Using linguistic-informed analysis to assess model texts for teaching EFL reading

Monaliza Hernandez Mamac[1*] and Lungguh Ariang Bangga[2,3]

[1]*Faculty of Education, Prince of Songkhla University, 181 Chareon Pradit Road, Rusamilae, Mueang Pattani*
[2] *Department of Linguistics, Faculty of Arts and Social Sciences, The University of Sydney, John Woolley Building, A20, Sydney, NSW 2006, Australia*
[3]*English Literature Department, Faculty of Literature, Culture, and Communication Studies, Universitas Ahmad Dahlan, Yogyakarta, Indonesia*

ABSTRACT

English as Foreign Language (EFL) textbooks contain texts with topics integrated from content areas, such as science. In Thai basic education, learning in content areas is typically done in Thai. Therefore, EFL reading texts provide learners with primary exposure to building content knowledge in English. This raises an issue about how the language of these EFL texts is organised, and if they can help the learners' transition to university where they are required to read content area texts in English. The paper provides an in-depth demonstration of how linguistic analysis can inform the choice of model texts for teaching EFL reading. It deploys a qualitative linguistic analysis method drawing on Systemic Functional Linguistics. The data are the scientific descriptive report texts in EFL textbooks used in a Southern Thailand secondary school. They are compiled in a small corpus, and one text is selected purposively to demonstrate how linguistic analysis can be used to assess the text. The text is analysed using a 'top-down' approach, from genre stratum down to the lexicogrammar, with the purpose of examining the text's ideational, interpersonal, and textual resources to build up scientific knowledge. The findings show that the text does not conform to scientific descriptive reports' discursive and linguistic features due to its extra stages, incomplete scientific taxonomies, relatively low technicality, low social distance and authority, and incoherent thematic flow. Hence, the quality of the text as a model becomes problematic. Learners learning from these teaching materials may experience challenges when they read authentic science texts at the university level. The paper offers a viable alternative methodological resource for educators to use a systematic, critical and linguistically-grounded evaluation in EFL reading classes.

Keywords: English language teaching; EFL reading, linguistic analysis; Systemic Functional Linguistics

INTRODUCTION

English as a Foreign Language (hereafter EFL) textbook analysis has been a significant research agenda around the globe. This area has gained attention among EFL scholars for the past two decades, as works on evaluating EFL textbooks can be a promising path to boost students' success in learning. Though EFL textbooks are crucial to facilitate learning, they cannot be seen as a single reliable source for the success of English learning. In fact, EFL textbooks pose a significant issue that hinders students from successfully learning and developing their competence in English (Tomlinson, 2008). This issue predominantly relates to the

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* Corresponding Author
Email: missmonaliza.h@psu.ac.th

explicit delivery of grammar or other knowledge of the language, which seems to be decontextualized from how it is used for getting things done in social contexts. Hence, rather than providing students with relevant knowledge of the language and the metalanguages required to participate in accomplishing tasks in society, the materials fail to orient students towards the knowledge of how language is used for achieving social goals.

Current research on language teaching materials evaluation and development has been well-documented, cutting across various methodologies, historical perspectives, controversial issues, and countries or regions (Norton & Buchanan, 2022). This area has been considered crucial for the advancement of the field and for providing a better outcome concerning the development of language teaching materials (Tomlinson, 2012). Similarly, the area also seems prominent in the Thai EFL context, the focus of this paper. Various foci of evaluation can be observed from studies of EFL textbooks in Thai contexts, such as uncovering the target identities, misrepresentations of local cultures, and the limitation of genres provided in the teaching materials, among others. In terms of the cultural aspect, particularly, studies showed that commercial EFL textbooks mainly target English-speaking cultures and identities whilst local cultures have little or no representation (Labtic & Teo, 2020; Saemee & Nomnian, 2021; Shin et al., 2011; Suaysuwan & Kapitzke, 2005). Additionally, the EFL textbooks "present cultural inaccuracies and stereotypes" (Zacharias, 2005, p. 267) while mismatching the learner's experiences (Jindapitak & Boonsuk, 2018). In terms of genres, EFL textbooks lack the varieties needed to fulfil the genre demands of the Thai basic education curriculum (Jivavorranum, 2016; Ramnath, 2018), standardised exams (Jivavorranum, 2016), and further education, e.g., science fields (Kaewpet, 2009; Ward, 2009).

Despite criticisms, Thai teachers perceive commercial EFL textbooks as the source of reliable 'model language' (Ulla, 2019), ready-made instructional plans (Ulla & Perales, 2021; Zacharias, 2005), and entertaining texts (Zacharias, 2005). Moreover, the teachers show little resistance to cultural assumptions and decontextualised grammar perpetuated in EFL textbooks and teaching (Forman, 2014). The teachers' preference for commercial EFL textbooks needs problematisation due to its possible adversary effect on student learning. To guide teachers in the selection of the materials for English Language Teaching (ELT), Wuttisrisiriporn and Usaha (2019) attempted to design a localised checklist. The checklist helps determine whether the textbooks target general English language skills; however, it cannot determine whether the language features of the EFL texts included in the textbooks can help build the learners' literacy. Another way to

choose appropriate text materials is through text analysis, marshalled by a holistic linguistic framework. Text analysis using linguistics grounded on context and meaning has proven successful in determining the linguistic needs of learners across subject areas and further education by enabling educators to choose appropriate texts for developing literacy programs across levels of education. For example, Dreyfus et al. (2016) used linguistic analysis to identify the requirements of the tertiary level written text types and their language features for an effective academic literacy program at a university in Hong Kong. Humphrey and Macnaught (2016) and Rose (2020) developed text analysis frameworks for educators who are non-experts of systemic functional grammar. The frameworks enable language educators to choose appropriate texts, develop teaching materials, and design assessments for target language levels across the curriculum and students' further education.

The language of textbook materials at different education levels may also impact the learners' literacy development. At the Prince of Songkla University – the research context – science reading materials are in English, but the students' first encounter with science as a discipline is through the Thai language. This creates an issue because previously, students are learning how to do science in the Thai language. Therefore, upon enrolling at the university, students have little experience reading English science texts, making it difficult for them to access scientific knowledge in English. The closest they can be exposed to English science texts is in their EFL subject in basic education, where "science topics" are integrated into the EFL textbooks. This raises an issue whether the science texts in the textbooks resemble the language features of typical English science texts found in English science classes. The language features determine whether the EFL science texts can be "model" texts for reading that can help students transition to tertiary education.

The study reported in this paper offers an alternative approach to selecting model texts for genre-based language teaching materials involving English science texts by analysing their genres and language features. It deploys the Systemic Functional Linguistics (henceforth, SFL) framework of analysis, drawing on genre, register, discourse semantics, and lexicogrammar resources. The study is a preliminary step for an ongoing action research project aiming to develop an SFL-based genre approach program for Thai pre-service teachers of EFL.

On Systemic Functional Linguistics: Theoretical dimensions
SFL is an approach to linguistics that treats language as a social semiotic system (Halliday & Matthiessen, 2014; Martin, 1992; Martin & Rose,

2007). Through the SFL lens, the study is adequately flexible in exploring the interplay between language resources establishing the genre for a linguistically-informed choice of model texts for ELT. Furthermore, it follows the current trends of demonstrating the 'appliability' (Halliday, 2008) of SFL in the field of education across the level of schooling, e.g., primary, secondary, and tertiary (Derewianka & Jones, 2016; Dreyfus et al., 2016; Humphrey, 2016; Humphrey & Hao, 2019).

SFL follows Halliday's "model of language as text in context" (Martin & Rose, 2008, p. 9). SFL model draws from Lemke's (1993) idea of 'metaredundancy', which means patterns at one level (of language and context) are realised into patterns at another level (Martin & Rose, 2008). The relation between strata is termed realisation, in which lower strata realise higher strata (Martin & Rose, 2007). The most abstract level of context is called genre, a "staged, goal-oriented, social process" (Martin & Rose, 2007, p. 8). The definition suggests that individuals participate in genres with others for a social purpose that needs steps to achieve its purposes. Genre is configured by choices in the register, which realises patterns of meaning in language. Language is arranged from the highest level of abstraction – discourse semantics, lexicogrammar, and grapophonology. Discourse semantics is the meaning beyond the clause (Martin, 1992, 2019; Martin & Rose, 2007). Lexicogrammar deals with meaning making through clauses, groups/phrases, words, and morphemes (Halliday & Matthiessen, 2014). Morphemes are not analysed in the study, along with graphology and phonology

that deal with the more concrete end of language – the expression plane of language.

Another theoretical dimension of language is termed metafunctions. Three metafunctions relate simultaneously to one another in discursive events: ideational, interpersonal, and textual. The ideational metafunction concerns the representation of the experience of the world (Halliday & Matthiessen, 2014). Interpersonal metafunction "enacts social and personal relationships with other people" (Halliday & Matthiessen, 2014, p. 30). Ideational and interpersonal meanings are "built up in sequences of discourse, organised in discursive flow creating cohesion and continuity as it moves along", which we term textual metafunction (Halliday & Matthiessen, 2014, p. 31). These are realised into magnitudes of social contexts – field, tenor, and mode – collectively known as register variables. Field is concerned with the interactants' social activity orienting to some institutional purposes (Martin, 1992). Tenor concerns "who is taking part, the nature of the participants, their statuses and roles" (Martin & Rose, 2008, p. 11). The role of language, whether written, spoken, or multimodal, is referred to as mode. The SFL model of language and its relation to contextual variables is illustrated in Figure 1, in which genre and register are considered contextual variables, marshalling the language in use. Through the SFL lens, the study is adequately flexible in exploring the interplay between language resources establishing the genre which can be enacted to develop a linguistically-informed choice of model texts for EFL.

Figure 1
A stratified Model of Language and its Interaction with Metafunctions (adapted from Martin, 1992; Martin & Rose, 2007, 2008)
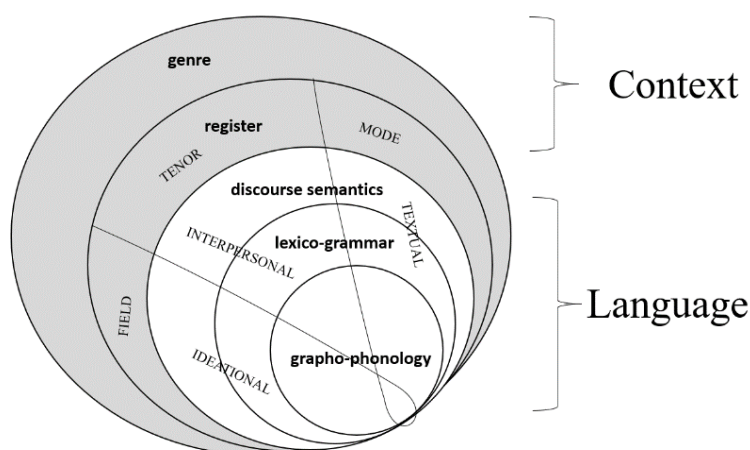
METHODS
Research Design
The study follows a qualitative linguistic analysis using SFL. It follows the top-down approach whereby the chosen text is analysed from the genre stratum to the lexicogrammar to identify its features

(see Dreyfus et al., 2016; Derewianka & Jones, 2016; Humphrey, 2016 for an elaboration of utilizing the top-down approach for educational linguistics purposes). The identified features are compared to the features of authentic scientific

descriptive report texts (e.g., Halliday & Martin, 1993; Martin & Rose, 2008; Martin & Veel, 1998).

Data and context

The study reported in this paper is a part of action research that develops a pre-service teacher education program in EFL grounded on the 'Sydney School' SFL genre approach. It focuses on how a holistic linguistic analysis of a text can inform the choice of model text to prepare pre-service teachers to teach English. We chose a text, *You Are Amazing: You Are Human!,* found in the book *Active Skills for Reading 2 (3rd edition)* (Anderson, 2013), published by National Geographic Learning, a part of Cengage Learning. The book is an official textbook in grade 8 EFL class at the Prince of Songkla University Demonstration School. Grade 8 level is chosen as it is a middle ground between secondary and high school levels where scientific descriptive report texts are introduced – the levels in which the pre-service teachers are trained to teach in the program.

Data Analysis Procedure

To achieve the purpose, i.e., making explicit the metalanguages of scientific report texts for choosing model texts in EFL, a qualitative discourse analysis informed by SFL was deployed. The text was analysed by adopting a 'top-down' approach upon collecting scientific report texts and compiling them in a small corpus. The first step to the 'top-down' approach is a genre analysis drawing on the 'knowledge of the broader "culture" (Martin & Rose, 2008), including curriculum expectations and knowledge of the unfolding linguistic patterns concerning contextual variables' (Humphrey & Hao, 2019, p. 222). Genre analysis involves identifying the Stages (the genre's local patterns) and phases (patterns within stages) (Martin & Rose, 2008). It makes a broad generalisation regarding the purposes of the texts, which can be revealed in the texts' discourse semantics and lexicogrammar features. To evaluate whether the EFL text is a good model text for teaching, a preliminary genre analysis was conducted. It was found that the text is a descriptive report, which classifies and describes the parts and functions of the human body. The text, then, was compared against the foundational genre descriptions of descriptive reports in primary and secondary school summarised in Table 1.

Table 1

Stages and Phases of the Scientific Descriptive Report (Halliday & Martin, 1993; Martin & Rose, 2007, 2008; Martin & Veel, 1998)

genre	descriptive report
stages	Classification – classifies, defines, or locates a thing or phenomenon in the scientific taxonomy
	Description – describes the features of the thing or phenomenon
phases	Description phases depend on the field and sub-field, e.g., definition, structure, functions, uses, etc.

After identifying and comparing genre features, metafunctional analyses were carried out. Under the ideational metafunction, the construal of phenomena through static relations among items or activities oriented to some global institutional purposes were identified (Doran & Martin, 2021). Ideation was deployed to achieve the purpose. It concerns the entities, dimensions, figures, and sequences (Hao, 2020). Specifically, ideation analysis covers activity sequence and taxonomy at the level of discourse (Martin & Rose, 2007). Activity sequence concerns the sequences of activities, participants, and circumstantiation represented in the discourse. Taxonomy is concerned with how the discourse classifies entities. These two analyses were chosen given that scientific genres typically engender description or classification of entities and activities relating to the entities.

The ideational resources at the lexicogrammar level involve transitivity – responsible for explicating experiential meanings, and clause complexing for managing logical meanings across clauses (Halliday & Matthiessen, 2014; Martin et al., 2010). Under the interpersonal metafunction, the EFL texts were analysed through appraisal and negotiation at the discourse semantics level. Appraisal is the "establishment, amplification, targeting, and sourcing of evaluations", whereas negotiation is the "organisation of turns into exchanges of goods, services and information" (Martin & White, 2005, p. 9). The interpersonal meanings are analysed at the clause level through mood, the "grammatical resource for realising an interactive move in a dialogue" (Martin et al., 2013, p. 56). In the textual metafunction, identification and periodicity analyses were deployed. Identification tracks participants, whereas periodicity is concerned with information flow. The textual meanings were complemented at the lexicogrammar level by theme, revealing how texts organise textual prominence across clauses. The analysis results under the three metafunctions were interpreted through the register variables. The register, discourse, and lexicogrammar features of the EFL texts were compared against the foundational descriptions of descriptive reports (Table 2).

Table 2

Descriptions of Scientific Descriptive Report Organised in Metafunctions (adapted from Martin & Rose, 2008; 2007)

		Metafunctions		
		ideational	interpersonal	textual
		field	**tenor**	**mode**
context	register	Scientific technical and specialised	Objective/impersonal Unequal/ high power Impersonal/ distant social distance	Written Organised focusing on the topic under investigation
		register is realised by (can be seen in language through the following choices in the rows below)		
language	discourse semantics	Ideation: • Activity sequence: Generic non-human entities • Taxonomy: Intricate and complete scientific taxonomy	Negotiation: • Statements giving information Appraisal: • Attitude - Appreciation • Graduation - Flags significance and precision • Engagement - Monoglossia	Periodicity: • Topics are construed in Themes Identification: • Presenting and tracking things within the text
	lexicogrammar	Transitivity: • Relational processes • Technical terms	Mood: • Subject^Finite clause pattern	Theme: • Topical themes as the point of elaboration

FINDINGS & DISCUSSION

This section presents and discusses the findings of the 'top-down' analysis of the EFL text. It starts with the text's genre features, proceeding with the presentation of features under the three metafunctions, ideational, interpersonal, and textual (see Table 2 for the summary). After reporting the linguistic features, each subsection discusses the features' implications for teaching EFL reading.

Genre

This subsection shows the EFL text's stages, phases, and purpose. The text is a descriptive report. Typically, descriptive reports have two stages, written in initial capital letters: Classification and Description (Martin & Rose, 2008) (see Table 1). However, the EFL text does not conform to the stages of a typical science descriptive report, as shown in Table 3.

Table 3

Stages and Phases of the EFL Text

Kicker	**Did you know that your small intestine is nearly six meters long?...**
Classification structure & functions	The human body is a complex machine…
Description issues	Many people do not take care of their complex machines. Bad habits like smoking, drinking too much alcohol…
treatment	Like machines, different body parts sometimes wear down from old age…
Protocol	As with any machine, the better you take care of it, the longer it will last…

The EFL text analysed has four stages realised graphologically through paragraphs. The first paragraph can be considered a Kicker. Kickers are a part of news articles and have been extensively described in non-SFL studies of media discourses (Fromm et al., 2015). Kickers, sometimes called a tagline, are one-line heads preceding the headline of a news article. Although the Kicker stage in the EFL text does not conform to the graphological layout of a typical news kicker, we use the term to refer to the paragraph's discursive function: to provoke the reader's attention (Fromm et al., 2015). The position of the Kicker makes it textually prominent. The stage is a 'trivia' informing the readers about the unknown facts about the human body in question form. The second paragraph is Classification,

reporting the structure and functions of the human body. The third paragraph is Description, which lays out the issues of human behaviour towards their bodies and alternative treatment for aging and body injuries. The EFL text ends with a protocol stage that instructs readers to take care of the human body in commanding clauses. Protocols are an independent genre aiming to control behaviours (Martin & Rose, 2008).

Descriptive reports are used to classify and describe a thing or phenomenon. However, with the extra stages, such as Kicker and Protocol, the EFL text's social purpose becomes incoherently organised: (1) entertain readers, (2) classify and describe the human body, and; (3) provide a set of ways in taking care of the body. These inconsistencies make the text difficult to classify into the scientific descriptive report genre. It seems that the text's purpose is merely to perform an EFL reading activity, not to build knowledge.

The findings have significant implications for teaching. It may be difficult for learners to understand the text because each purpose of the text construes significant shifts in discourse. Students need to be taught how to control the language for each purpose, making the learning more complex than it should be. If the learners lack the control of the language and exposure to reading texts with the stages typical to descriptive reports, they may not find the EFL texts' relevance to science disciplinary discourses – in this case, in the university science courses – where they need to read authentic science texts.

Ideational Metafunction

This section shows the most significant ideational meaning features of the EFL text from two perspectives – activity sequence and taxonomy – crucial to the overall knowledge development in scientific reports (Humphrey & Hao, 2019). In general, the taxonomy analysis reveals incomplete and inconsistent scientific taxonomies, whereas the activity sequence finds that the focal point of the text is behaviour and activities instead of things description and has low technicality.

In terms of taxonomy, the model text construes different kinds of taxonomic relations, such as part-whole relations, e.g., human body and its parts and branches of sciences that deal with the human body; and the classification of entities relating to and affecting the human body, e.g., habits, and accidents and illness. The taxonomic relations can be seen across stages and phases of the text. In the Kicker, the part-whole relations of the human body are established, though the entities are not explicitly linked, as seen in Figure 2.

In addition to part-whole relations, some compositional taxonomies are construed in the Kicker. They include knowing that your face is a part of the body and is composed of muscles.

Furthermore, readers are directed toward recognising that our bodies and hearts are mostly made up of water. After establishing compositional taxonomy in the Kicker, the text then elaborates on the relations of the human body as a class of a complex machine, as demonstrated in the Classification stage. This relation is partly because the human body contains many different organs allowing us to do many activities. However, the text does not elaborate on a more intricate taxonomy of the human body, nor does it exemplify different classes associated with the complex machine, as shown in Figure 3.

Figure 2
Compositional Taxonomy of Human Body in Kicker

Your small intestine
co-part
muscle
co-part
your face
part
our bodies
part
water
co-part
our hearts

Figure 3
Classification and Compositional Relations of Human Body in Classification Stage
The human body = our bodies
class
a complex machine
part
different organ systems and parts
part
our bodies

Rather than thoroughly describing the human body's compositional features, the text proceeds by exemplifying some issues and treatments relating to the body in the Description stage (Figure 4). It classifies some habits as bad because it would cause some problems to the body, such as *smoking, drinking too much alcohol,* and *eating junk food.*

Figure 4
Classification of Habits in Description Stage
Bad habits
class
smoking
co-class
drinking too much alcohol
co-class
eating junk food

Apart from classifying the habits, the text also uses another classification taxonomy regarding illness. However, we cannot get any details on such illnesses as they are commonly presented as something general (i.e., because of hurting and falling by themselves).

Though the taxonomy relations developed throughout the text are of various types and, in some sense, complex, they are not the relations commonly valued in scientific reports. Scientific reports focus on entities associating them with their descriptions, classifications, compositions, and activities (Martin & Rose, 2008). However, the results show that no thorough description of the human body was construed, be it the features making up the body or the functions of each part. These features make categorising the text into any subtype of scientific reports, e.g., descriptive, classifying or compositional, problematic. The ideational components per stage do not conform to the components typical of the descriptive reports, which provide deep taxonomy in terms of classification or composition, thus making the interpretation of the overall purpose of the text challenging.

The development of ideational meanings revealed in the activity sequence also seems difficult to establish. The activities attributable to the readers (and authors) seem prominent compared to the 'behaviours' carried out by entities related to the human body. In particular, the text primarily focuses on the 'human' participants doing the 'actions'. They are commonly referred to readers through pronominal *you* and sometimes include the authors, e.g., *we* and *us.* The actions vary, from 'sensing' to 'doing' and 'behaving'.

Minimal actions associated with the human body and its part are indicated (only *our hearts beat over 100,000 times each day*). The activity associated with sensing is realised by a mental clause projecting another clause such as ***Did you know*** *that your small intestine is nearly six meters long?* Another mental clause is a complex clause – *we get sick or **feel** pain that we **notice**.* Another activity clause is an embedded relational clause, *The body has many different organ systems and parts that work together to allow us to breathe, move, see, talk, and digest food all at the same time.* The other activities contributing to establishing a dynamic perspective of the field (Doran & Martin, 2021) are commonly realised through material clauses at the lexicogrammar stratum. However, as far as the field is concerned, the activities seem to be varied as they attribute different participants responsible for the actions, e.g., *Many people **do not take care of** their complex machines; Bad habits like smoking, drinking too much alcohol, and eating junk food **damage** our bodies; Stress **can** also **cause** health problems.* There are very minimum activities associated with the human body.

Another notable feature observed in the text is that it instructs readers to do something, which is uncommon in the scientific report. A negative imperative realises the instruction *don't forget to smile.* Having this at the end of the text would alter the purpose of building knowledge about the human body to instruct something to happen. This feature is typical of the Protocol genre, commonly found in a more technical discourse in the science field, such as operating technical apparatus in the lab (Martin, 1992; Rose et al., 1998). However, we cannot judge the text as having a 'high' technicality in terms of the field because it does not have many technical terms. Instead, the terms are relatively 'every day', not requiring formal training to make sense. Martin (1992) termed texts with this characteristic as 'common sense discourse' (p.545). It may be argued that common sense texts can be a good starting point for learning science. However, Halliday and Martin (1993) warn about teachers' latency to common sense materials:

> …common sense knowledge can be a very useful starting point for learning science, since it organises the world in ways that can be clearly related to scientific understandings. At the same time, it is clear that commonsense understandings differ from scientific ones and that schools have a crucial responsibility to induct students into the alternative scientific world views. Teachers need to be constantly aware of the dangers of stranding students in their own words. (p. 170)

In terms of the genre-based teaching practice developed in the research project, common sense discourses can be established during the initial part of the teaching and scaffolding the student's way into a more scientific way of viewing the world. Ideally, the text should be a resource to establish this. However, the establishment is hardly possible with the text's incomplete taxonomies and untypical entities and figures in the activity sequence. In other words, the text can hardly be used to support students reading exposure to texts that build scientific knowledge in English. Hence, the EFL text cannot be accounted for as a model text from the ideational perspective.

Interpersonal Metafunction

The section solely reports the interpersonal meaning features of the EFL text most relevant to its evaluation of being a good model text. The appraisal and negotiation analyses revealed the author's editorialisation of the human body in low social distance. Specifically, the editorialisation is construed in appraisal resources in the graduated positive evaluation of the human body, graduated negative evaluation of behaviours against the human body, coupling to culturally legitimise author's

evaluations and inadequate scientific sources of facts. Negotiation resources construe editorialisation through interpersonal metaphors realised in negotiable mood structures. These features are interpreted through tenor and ideology, and their implications for teaching are discussed.

The most prominent appraisal features of the EFL text are its positive appreciation of the human body (Excerpt 1) and negative evaluation of behaviours unbeneficial to the body (Excerpt 2). The resources are realised in appreciation, judgment, graduation, coupling, and engagement. The yellow highlight indicates attitude resources; underline for graduation resources; (+) for the positive category of attitude; (-) for negative attitude; (↑) for upscaling the intensification; (↓) for downscaling.

Excerpt 1
Positive Appreciation of the Body

Did you know that your small intestine is nearly six meters long? [+appreciation; ↑graduation]

Or that there are about 60 muscles in your face, [+appreciation; ↑graduation] and you use 40 of them to frown' [+appreciation; ↑graduation] but only 20 to smile? [+appreciation; ↑graduation]

You really are amazing! [+appreciation; ↑graduation]

The first and second sentences exploit recurring graduation resources to appreciate the human body positively. Graduation is the up/downscaling of attitude and engagement resources (Martin & White, 2005). Using graduated numeric values (underlined), the author creates 'factual' ideational meanings showing how 'complex' the human body is. These resources graduate the invoked positive appreciation towards the human body. Appreciation is the institutionalised reworking of "feelings as propositions about the value of things" (Martin & White, 2005, p. 45). The third sentence construes inscribed positive appreciation towards the human body graduated graphologically with an exclamation.

Conversely, behaviours unbeneficial to the body and people behaving against it are negatively evaluated. An example is shown in Excerpt 2.

Excerpt 2
Negative Evaluation of Habits Against the Body

Many people do not take care [-judgment; ↑graduation] of their complex machines.

Bad habits [-appreciation] like smoking, drinking too much alcohol [↑graduation],

and eating junk food [-appreciation] damage our bodies. [-appreciation]

The first sentence invokes negative judgment of people behaving against their bodies realised by the process *do not take care.* In the second sentence, the negative appreciation of bad habits is coupled with negative appreciation of exemplified behaviours (bold). Coupling combines ideational meanings and appraisal (Martin, 2010) at a repeated co-patterning of meanings in a text (Painter et al., 2012) relevant to the communities of the culture (Knight, 2010). The evidence suggests that the author uses polarisation and coupling strategies to exploit the shared cultural values in maintaining physical health. The resources allow the author to establish solidarity by reproducing the health discourses acceptable in health education contexts. These shared cultural values are supported by engagement resources, the source of appraisal (Martin & Rose, 2007). Descriptive science reports are typically monoglossic in which "the source of attitude is the writer" (Martin & Rose, 2007, p .49). Contrariwise, the EFL text construes some heteroglossia, in which "the source of attitude is other than the writer" (Martin & Rose, 2007, p. 49). Sources of heteroglossia observed in the EFL text are provided in Table 4.

Table 4 shows that the attitude comes from two sources, predominantly the author (89.47%) and studies (10.53%).

The author renders subjective evaluations of the human body and people's behaviours toward them. Interestingly, the external authority, *studies done by the Australian government*, is not used as an objective resource of information but as a means to warrant the author's negative judgement on the people who are not taking care of their body.

Table 4
Sources of Appraisal

Sources	Ratio	Percentage
Author	17/19	89.47%
Studies	2/19	10.53%

Negotiation resources of the EFL text construe a dialogic interaction with the readers in contrast with the monologic nature of authentic science texts. The interaction is apparent in the Kicker and Protocol stages. In the Kicker stage, the author engages with the readers through questions (Excerpt 3). The excerpt is coded as ↘ for realisation and ^ for sequencing.

Excerpt 3
Questions in Kicker

Did you know that your small intestine is nearly six meters long? [give information↘question] [mood: Finite^Subject]

Or that there are about 60 muscles in your face, and you use 40 of them to frown' but only 20 to smile? [give information ↘question] [mood: Subject^Finite]

How about the fact that our bodies consist of 73 percent water, and that our hearts beat over 100,000 times each day? [give information↘question] [mood: Finite^Subject]

The sentences are supposed to be declarative as they give information. However, they are rather construed (↘) incongruently by rhetorical questions in Finite ^ Subject form, with an exception to the second sentence in Subject ^ Finite form but still graphologically a question. This is an example of an interpersonal metaphor that interactants use to negotiate their tenor relations (Halliday & Matthiessen, 2014). Through this linguistic configuration, the author shifts their role from what Berry (1981) refers to as the primary knower to the secondary knower. In information exchanges, the primary knower "has the authority to adjudicate information," whereas the secondary knower "receives the professed information" (Martin & Rose, 2007, p. 238). In tenor relations, it is evident that the author tries to render dialogic space by disguising as a receiver of the information to neutralise their power over the readers. Interpersonal metaphor is also used in the Protocol stage. For example, the speech function of the last sentence of the protocol is to give information. However, it is realised by an imperative clause in implicit Subject^Finite mood structure (Excerpt 4).

Excerpt 4
Imperative Clause in Protocol

Oh, and don't forget to smile! [give information↘imperative]

Oh, and	(you)	don't forget to smile!
	Subject (implicit)	Finite
	Mo…	…od

The mood structure paired with the clause function allows the author to negotiate a command to the readers. This is construed in the clause coded in yellow, realising a 'mental process of cognition'. Mental processes can function in negotiations as 'explicitly subjective' interpersonal realisation, in which the author is 'explicitly responsible' for the proposition (Martin et al., 2010, p. 236). In this text, the author proposes the readers to smile but explicitly puts the responsibility on the reader by adding a mental process, 'don't forget'. This results in lowering the author's authority over the readers.

Overall, the interpersonal analysis reveals the author's negotiation of tenor relations to the readers for a dialogic form, closer social distance, and lower authority. The EFL text trivialises and editorialises the human body by shaping the readers' values and behaviours towards it. The purpose of editorialisation seems to provide entertainment and perhaps health education. The subjective evaluations and dialogic features of texts are typical in popular science texts (Babaii et al., 2017). Furthermore, they reveal the pedagogical basis where the text is grounded – Communicative Language Teaching (CLT). This phenomenon can be interpreted under Martin's (1992) concept of ideology, where the text's cultural (in this case, pedagogical) inclinations become the source of semogenesis – the process of meaning creation (Halliday & Matthiessen, 1999). The results reflect Zacharia's (2005) findings that teachers using EFL textbooks grounded on CLT usually find the texts entertaining. CLT educators

may argue that these resources may have significant implications in grasping young learners' reading interests in scientific texts. However, these features may consequentially become an encumbrance as science reports are typically objective, monogloss, and construe statements giving information (Halliday & Martin, 1993; Martin & Rose, 2007, 2008; Martin & Veel, 1998). The text, however, is personal and subjective with heteroglossia, questions, and command clauses. Using a text that does not comply with institutionalised interpersonal resources may hinder learners' control of the interpersonal discursive features acceptable to scientific communities. In other words, EFL learners may struggle to institutionalise evaluation resources, leaving them stuck in subjective science reporting. It may disadvantage them in fulfilling the demands of science reading at a higher level in their further education and professional lives (Rose et al., 1998; Rose & Martin, 2012).

Textual Metafunction

After considering both interpersonal and ideational meanings of the EFL science report, this section demonstrates how textual meaning resources weave together the interpersonal and ideational meanings construed in the text. It shows the results in periodicity and identification at the discourse semantics level and is complemented by Theme analysis in lexicogrammar.

The scientific descriptive report, as has been well described under the SFL framework of analysis, begins with a General classification stage – informing readers about the categories/classes an entity belongs to – then followed by Description stages – describing features, functions, and behaviours of the entity reported (Martin & Rose, 2008). These two Stages are established mutually through interpersonal, ideational, and textual resources. From textual resources, this can be seen from how the participants are introduced and tracked across texts and the shift in which the 'topic' changes paragraph by paragraph.

The scientific text analysed in this paper does not seem to align with the scientific report genre convention. The text's textual meaning resources can confirm such unsuitability. First, rather than providing a clear General classification stage, the text puts a 'trivia' in which interpersonal meanings are foregrounded. From a textual perspective, this plays a significant role in predicting what comes in the text – a higher-level Theme (Martin & Rose, 2008). However, as the text unfolds, this 'trivia' cannot be considered as the anchor of which the text develops. In this Stage, rather than presenting generic entities, some specific entities are introduced, e.g., *your small intestines, muscles in your face, our bodies,* and *our hearts.* Through possessive realised by pronominals, the entities specifically refer to readers' possession. Concerning

the textual meaning, the entities introduced in 'trivia' are expected to be a point of departure of the entire text development or 'macro-Theme' in Martin and Rose's (2007) terms – readers would anticipate that such entities would further be described in the text.

Second, following the 'trivia', the text briefly provides information regarding parts of the human body and their functions in the Classification stage. It starts by putting *the human body* as a hyperTheme predicting the development of information within the stage (Martin, 1992; Martin & Rose, 2007, 2008). It then shifts the attention to the durative nature of knowing some functions of the human body, utilising a marked Theme *From the day we are born.* Then, the Theme returns to *the body* – relating the body with the possession of its parts/organs and describing them regarding their contributions to activities such as breathing, moving, talking, and seeing. Following the General classification, the text captures some descriptive features of the body. However, such descriptions do not relate to the parts/organs, nor do they elaborate on the functions of organs mentioned in the General classification. Instead, a series of Description stages describes some issues relating to the body, especially when people do not take care of it and some available treatments. Within the issues, from the textual perspective, people entity such as *many people, people who… we, a lot of people, far more people,* and *they,* dominates the point of departure of the message (Halliday & Matthiessen, 2014), referred to as Theme at this phase. Other entities introduced and tracked at this phase include *bad habits*, *stress,* and *studies done by the Australian government.*

Reasoning along similar lines, the next descriptive phase does not focus on describing entities relating to the body. This phase shifts readers' attention to some treatments that people can use, especially elderly people, concerning their bodies. From a textual perspective, this phase seems to provide information that would deem suitable for the elderly as they dominantly play a role as a Theme at this phase and an entity that is frequently tracked. This strengthens the point that rather than providing generic information regarding the classification or taxonomy of the entities (Martin & Rose, 2008), the text shifts the attention to other irrelevant information regarding the human body. One interesting point can be observed towards the end of the text: some commands instructing readers to do something. They are realised in imperatives – indicating that the text is in the realm of instructing, not informing. Having this Stage at the end of a scientific report is bizarre as the primary social purpose of such genres is to inform.

Regarding science discipline, the discourse is organised as 'coherent, explicit, and systematically principled structure, hierarchically organised'

(Bernstein, 2000). The EFL text analysed cannot be a good model for teaching the scientific genre in English. Apart from having an unclear social purpose, as revealed within genre analysis, the textual meaning resources found in the text cannot even be considered a match to the one commonly found in scientific discourse. The interaction of appraisal resources in the Kicker stage cannot be seen as the textual peak of the text or the macroTheme responsible for managing the organisation of text as a whole. Similarly, the Protocol found at the end of the text does not play as macroNew, consolidating what has been described throughout the text.

CONCLUSION

The paper has demonstrated how linguistic analysis can inform the choice of model text for EFL reading. Through an SFL-informed detailed qualitative linguistic analysis of a scientific report from an EFL commercial textbook, the study revealed that the chosen EFL text does not conform to the foundational features of scientific descriptive report texts. The EFL text construes extra stages such as Kicker and Protocol aside from the canonical Classification and Description stages in the genre stratum. Its ideational resources construe behavioural activities, incomplete scientific taxonomies, and relatively everyday language. Interpersonal analysis reveals the author's dialogic negotiation, low authority, and close social distance from the readers. The EFL text's textual meanings reveal the incoherence in the periodic flow of the information and the external people entities referring to the readers. These features bypass the standard textual features of authentic scientific descriptive reports, i.e., topical Themes as the point of elaboration and internal tracking of entities.

Based on these features, we suggest that the EFL text's social purpose is not to build scientific knowledge but to perform an EFL reading activity merely. As mentioned previously, most science textbooks in Thai basic education are written in Thai; therefore, having EFL reading materials under science topics can allow them to read authentic science texts. Though it seems to be a significant problem, the purpose of EFL science texts is not to build scientific knowledge but to develop the learners' English language competence. The use of EFL science texts that do not conform to the genre and language features of authentic science texts may create issues in the transition of the science major students from basic education to the university level, where they are asked to read science texts in English. It may also implicate significant difficulties in learners' future participation in specialised academic and professional contexts.

The paper has provided insight into how SFL can be used as an alternative approach to evaluate and choose model texts for teaching EFL reading, which is sensitive to the success of learners' transition to tertiary education. It shows how a holistic linguistic analysis can be used for a systematic, critical, and linguistically-grounded evaluation of texts for teaching EFL reading. Such analysis can help educators choose EFL texts grounded on linguistic evidence. Moreover, it helps them consider what matters, i.e., learners' further education and professional opportunities, and helps them redesign their teaching practice.

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