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# Analysis of moves, rhetorical patterns and linguistic features in *New Scientist* articles

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## ABSTRACT

This paper investigated the moves, rhetorical patterns based on Swales' genre analysis, and common linguistic features in health and medical science reports in the *New Scientist* journal. Twenty-four articles, one from each weekly issue, were randomly selected from the articles with a length between 350 and 600 words published online in *New Scientist* between July and December 2012. They were analyzed according to the content, categorized and coded with corresponding descriptions. The findings revealed seven obligatory and two optional moves. The key linguistic features common in the articles were modals and voice.

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## Introduction

Reading English scientific articles is one of the greatest challenges for non-native speakers of English, especially those studying at the graduate level. In Thailand, a considerable number of graduate students find reading English-written materials tough. They prefer reading texts in the Thai language though some graduate programs attempt to integrate English into activities such as lectures, project presentation, and reading discussion in the content area classes. This may be due to students' low English proficiency and unfamiliarity with English-written academic discourse such as science research articles which are structurally and lexically complicated. These students need support. Training them to read English research articles may be too advanced. It may be achievable if they start from a friendly version of research articles, but what types of text can these be? The researcher proposes science news reports. First, they cover stories about new experiments or discoveries in science based on research articles. It is, then, interesting to see if there are links between science news

articles and research articles. Second, the intended audience of science news articles is the general public, which implies that the messages conveyed to them are presented in a simpler language than that used by scientists to communicate in their community. Less complicated written articles could be a stepping stone for less English-proficient graduates to learn more about what people in their fields are working on. Unfortunately, not many studies have focused on science news reports. Since stories in the journal are based on scientific research presented in less intimidating format, as may be observed from their length, presumably, they may contain certain common, research-report characteristics, which may promote students' reading competence. This research aimed to fill the gap with an attempt to identify moves, their rhetorical patterns, and the language features frequently found in health and medical science reports in *New Scientist*, one of the most popular journals among different groups of readers.

## Literature Review

Genre analysis is an approach used to study the relationship between a particular type of the text and its

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context by dividing the text into small semantic units called moves. Each move has different communicative purposes that are shared among community members and this is reflected by the language use to serve specific functions. The combination of moves reveals structural patterns of the rhetorical discourse, and their sequence based on the author's communicative goals. Swales (1981, 1990) referred to 'genre' as 'a class of communicative event' in which its communicative purpose is shared by specific discourse community members. To gain insight into the text and its constituents, the way it is composed, interpreted and used, Swales employed genre analysis of the introduction section of each research article. From his study, he proposed the model Create a Research Space (CARS) as shown in Table 1.

Swales' research introduced how a text is structured and it has influenced several researchers to explore texts of different genres to gain insights into the flow of texts, their moves, and patterns. The model has been applied in several studies on parts of scientific journal research reports, for example, abstracts (Kenneth & Maclean, 1997; Tseng, 2011), introductions (Joseph, Lim, & Nor, 2014; Swales, 1981), results and discussion (Amnuai & Wannaruk, 2012; Yang & Allison, 2003); and full scientific journal research reports (Kanoksilaphatham, 2005; Nwogu, 1997; Tseng, 2011). These studies have provided guidelines for those new to their target community and its common practices as seen in *Academic Writing for Graduate Students* by Swales and Feak (1994), which introduces international students from different disciplines to the characteristics of academic writing and to self-positioning in their field of study. The credibility of Swales' model and its practicality to pedagogy are the main reasons why this study was conducted within this framework.

Among research on several types of texts aforementioned, health and medical news reports have been scarcely explored. Nwogu (1997) and Fryer (2012) analyzed medical research articles. The findings of these studies showed similarities in four moves and taxonomical differences in classifying moves and steps. Nwogu (1991) examined 15 popularized science news articles from *New Scientist*, a popular science magazine, *Newsweek*, a general magazine, and *The Times*, a newspaper. Nine moves were found.

Unlike science research reports which disseminate scientists' works with complex content to their specialized circle, using technical terms and specialized language

(Melles, 2004), the health and medical news report conveys the essence of complex scientific content, but the way it is presented is less technical and more popularized, making it accessible by a wider audience (Schafer, 2011). Such characteristics could be beneficial for non-native English speakers, especially those not proficient in English and new to research.

However, Nwogu (1991) may not reflect the clear patterns of this genre because the number of articles was small and the data sources were from different science magazines and journals. Moreover, there was no account on the text length or distinct criteria for move categorization. These factors could obscure the findings. The current study, on the other hand, examines 24 health and medical news reports from one specific medium, *New Scientist* issues between January and July 2012, following Swales' model, to gain insight into moves of English texts, their patterns, and linguistic features in the hope that the findings could empower learners by preparing them linguistically and academically before being exposed to the real world of international expertise. This makes the health and medical news report a worthy subject for investigation. The research questions are:

1. What are the moves and their rhetorical patterns of health and medical news reports in *New Scientist*?
2. What are the linguistic features commonly found in *New Scientist* articles?

## Method

### Materials and Data Collection

*New Scientist* is a magazine and e-zine that publishes articles from different fields of science such as biotechnology, environment, and medicine. It reports recent experiments and discoveries based on full papers published in professional journals. In this study, twenty-four health and medical news articles issued between July and December 2012—one from each weekly issue—were retrieved from [www.newscientist.com](http://www.newscientist.com) and randomly selected on the basis of the text length of between 350 and 600 words.

### Data Analysis

The health and medical news reports were numbered, tabulated and analyzed within Swales' framework of genre analysis (1990). The researcher read each report and divided it into segments which were then marked as moves based on the content and given short descriptive names. The researcher reread the scientific news reports in order to ascertain whether there was any arbitrariness or overlaps among the moves. After revisions, alterations and modifications were made. Then they were classified into two types of moves: obligatory moves and optional ones based on the cut-off frequency of 60 percent occurrence as a measure of move stability (Kanoksilaphatham, 2007). Subsequently, to determine the move structures, the researcher re-examined the moves of each article and recorded their sequence. For reliability, an expert in the field analyzed the articles and coded them separately. In comparison, the agreement rate

**Table 1**  
CARS model for research article introductions by Swales

Move 1 Establishing a territory		
Step 1	Claiming centrality	and/or
Step 2	Making topic generalization(s)	and/or
Step 3	Reviewing items of previous research	
Move 2 Establishing a niche		
Step 1A	Counter-claiming	or
Step 1B	Indicating a gap	or
Step 1C	Question-raising	
Move 3 Occupying the niche		
Step 1A	Outlining purposes	or
Step 1B	Announcing present research	
Step 2	Announcing principal findings	
Step 3	Indicating article structure	

Source: Swales (1990, p. 141)

between the expert and the researcher was 85 percent. They discussed the discrepancies and finally established resolution. In response to Question 2, emergent key linguistic features were analyzed by hand and with AntConc, a free-ware concordance program written by Lawrence Anthony. An agreement between the researcher and the expert in the field was 100 percent.

## Results

### Moves

The investigation of 24 health and medical news reports in *New Scientist* via genre analysis revealed seven obligatory moves which occurred over 60 percent of the corpus and two optional moves as illustrated in Table 2.

#### Obligatory Moves

According to Table 1, seven obligatory moves that constitute this genre are arranged in the order of their occurrence in the reports. They are:

**Move P: Introduce the point of the study** started many of the science news reports. It contained a succinct summary of research, new findings, or recent discoveries from experiments. It might also state how the advance might benefit readers and society, solve existing problems, or become an alternative to current treatment approaches which have some weaknesses. For example

*Treatment for a lethal form of brain cancer could be on the horizon after the discovery that the cancer can be formed by two genes fusing together. People with the disease could potentially benefit from drugs that block the activity of a protein produced by this wayward fusion.* (A1)

**Move B: Give background knowledge of the study** follows the introduction. In this stage, the science reporter built up the readers' basic knowledge by giving a historical overview of a field or of a feature under research. **Move B** prepared readers to become more familiar with current studies after explaining how important and relevant to their well-being the research was. In presenting this move, the majority of the science news reporters assumed the role of a storyteller, narrating features under investigation. For example,

*During a pregnancy, cells from mother and fetus can cross the placenta and survive for decades in the skin, liver and*

**Table 2**  
Rhetorical moves in health and medical science reports

Rhetorical move	Obligatory or Optional
Move At: Attract readers' attention to the study.	Optional
Move P: Introduce the point of the study.	Obligatory
Move B: Give background knowledge of the study.	Obligatory
Move T: Introduce the research team and their study.	Obligatory
Move A/P: State the team's assumption/hypothesis/objective/prediction.	Obligatory
Move M: Present the methodology.	Obligatory
Move F: Present the findings.	Obligatory
Move E: Evaluate the findings.	Obligatory
Move R: Recommend future studies.	Optional

*spleen – a phenomenon called fetal microchimerism. Fetal DNA can also cross the blood–brain barrier and enter the brain of pregnant mice.* (A6)

**Move T: Introduce the research team and their study** revealed the names of the researchers or the research leader and their institutional affiliation. It also included brief and specific information of the work they were engaged in including the subject matter, the method, and the test subjects such as mice or humans. For example

*Geoffrey Ghose and Blaine Schneider, at the University of Minnesota in Minneapolis, investigated timing in the brain by training two rhesus macaques to perform tasks in which they moved their eyes between two dots on a screen at regular 1-second intervals.* (A8)

**Move A/P: State the team's assumption/hypothesis/objective/prediction** was the move which expressed what the research team aimed at exploring after the problems of previous studies or gaps in knowledge had been identified. The move frequently appeared after **Move B**. In **Move A/P**, quotes from interviews with the research leader appeared in many reports. This may have been because assumptions or predictions are a very important part of research that must be meticulously conveyed to readers, and the ones who know the most about these assumptions or predictions are the researchers themselves.

*"We thought it would be incredibly useful if we could mimic jellyfish and functionalize microfluidic devices with long tentacles," says Karp.* (A6)

**Move M: Present the methodology** informed readers of how a study was conducted and what techniques or tools the researchers employed in their experiments. This Move included more information about the research participants/animals/test subjects, conditions required for the study, the treatments given, the techniques used, and/or the steps taken in the experiment. For example

*To investigate this, Nelson and her colleagues autopsied 59 brains of deceased women – 33 of whom had Alzheimer's disease. They amplified the DNA that they found, creating many more copies, and looked for the presence of a male Y chromosome.* (A6)

**Move F: Present the findings** revealed what the researchers found as a result of the experiment or laboratory test, and their interpretation of the findings. For example,

*Five days after exposure, mice with a full set of proteins had lost all their egg cells. Those lacking PUMA, however, retained 15 per cent of their original store of eggs. Mice lacking both PUMA and NOXA appeared especially hardy, retaining more than half of their eggs.* (A15)

**Move E: Evaluate the findings** focused on assessing the research results and the contribution they might make to the research community, weak or strong points of the studies, or whether further research was required to confirm the findings or to approach related questions for a better understanding. **Move E** had two extensions. The first was the research team's opinion about their studies, and the second extension was opinions of experts in the field

who might agree with the research team, make comments on their work, or raise doubts and/or cautions about application of the outcome.

#### Optional Moves

**Move At: Attract readers' attention to the study** occurred in 25 percent of the health and medical news reports, often at the start of the report. Its main purpose was to arouse readers' interest in reading the whole story. It often employed alterations of famous quotes or expressions, analogies, figures of speech, and mixtures of registers. As well, this Move attempted to capture readers' attention by engaging them with a question. For example,

*COULD we stem the tide of ageing by delaying the deterioration of stem cells? (A3) NOT all sperm are created equal. (A5)*

**Move R: Recommend future studies** occurred at the end of one-sixth of the 24 reports, expressing the hope for further research stemming from the current study, new research associated with the current findings, and reasons for new research. For example,

*But further research is needed before the team can progress to clinical trials in humans. (A12)*

To summarize, the major segments of health and medical science news reports lead the audience to the whole story by presenting its main concept, offering background information to prepare them to enter the world of science, study assumptions and then the procedures, methods, or experiments. The next two moves are the research findings and evaluation in order to enable a lay audience to hear a variety of voices themselves—the voices of the news reporters, researchers, and specialists. This possibly enhances the audience's understanding of the reports. Additional to those obligatory moves, the findings also revealed two optional moves. **Move At** aims at catching the audience's attention to some complex study topics. Catchy phrases, quotes, or metaphors are employed to explain research essences. Finally, **Move R** suggests possible future research topics established on the researcher's study, and this move serves as an extension from the primary study.

#### Rhetorical Patterns

After examining how each health science news article was ordered, the researcher drew a diagram showing the succession of moves as seen in Table 3. From more detailed scrutiny, the common order of compulsory moves in the news reports was  $P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow M \rightarrow F \rightarrow E$ , which is similar to the rhetorical pattern of the scientific journal research article. In other words, the health science news reports started with a general statement about the study and provided the audience with background knowledge to facilitate their understanding. Following this basic information, the research team was introduced and research methods were given. The science reporters usually ended their reports with the findings of the study and evaluations by the researchers and others.

What generated variations in move patterns were **Move A/P** and **Move At**. For example, **Move A/P** was situated

**Table 3**  
Rhetorical patterns

Health and medical news report#	Moves
1	$P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow M \rightarrow F \rightarrow E$
2	$At \rightarrow P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow M \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E$
3	$At \rightarrow P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow B \rightarrow F \rightarrow M M \rightarrow F \rightarrow E E E$
4	$P \rightarrow B \rightarrow A/P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E$
5	$At \rightarrow P \rightarrow A/P \rightarrow T \rightarrow M \rightarrow B \rightarrow M \rightarrow F \rightarrow E$
6	$P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow A/P \rightarrow M \rightarrow F \rightarrow E E E \rightarrow R$
7	$P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow B \rightarrow F \rightarrow E E$
8	$At \rightarrow P \rightarrow B \rightarrow A/P \rightarrow F \rightarrow T \rightarrow M \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E$
9	$P \rightarrow B \rightarrow T \rightarrow P \rightarrow A/P \rightarrow B \rightarrow M \rightarrow F \rightarrow E E$
10	$At \rightarrow P \rightarrow T \rightarrow B \rightarrow M \rightarrow A/P \rightarrow F \rightarrow E \rightarrow R$
11	$P \rightarrow B B \rightarrow A/P \rightarrow T \rightarrow M \rightarrow F \rightarrow E E$
12	$P \rightarrow T \rightarrow A/P \rightarrow B \rightarrow M \rightarrow F \rightarrow E \rightarrow R \rightarrow E E$
13	$P \rightarrow T \rightarrow A/P \rightarrow M \rightarrow F \rightarrow E E \rightarrow R$
14	$P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow M \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E \rightarrow R$
15	$P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow M \rightarrow F F F \rightarrow E E$
16	$P \rightarrow B \rightarrow A/P \rightarrow T \rightarrow A/P \rightarrow M \rightarrow E E E$
17	$P \rightarrow B \rightarrow T \rightarrow B B \rightarrow A/P \rightarrow M \rightarrow F \rightarrow A/P \rightarrow F F \rightarrow E$
18	$P \rightarrow B \rightarrow T \rightarrow M \rightarrow F \rightarrow E E E E$
19	$At \rightarrow P \rightarrow B \rightarrow T \rightarrow M \rightarrow F \rightarrow E E E$
20	$T \rightarrow P \rightarrow B \rightarrow A/P \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E E$
21	$P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow M M \rightarrow F \rightarrow E \rightarrow F \rightarrow E E$
22	$P \rightarrow T \rightarrow M \rightarrow F \rightarrow B \rightarrow A/P \rightarrow M \rightarrow F \rightarrow E E$
23	$P \rightarrow B B \rightarrow A/P \rightarrow T \rightarrow M \rightarrow F \rightarrow FS \rightarrow E E E$
24	$P \rightarrow B B \rightarrow A/P \rightarrow B \rightarrow A/P \rightarrow M \rightarrow F \rightarrow T \rightarrow M \rightarrow F \rightarrow E E E$

between **Move B** and **Move T** as seen in the pattern of the health science news article numbers 1, 3, 4, 6, 8, 11, 14, 16, 23, and 24, and also between **Move T** and **Move M** as seen in 2, 9, 15, 17, and 21. Another example is **Move At**, which was used to attract readers' attention at the start of the article as illustrated by the science news article number 2  $At \rightarrow P \rightarrow B \rightarrow T \rightarrow A/P \rightarrow M \rightarrow F \rightarrow M \rightarrow F \rightarrow E E E$ , and number 19  $At \rightarrow P \rightarrow B \rightarrow T \rightarrow M \rightarrow F \rightarrow E E E$ . Another pattern occurred in the reports having **Move R: Recommending further studies** at the end as seen in article numbers 6, 9, and 14. **Move R** also occurred before **Move E** as in the report numbers 12 and 23. In some variations, however, some science reports were composed in the way that some Moves recurred as in the science report numbers 2, 3 and 5.

#### Linguistic features

In addition to moves and move order patterns, the study also revealed key linguistic features of the health and medical science reports: voice and modals. The active voice focuses on the agent of the action while the passive voice focuses on the process rather than the initiator of the action. Modals, such as 'will', 'would', 'can', 'could', 'may' and 'might', on the other hand, can have two different meanings: intrinsic meanings, which relate to permission, obligation, or volition, and extrinsic meanings, which relate to possibility, necessity and prediction (Biber, Johansson, Leech, Conrad, & Finegan, 1999).

#### Active and Passive Voices

The findings showed that in all of the health and medical news reports, active voice constructions considerably outnumbered passive ones. The passive voice was infrequently

used and there was no significant evidence concerning which specific move of the passive voice was prevalent in any move. This suggests that in health and medical news reports, it is important that agents and their actions be made clear. Table 4 below shows the frequency of active and passive voice constructions in each health and medical news report.

The active verb was prominent in all the Moves found in this study, even in the research methods, the part which is generally described in the passive form in science research articles to underscore the process, not the agent. The usage allows the reporter to inform audience of what happens or what causes something to happen in each step of an experiment, not how each step has been performed. For example,

*In theory, the tiny structures could deliver therapeutic drugs to a brain tumor, but navigating the narrow, syrupy spaces between brain cells is difficult. (A12)*

In addition, the active form is a device that introduces the audience to the responsible team of the study and their affiliated institute. It helps the audience relate more easily to those involved in the study and their actions. The straightforward revelation of the researchers' names and their work in the health science news reports plays an important role in empowering the audience to justify whether the research is of any value and credibility for them.

*Geoffrey Ghose and Blaine Schneider, at the University of Minnesota in Minneapolis, investigated timing in the brain by training two rhesus macaques to perform tasks in which they moved their eyes between two dots on a screen at regular 1-second intervals. (A8)*

Evidently, the active voice may simplify the complicated content for the public by reducing ambiguity and distance between readers, researchers, and their stories, unlike the medical English used in health science research which is complex both structurally and lexically (Melles, 2004).

Why the active voice is prominent in health and medical news reports is worth considering. The purpose of the reports was to disseminate scientific information to the general public. Thus, it was essential to make complex scientific issues with intricate investigative techniques accessible to a wider circle of readers beyond the science community. One way to achieve this goal is to simplify the scientific discourse; 'An agent performs an action or shows a state' potentially works better than 'A recipient receives an action'.

**Table 4**  
Frequency of active and passive voice constructions

Text#	Active	Passive	Text#	Active	Passive	Text#	Active	Passive
1	31	4	9	26	9	17	38	7
2	40	4	10	37	2	18	51	13
3	52	2	11	48	3	19	54	5
4	40	5	12	33	2	20	25	1
5	25	5	13	44	3	21	47	8
6	45	1	14	52	9	22	40	6
7	27	5	15	47	2	23	48	7
8	33	4	16	28	7	24	49	7

Unlike the active voice, the passive voice is generally used to focus on the action rather than its initiator. In health and medical news reports, the passive form can be categorized into the agentless passive with 85 occurrences (92.4%) and the agent passive with seven occurrences (7.6%). Apparently, the agentless passive is used for generalizations, not involving any specific individuals or study teams. For example,

*Stress is associated with changes in the amount of neuromodulators such as adrenalin present in the brain. (A8)*

*In the prevailing model, different types of neurons are generated in successive waves by a single type of stem cell. (A9)*

It should be noted that in some of the passive sentences, the initiator of the action was present, which makes it equivalent to an active voice construction. The information in the passive sentence is equivalent to that in the active one since the two differ only in word order. In the passive sentences, the expressed agents were long and often located at the clause final position to introduce new and important information.

#### Modals

Modals used in the health and medical science reports are 'can,' 'could,' 'may,' 'might,' 'would,' 'will,' 'should' and 'must.' Table 5 shows the frequency of these modals. 'Can' and 'could' were the most common in the science news reports, followed by 'may' which was used approximately half as frequently, and 'might,' used approximately a third as often as 'can' and 'could'. 'Will' and 'would' were less frequent, while 'should' and 'must' were very rarely found in the reports.

In terms of meaning, some modals such as 'can' conveyed more than one meaning and some such as 'could,' 'might,' and 'would' had overlapping meanings. Further data analysis revealed that these modals appeared in specific moves. Table 6 below shows the frequency of each modal and its presence in each move.

**Table 5**  
Frequency of modals

Modal	No. of Occurrences	Modal	No. of Occurrences
can	56	would	16
could	49	will	14
may	24	should	3
might	18	must	2

**Table 6**  
Modals and their frequency in moves

	can	could	may	might	will	would	must	should
P	9	15	5	4	2	0	0	0
B	17	0	0	1	0	2	0	0
A/P	6	6	2	2	2	5	1	0
M	1	1	0	1	0	0	0	0
F	5	4	3	0	0	2	0	0
E	17	22	15	10	10	7	2	3
R	1	1	0	0	0	0	0	0

**'Can' and 'Could'.** Table 6 shows that 'can' and 'could' were frequently used in the health and medical news reports. The modals occurred in **Move P**, **Move A/P**, **Move F**, and **Move E**. Also, they were used once in **Move M** and in **Move R**. 'Could' appeared more frequently than 'can' in **Move P** and **Move E**, whereas 'can' had a distinctive place in **Move B**, but 'could' was not present in this Move. A possible explanation for this is that the body of knowledge is considerably well-established, and the degree of certainty in the research result well-supported by substantial evidence is quite high.

A closer look at the meanings of 'can' and 'could' reveals that 'can' was principally used to mark 'ability' and 'possibility' while 'could' mainly marked 'possibility', 'hypothetical situations' and 'past time ability', respectively. The following are examples of the uses of these modals.

*Cancer treatments that involve radiation can also wipe out egg cells by damaging their DNA, which causes them to self-destruct. (A15)—ability.*

*Stem cell therapies require a huge numbers of cells though, and it can be difficult to obtain a sufficient amount from a living donor. (A25)—possibility.*

**'May' and 'Might'.** Like 'can' and 'could', the modals 'may' and 'might' also express 'possibility'. The findings show that they occurred in **Move P** and **Move E**. 'May' occurred almost as frequently as 'can' in **Move E**. Both 'can' and 'may' are slightly different from 'could' and 'might' in that the latter have greater tentativeness than the former. In other words, events or situations with 'can' and 'may' are more likely to happen than those with 'could' and 'might'. For example,

*The discovery may pave the way for new treatments for autism and schizophrenia. (A9)*

*Gianluca D'Ippolito and his colleagues at the University of Miami, Florida, wondered whether they might survive longer than the others. (A23)*

**'Will' and 'Would'.** According to the findings, 'will' and 'would' also appeared in **Move E** but not as frequently as 'can', 'could', 'may' and 'might'. While 'will' expressed future activities, 'would' carried the meaning of 'possibility'. For example,

*Meyre put these facts together and came up with the hypothesis that the variant gene would increase the risk of depression. (A21)*

'Would', like 'could', was often found in **Move A/P**. Both were used to assert the research team's 'expectation' for their work—the possibility or likelihood that the research findings would meet the study's goal or teams' expectations. 'Could' and 'would' convey modesty on the part of the researchers, as opposed to 'can' or 'will' are more assertive in tone. For example,

*Stem cell therapies require a huge numbers of cells though, and it can be difficult to obtain a sufficient amount from a living donor. Could cadavers be the answer? (A25)*

## Discussion

The study on 24 health and medical science news reports revealed some characteristics similar to previous research findings. Like Nwogu (1991), the major components that constituted this genre typically consisted of **Move P**, **Move B**, **Move M**, and **Move F**. This was also in line with medical English research reports found in Nwogu (1997) and Fryer (2012) and those of other disciplines (Kanoksilapatham, 2005, 2007).

Other than those Moves, there were taxonomical differences in categorizing moves and steps. In this study, the obligatory **Move E**, in which the researchers themselves, and/or experts of the field, commented on study methods or outcomes, showing their approval, hesitation, rejection or suggestions, was a step in Nwogu (1991), and so was the optional **Move R**. Another difference between the current research and Nwogu (1991) fell on the optional **Move At** located at the start of the health and medical news reports in this study. **Move At** was not present in Nwogu (1991) but it was a separate Move in the current study as it has an explicit function of triggering readers' interest in continuing reading the entire report. A possible explanation of an absence of this Move in Nwogu (1991) might be due to differences in the number and length of the news reports in the two studies or due to possible rhetorical changes in this type of genre almost over the past three decades.

In terms of linguistic features, active and passive voice and modals were observed. The frequent use of the active voice found in this study mostly complied with previous research (Fryer, 2012). According to the current study of health science news reports, the active verb outnumbered the passive one in all moves. In Fryer (2012), the occurrence of the former could be observed predominantly in every move of English medical research articles, except in the move of Methods, where the agentless passive form outweighed the active one. The difference may be because both types of articles had different target audiences. The rhetorical patterns of the two studies belonged to different genres, and they were designed for different purposes. The news reports in the current study aimed at disseminating information from science research reports to the public from a less technical angle. Therefore, clarity and simplicity of messages are necessary for this audience. On the contrary, medical research reports are published for scientists who have adequate background of the study. Therefore, in the Methods, their focus was on the procedure, and passive verbs were required. On the other hand, Nwogu (1997) reported the use of passive verbs in what that study described as Move 4: Describing Data-Collection Procedure, Move 5: Describing Experimental Procedures, Move 6: Describing Data-Analysis Procedures, and Move 7: Indicating Consistent Observation. However, it was not clearly reported whether the passive voice was predominant in those Moves.

Regarding modals, the current findings were generally in agreement with those in previous studies (Fryer, 2012; Joseph et al., 2014), where 'may' in this research frequently occurred to denote 'possibility' in the moves aiming at stimulating needs to investigate the gap in

literature, and at discussing and evaluating study outcomes. Similar to Joseph et al. (2014), 'might', 'can', 'could' and 'would' in the current study also were found in these moves, while 'may' and 'will' were employed to make predictions about further research.

Despite the similarities in the use of modals aforementioned, there was a difference as well. In Fryer (2012), 'must' and 'should' appeared in the move of conclusion, signifying necessity and obligation. In this research, however, the modals emerged in the same sense but in the move of evaluating the study outcomes, instead. Interestingly, it may be inferred that the medical research reports in Fryer (2012) might underscore future studies and their directions based on the findings from the original research whereas the health and medical science news reports in the current study assigned more weight to the original research being reported.

## Conclusion and Recommendation

The health and medical news reports structurally resembled research articles in terms of the major moves and of the important linguistic elements commonly found, being the voice and modals. This could offer a new perspective in introducing these elements into the English language classroom as worthy of consideration in medical and health news reports.

Learning a foreign language is a challenge for learners due to many linguistic factors such as differences from their mother language, non-linguistic factors such as learners' needs and interests, as well as instructional materials. The findings from this study suggest that science news reports from *New Scientist* can be applied as a source of instructional material because the content corresponds with science learners' interests and is written with less demanding linguistic requirements (Melles, 2004). Learners could feel less anxious and become more confident in interacting with texts of their achievable level of English complexity. The materials can act as a bridge for novices to enter the circle of the experts in their study area so they also learn more about new research and discoveries, which, in turn, can inspire them to their own research in the future. In addition, the English language in those reports is authentic, that is, it is written for an English-speaking audience, and used in the real world of communication, research, and media. Consequently, science news reports should be used in the instructional material for second or foreign language learners.

Based on the findings of this study on health and medical science news reports published in *New Scientist*, through the lens of genre analysis, the researcher proposes three significant pedagogical implications.

First, the findings revealed the presence of rhetorical patterns of articles in *New Scientist* as seen from the recurrences of moves. This implies that learners can use the patterns as a scaffold to decode and anticipate messages conveyed by the author, and aggregate the content from different chunks of information, thereby accelerating their reading speed and enhancing comprehension. In other words, being aware of moves

and their boundaries when interacting with a foreign language text, learners would be able to analyze which part of the text provides its readers with background knowledge of the topic, which reveals research methodology and which is the findings, for example, and then synthesize the information for comprehension. *New Scientist* should be introduced to learners so that they get acquainted with the genre of science news reports, rhetorical moves, and their patterns. If this can be implemented successfully, learners may become more aware of the interact with texts that not only improves their reading in a foreign language but also augments knowledge of their content area. With experience and good skills, there is a likelihood that they may apply discourse analysis to other genres for further developing their reading competence.

Second, this study also revealed the prominent features in health science news reports, of active and passive voices and modals. Learners learn from concrete evidence when the active voice or the passive voice is used, how it is structured, with or without an agent, and what purposes it serves. Such a language lesson likely engages learners to make senses of the text and become aware of the fluidity of the language, that is, the possibilities of how a message is conveyed. For example, an active agent is used to put the person who is conducting the research or experiments in the spotlight, rather than being hidden or remaining ambiguous while a passive agent is used to focus on the process rather than the doer of the action that has already been referred to, thus making it unnecessary.

Another commonly found linguistic feature is modals. The findings in this study showed rich use of modals such as 'can', 'could', 'may', and 'might' that associate their locations with meanings in particular moves. For instance, 'could' occurred mostly in **Move P**, and **Move E**. 'Could' in **Move P** carried the meaning of 'possibility' of an expected outcome of research. It was also used to report the researcher's or an expert's position regarding the research finding being a study outcome that was a possible answer to the research question. Learning the features, which are normally dry, difficult, and tiring due to the irrelevance of the context, can be made more meaningful and understandable when they are located in a context related to the learners' fields of study.

This is an opportunity in which learners of English as a foreign language can learn the language at the same time as the basic components of research in brief, in preparation for their full participation in their science community in the future.

## Conflict of Interest

There is no conflict of interest.

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