . (IJFM 4)

Example 22 (Boosters)

The PH was found to be a key parameter that *greatly* influenced the properties . . . (FH 17)

Example 23 (Hedges)

. . . the pyranose ring *might* have hydrogen bonded with water . . . (FC 30)

Example 24 (Self-Mention)

We found no resistance toward the biocides . . . (IJFM 29)

Example 25 (Transition Markers)

As a result, a radical unique position (C3) in the oleuropein . . . (FC 20)

Stances and Transition Markers

It was found that many authors used stances and transition markers in the Product Move (Table 15).

Example 21 (Attitude Markers)

Therefore, stacking fermentation is an *essential* stage . . . (IJFM 2)

Conclusion Move

Choice of Tenses. In the present corpus, the occurrence of the Conclusion Move was 84%. The use of choice of tenses is shown in Table 16.

To conclude and apply their findings, authors preferred to use the present tense, past tense and a combination of present and past tenses, respectively.

Table 14
The use of the ‘Evaluative *that*- Structure’ in the Product Move

Moves	Evaluative <i>that</i> - Structure
Product Move	37* (38%)

* Number of authors who used the ‘evaluative *that*- structure’

Table 15
The use of each type of stances and transition markers in Product Move

Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
8* (8%)	27 (28%)	21 (21%)	10 (10%)	40 (41%)

* Number of authors who used stances and transition markers

Table 16
Use of choice of tenses in Conclusion Move

Present Tense	Past Tense	Future	Combination of Tenses
39 (46%)	26 (31%)	1 (2%)	Present Tense + Past Tense = 16 (19%) Past Tense + Future Tense = 2 (2%)

* Number of authors who used tenses

Example 26

The study *provides* some insight into the potential microbial . . . (IJFM 27)

Example 27

These findings *demonstrated* that CSPI could be a used as . . . (FH 31)

Example 28

These results *suggest* that the attach of . . . normal rice starch preferentially *occurred* in the amylopectin . . . (FH 14)

Example 29

Particle size, . . . *showed* good correlation . . . Several factors, . . . *will* also affect the heat . . . (FH 34)

Example 30

The regular consumption of these algae . . . around Azores Islands *will improve*

human . . . and *will have* a protective effect . . . (FC 14)

Evaluative *that*- Structure

Eighty-four authors used the Conclusion Move and 33 of these authors used the ‘evaluative *that*- structure’ to report the application of findings (Table 17).

Example 31

This research *suggested that* the absorption of dietary . . . (FC 22)

Example 32

We therefore *hypothesize that* MfsA could be a tress . . . (IJFM 25)

Stances and Transition Markers. Many authors used stances and transition markers in the Conclusion Move (Table 18).

Table 17
The use of the ‘evaluative *that*- structure’ in the Conclusion Move

Moves	Evaluative <i>that</i> - Structure
Conclusion Move	33* (39%)

* Number of authors who used the ‘evaluative *that*- structure’

Table 18
The use of each type of stances and transition markers in Conclusion move

Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
36* (43%)	11 (13%)	42 (50%)	5 (6%)	16 (19%)

* Number of authors who used stances and transition markers

Example 33 (Attitude Markers)

... water quality appear most *crucial* to improve ... (IJFM 32)

Example 34 (Boosters)

... dietary copper could vary *markedly* dependent on the types ... (FC 22)

Example 35 (Hedges)

... branch fraction are *likely to* contribute to the slow digestion of starch. (FC 4)

Example 36 (Self- Mention)

Our findings underline that selection of suitable strain ... (IJFM 7)

Example 37 (Transition Markers)

Thus, the oil body aggregation behavior ... (FC 13)

were conventional: Method Move, Product Move and Conclusion Move, while the Introduction and Purpose Moves were optional moves. However, Suntara and Usaha (2016) found that all five moves in the field of agriculture were conventional. According to Becher and Trowler (2001), Food Technology and Agriculture are under the same domain: a hard-applied domain. The finding suggested that disciplinary variations do exist (Table 19).

It is noticeable from the research that there is a relationship between tenses and the communicative function of the different rhetorical divisions of abstracts. In the Introduction Move, the present tense was prominent. The past was prominent in the Purpose Move, Method Move and Product Move. In the Conclusion Move, the use of the present tense was slightly higher than the use of the past tense. Some authors combine two tenses in one move.

The findings showed that history-type discourse (purpose, method and result) was presented by the past tense. The past tense

DISCUSSION AND CONCLUSION

In the present corpus, the prominent move pattern was M-Pr-C. In addition, the analysis of frequency of occurrences of each move illustrated that three moves

Table 19
Summary of choice of tenses used in RA abstracts

Moves	Present Tense	Past Tense	Present Perfect	Future	Combination of Tenses
Introduction	29*	6	2	-	Present + Present Perfect (8) Present + Past (1)
Purpose	8	26	1	-	-
Method	-	85	1	-	Present Perfect + Past Tense (1) Present Tense + Past Tense (1)
Product	6	71	-	-	Present Tense + Past Tense (21)
Conclusion	39	26	-	1	Present Tense + Past Tense (16) Past Tense + Future Tense (2)

* Number of authors who used tenses

was used to report previous research and retell the what, why, how and the results of the new investigation. In addition, comment-type discourse (statement of problem, conclusion and recommendation) is conveyed by the present tense. The present tense was used to signal the comment, established knowledge and generalizations. The present perfect is also used to introduce a topic and to imply the authors' disagreement with previous research findings.

For the voice of the verb, it was found that the use of the passive voice was more prevalent especially in the Method and Product Moves. It was obvious that the authors focused on the person or object that experienced the action rather than the person or object that performed the action. The findings on tenses and voice may be used as pedagogical tools for novice authors in the EFL context.

Table 20 summarizes how the authors used the 'evaluative *that*-structure' in each move.

It is clear that the authors used the structure in the Product and Conclusion Moves, for it was an opportunity to highlight and promote their findings. The structure also helped in attracting the readers to focus on the application of the findings in the Conclusion Move. The choice of strong and weak reporting verbs was varied depending on the authors' intention and the nature of the study. It was also noticeable that no author used the structure in the Purpose and Method Moves. This can be used to demonstrate to novice authors in the EFL context the relationship of moves and the use of the 'evaluative *that*-structure'. Table 21 shows the reporting verbs used in the present corpus.

Table 20
Summary of use of 'Evaluative *that*-structure' in RA abstracts

Moves	Evaluative <i>that</i> - Structure
Introduction	1*
Purpose	-
Method	-
Product	37
Conclusion	33

* Number of authors who used the 'evaluative *that*-structure'

Table 21
Collection of reporting verbs in the corpus

strong reporting verbs + that		weak reporting verbs + that	
to confirm	to show	to report	to assume
to establish	to suggest	to observe	to hypothesise
to value	to conclude	to propose	to find
to determine	to document	to imply	to appear
to prove	to demonstrate	to indicate	to reveal

A high frequency of stances and transition markers is also found in the Product and Conclusion Moves as shown in Table 22.

Table 22
Summary of authors who used stances and transition markers in four moves

Moves	Attitude Markers	Boosters	Hedges	Self-Mention	Transition Markers
Introduction	19*	7	8	-	6
Purpose	-	-	-	5	1
Method	-	-	1	5	3
Product	8	27	21	10	40
Conclusion	36	11	42	5	16

*Number of authors who used stances and transition markers

Firstly, the authors in the present corpus used attitude markers most frequently in the Conclusion Move and Introduction Move. This means that the two moves were the space in which the authors could add their affective response towards propositions, argument, agreement and frustration etc. In other words, the authors shared their particular attitudes with the readers in these moves. It could be seen that no author used attitude markers in the Purpose and Method Moves. This makes the tone of Purpose and Method Moves more objective.

Secondly, the authors used boosters in the Product Move and Conclusion Move. They conveyed the certainty in findings they had found here. Similarly, no use of boosters was found in the Purpose and Method Moves. The finding seemed to suggest that there was no interaction between authors and their readers in the Purpose and Method Moves.

Thirdly, the authors used hedges extensively in the Conclusion and Product

Moves. Using hedges allows them to avoid making a complete commitment to a proposition. They left room for making other propositions. As with boosters, the authors rarely used hedges in the Purpose and Method Moves, keeping the tone of the two moves objective.

Fourthly, the authors in the present corpus seldom used self-mention. Several used it in the Product, Conclusion, Method and Purpose Moves. It is noticeable that none used it in the Introduction Move. The findings seemed to suggest that the authors preferred to focus on objects or things rather than on themselves.

Finally, transition markers were used more frequently in the Product and Conclusion Moves. The Product Move was filled with the procedures of scientific enquiry, so the authors used transition markers to guide their readers from stage to stage of the process. Table 23 summarizes the function category of transition markers used by the authors.

Table 23
Summary of transition markers in each move

Moves	Function of Transition Markers	Some Examples from the Corpus
Introduction	contrast, addition	however, besides
Purpose	place	here
Method	place, addition, result	here, additionally, therefore
Product	contrast, addition, result, time	nevertheless, furthermore, as a result, meanwhile,
Conclusion	contrast, addition, result, summary	although, furthermore, therefore, in summary

The findings of the present study may be used for their pedagogical implications in academic writing, especially in the EFL context. Some linguistic features of RA abstracts should be incorporated into academic writing courses for graduate and postgraduate students to prepare them to participate in the research world. This knowledge is essential for them in the course of their study and for dialogue in the academic community. Many handbooks on research paper writing give a very general description of an abstract and provide a sample abstract. In order to provide useful instruction on abstract writing to novice authors, it is necessary to illustrate to readers how to realize the structure linguistically. To reach the goal, such information needs to come from corpus-based research findings and it needs to address the disciplinary variations. The corpus in the present study was of empirical research articles, so the results are most clearly applicable to the empirical research genre. Other types of research article such as theoretical papers may have a different structure and linguistic realizations of rhetorical moves. Thus,

further studies of theoretical papers from various disciplines may yield interesting results and give us a fuller picture of the rhetoric of research article abstracts.

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