A multimodal discourse analysis of international postgraduate business students' finance texts: an investigation of theme and information value

Hesham Suleiman Alyousef

Published online: 21 Dec 2015.

Submit your article to this journal 🗗

View related articles 🗗

View Crossmark data 🗗

Routledge
Taylor & Francis Group

A multimodal discourse analysis of international postgraduate business students' finance texts: an investigation of theme and information value

Hesham Suleiman Alyousef

Department of English & Literature, King Saud University, Riyadh, Saudi Arabia

ABSTRACT

Thematic progression patterning and the composition of information value facilitate the development of well-structured messages. The text-based research of systemic functional linguistics (SFL) into textual features has been confined to language learning and workplace contexts. Empirical research studies involving finance have investigated students' performance in finance courses and the effects of class attendance on their performance. However, no published studies have yet explored or analysed the textual features of tertiary finance texts. This study investigated the Theme and information value in 6 group assignments in finance, written by 19 Master's students in accounting. Underpinned by Halliday's SFL and Kress and van Leeuwen's system of the composition of information value, this study employed a systemic functional multimodal discourse analysis (SF-MDA) of the texts. The SF-MDA revealed a high frequency of Theme reiteration patterns, the rare occurrence of a linear Theme pattern, and the minimal use of a multiple-Theme pattern. These findings have both theoretical and pedagogical implications for the teaching and learning of writing, particularly in the context of teaching English for business purposes.

Introduction

Thematic progression patterning and the composition of information value facilitate the development of well-structured messages, thereby providing a text with cohesion. The Theme is the first constituent of a clause that a speaker/writer selects to ground a message, whereas the remaining element of the message that develops the Theme is the Rheme. Halliday (1994, 38) defines Theme as "the point of departure for the message". For example, "John" in the sentence *John woke up late this morning* is the Theme, and the remainder of the sentence is the Rheme. Theme/Rheme are conflated with the information focus functions Given/New. Given/Known information, unlike New, is related to information that occurs in the text or to knowledge that is shared by the reader/writer or speaker/hearer (Flowerdew 2012). Given/Known information typically precedes New information in English clauses. An awareness of these textual features helps students to write naturally flowing texts, thereby enhancing their language literacy. The

text-based research of systemic functional linguistics (SFL) into these features has been confined to language learning (Ebrahimi and Ebrahimi 2012; Jalilifar 2010; Medve and Takac 2013; Mellos 2011) and workplace contexts (Bargiela-Chiappini 2009; Camiciottoli 2010; Clatworthy and Jones 2001; Grant, Hardy, and Putnam 2004; Westwood and Linstead 2001). In addition, empirical studies of finance have only investigated students' performance in finance courses (Biktimirov and Klassen 2008; Sen et al. 1997) and the effects of class attendance on students' performance (Chan, Shum, and Wright 1997; Chen and Lin 2008). Similarly, research studies in accounting have investigated the readability of accounting narratives in financial accounting textbooks, as measured by the lengths of words and sentences (Bhatia 1993; Davidson 2005), and lexical choices, as measured by word choice and frequency of use (Conaway and Wardrope 2010; Hyland 1998; Rutherford 2005).

Academic literacies are construed in the present study as sets of socially situated multi-modal literacy and numeracy social practices. SFL, the social semiotic approach to language developed by Halliday (1978, 1994), views language as a social semiotic resource for creating meaning and constructing knowledge within social contexts. SFL suits the context of the present study because it considers the functions of language in social inter-actions and provides powerful analytical tools for foregrounding the processes through which students construct discipline-specific knowledge in a community of practice. The scope of SFL is broad: it explains how humans create meaning in language (both spoken and written) and in various semiotic resources (visual/written, oral/aural, haptic, etc.) that represent the mode of discourse – a textual feature that will be discussed next.

The meaning-making functions in Halliday's (1994) approach to language are grouped into three language metafunctions for construing (or organising) meaning: *ideationally*, by representing and ordering our experiences, perceptions, consciousness, and basic logical relations (oriented towards the field of discourse); *interpersonally*, by enacting certain social relationships (oriented towards the tenor of discourse); and *textually,* by weaving ideational and interpersonal meanings into a textual whole (oriented towards the mode of discourse). The three language metafunctions provide useful linguistic tools for a sys-temic functional multimodal discourse analysis (O'Halloran 2008b, 2009, 2011) (henceforth SF-MDA) of texts: Transitivity (types of processes or verbs), Mood (speech function) and Modality (obligation and degree of certainty or usuality), and Theme and Information Structure. These metafunctions are correlated, respectively, with the three register vari-ables of field (what is talked about), tenor (how social roles and identities are constructed), and mode (how meanings are organised). These tools provide powerful linguistic resources for an SF-MDA. As Alyousef (2013, 44) stated, "SF-MDA indicates a potential research tool for the systemic functional analysis of the multimodal finance and account-ing discourses".

Due to space constraints, this study aims to explore and analyse the textual metafunc-tion of a key topic in a *Principles of Finance* course, namely management reports utilising capital budgeting (or project valuation) techniques, which is among the most commonly studied subjects in finance courses (Brigham and Houston 2009). The textual metafunction is construed by Theme and Information Structure systems and plays a major role in the unfolding of finance texts. Garzone (2009, 156) noted that "so far, contributions from lin-guists specifically dealing with multimodality in business discourse have been relatively few". As business discourse is an internationally growing field of research, the *Principles*

of Finance course suits the aim of my study – in addition to heeding Garzone's advice – because it is one of the foundation courses in the Master's of Commerce Accounting programme. Similarly, Lea and Street (2006) argue that multimodal analysis reveals the range of meanings expressed in learners' activities and genres and posit that multimodal analysis aids in theorising "the multimodal nature of literacy, and thus of different genres, that students need to master to represent different types of curriculum content for different purposes, and therefore to participate in different activities" (373). The present study is, to the best of my knowledge, the first of its kind to explore the manner in which international postgraduate business students construct cohesive, multimodal finance texts.

Literature review

As this paper aims to investigate salient multimodal textual features and the manner in which business students construct cohesive finance texts that encompass graphs and tables, it is pertinent to provide an overview of Halliday's (1994) Theme and Information Structure systems and Kress and van Leeuwen's (2006) multisemiotic framework for the analysis of textual organisation in images.

Theme and Information Structure are the major structural systems within the textual metafunction in Halliday's (1994) SFL approach because they facilitate the development of well-structured message, thereby providing cohesion within language. As Halliday and Matthiessen (2014, 94) state, "thematic and information structure carries the rhetorical gist of the clause". Both choices within Theme and Information Structure systems contribute to a text's cohesion. Thematic progression analysis, therefore, aims to explore the development of information within a text. The notion of thematic progression was first introduced by Daneš (1974) and later developed by Fries (1981) and Halliday (1994).

Theme involves three major systems: choice of type of Theme, choice of marked or unmarked Theme, and choice of predicated or unpredicated Theme. There are three different types of Theme (Table 1): topical, interpersonal, and textual. The most obvious thematic progression pattern in a text is the linear (or "sequential"/"zig-zag") pattern, by which information placed in Rheme position is packaged in a subsequent Theme. This pattern results in a cohesive text through cumulative development, which is based on newly introduced information. Another thematic pattern that is drawn on to manage information flow is referred to as the multiple-Theme (or fan) pattern. This pattern involves a clause (typically at the beginning of a paragraph or a text section) that introduces a number of different pieces of information, each of which is then picked up and used as

Table 1. Theme types.

|	
Topical Theme	Participant
	Circumstance
	Process
Interpersonal Theme	Vocatives (e.g. *Henry! Sir!* …)
	Modal or comment adjuncts (e.g. *probably, usually, frankly,* …)
	Finite elements (e.g. *modal auxiliaries, 'be' auxiliary,* …)
	WH-question words (*who, what, where, when, why, how*)
Textual Theme	Continuatives (e.g. *umm, yeah,* …)
	Conjunctions (e.g. *and, or, but*)
	Conjunctive adjuncts (e.g. *however, therefore, because, although,* …)
	WH-relatives (e.g. *which, who,* …)

a Theme in subsequent clauses. A third form of thematic progression re-iterates or maintains the Theme's focus rather than developing it and is referred to as Theme re-iteration (or parallel) pattern. In this pattern, the repetition of a particular element typically provides a clear focus for the text. Martinec (1998, 162) posits that the feature selections and structures of textual meaning "enable the ideational and interpersonal ones to form the cohesive wholes called phases". Thus, any stretch of text can be said to be cohesive when it is consistent in experiential, interpersonal, and textual meaning.

An unmarked Theme indicates "the most typical/usual" choice (Eggins 2007, 318), whereas a marked Theme refers to an "atypical, unusual" choice. The latter is a variation of the unmarked, whereby focused information is *foregrounded*. The unmarked Theme is conflated with the Mood structure constituent, that is, Subject (in a declarative clause), Finite (in an interrogative), Predicator (in an imperative), or WH (in a WH-interrogative). The marked Theme is conflated with an adverbial and prepositional group/phrase to provide circumstantial details about an activity, such as the Theme in "In this group assignment" in the sentence "In this group assignment, we will practise capital budgeting techniques", which moves to the thematic position. Another unusual case of marked Theme that occurs in conversations is when the Theme is conflated with the Complement, which more often follows the verb, as in "*some of the comments* I've scrubbed out". The clause's initial Subject "I" is an unmarked Theme. Eggins (2007, 320) argues that "skillful writers and speakers choose marked themes to add coherence and emphasis to their text" through the use of Theme Predication.

The system of Information Structure consists of two functional elements, Given and New, which are marked off in speech by a pitch contour or tone. New information is typically marked by tonic prominence because it refers to "what is new or unpredictable"; therefore, it carries the information focus; Given information precedes the New and refers to "what is already known or predictable" (Halliday and Matthiessen 2014, 89). As the present study is concerned with written multimodal texts, the phonological indices of the Given and New Structures were not investigated; instead, Kress and van Leeuwen's (2006) system of composition was employed in the analysis of the textual organisation in tables and graphs, as discussed below.

In his book *The Language of Displayed Art*, O'Toole (1994) was the first to utilise SFL in MDA. As Martinec and Salway (2005, 339) state, SF semiotics is "the one theoretical framework whose followers have concerned themselves with [intersemiotic] relations between images and texts". It is essential for ESL/EFL learners to understand and interpret image–text relationships because they are increasingly used in academic writing. Kress and van Leeuwen (2006) first outlined methods to analyse the textual layout in images through systems of composition, framing, and salience. The first system is achieved by means of the inter-semiotic principle of in formation value compositional zone layout (Given-New, Ideal-Real, important or less-important compositions) shown in Figure 1.

The "information value" compositional zone layout is presented in terms of zones: Centred, Circular, mediator composition, horizontal (or left-right) Given-New compositions; and vertical (or up-down) Ideal-Real compositions. The systems of framing and salience are expressed through visual framing and salience features. Whereas the semiotic potential of visual framing is the separation of elements by frame-lines, pictorial framing devices, empty spaces, etc., salience attracts a reader's attention through the semiotic resources of position, size, tonal value or colour, sharpness, etc. (Van Leeuwen 2005a). As capital budgeting
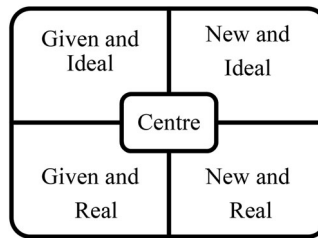
Figure 1. The grammar of visual artefacts in terms of compositional zones (Kress and van Leeuwen 2006).

reports in finance texts encompass graphs and tables, Kress and van Leeuwen's first system, the composition of information value, suits the context of my study. Bateman (2011, 52) expressed the need for "more empirically grounded analysis of a broader range of multimodal documents" to verify or disprove Kress and van Leeuwen's interpretations of the composition of information value. Next, I present a review of the relevant literature that considers SFL and multimodal communication and representation.

SFL's text-based research in multimodal communication and representation has been confined to language learning (Ebrahimi and Ebrahimi 2012; Jalilifar 2010; Medve and Takac 2013; Mellos 2011) and workplace contexts (Bargiela-Chiappini 2009; Camiciottoli 2010; Clatworthy and Jones 2001; Forey 2002; Grant, Hardy, and Putnam 2004; Westwood and Linstead 2001). Bargiela-Chiappini (2009) reviewed a range of historical, cultural and methodological perspectives among business discourse studies in workplace settings. Thomas (1997) investigated thematic progression in a series of management messages in the annual reports of a company, and the findings showed a significant decrease in the use of the personal pronoun "we" from 1984 to 1988, along with a corresponding increase in the use of inanimate nominal groups as themes, such as "fiscal 1988" and other typical business terms. Camiciottoli (2010) found that discourse conjunctive devices in financial disclosure texts were more frequent in earnings presentations than in the earnings releases, suggesting that their pragmatic use influences the interpretation of the message. Similarly, Hawes (2015) compared and contrasted thematic progression in 20,000-word texts written by professional journalists with texts of comparable length written by 18 international students in a pre-MA course entitled Inter-Communication. Similarly, Forey (2002) investigated the function performed by Theme in workplace texts consisting of 30 memos, 22 letters, and 10 reports. The findings showed that Theme plays an important role in organising the texts, as well as in realising ideational and interpersonal meaning. In particular, the findings showed that marked Theme plays a crucial role in representing the workplace as a depersonalised, material world. Interpersonal Theme was realised by similar features across the three types of texts. Clatworthy and Jones (2001) investigated the effect of thematic structure on the extent of readability variability in 60 chairperson statements and found that the introduction was systematically easier to read than other parts of the statement, contradicting prior objective research on accounting narratives. The results indicated that the thematic structure in the statement was a key driver of the variability of annual reports' readability. Wake (2006) investigated the effectiveness of dialogic negotiations in the economics tutorial language of five Chinese-Malaysian students with Engineering and Business Communication majors

during the course of a semester. The findings showed that linguistic transformations in understanding were "not at all neatly incremental as described in the literature" (317) because the semiotic mediation process was largely "devolutionary". (Semiotic mediation is a process of semiotic remediation (or reformulation) of discourse.)

Whereas multimodal communication research has been conducted across the fields of mathematics (O'Halloran 1996, 2000, 2005, 2008a, 2009), history (North 2005), science and computing (Drury, O' Carroll, and Langrish 2006; Hsu and Yang 2007; Jones 2006; O'Halloran 2000), journalism and media (Hawes 2015), and nursing (Okawa 2008), applications of SFL in studies of tertiary business discourse are limited. For example, Okawa (2008) investigated the process of constituting the academic literacy practices of a Japanese first-year nursing student. Data were collected through classroom observations, interviews, and document analysis. Okawa employed SFL in the analysis of texts to investigate discourse at the epistemological level and texts at the lexico-grammatical level. This methodology in turn enabled Okawa to trace the close relationships between assignments and literacy practices in nursing. The findings showed that discipline-specific knowledge is acquired through socialisation into a particular discipline. An example of SFL-based study of tertiary business discourse is Alyousef (2015), which examined the system of Theme and the composition of information value in tertiary management-accounting multimodal texts. The findings revealed the frequency of two thematic progression patterns: Theme reiteration and the linear pattern. Theme reiteration was used to define the accounting numerical values in the budgeting tables. Thematic choices in the budgeting tables were constrained by the authoritative source of knowledge in presenting the information structure in accounting statements. Along similar lines, Alyousef and Alnasser (2015a, 2015b) investigated the use of cohesive devices in tertiary management-accounting texts and in a *Principles of Finance* course. The findings of both studies revealed that lexical cohesion formed the largest percentage of use in the two texts, particularly repetition of the same lexical items, followed by reference. Finally, Alyousef (2013) and Alyousef and Mickan (Forthcoming) investigated the experiential meanings of tertiary finance texts and tertiary management-accounting texts, respectively.

The literature review shows that the use of Theme and the composition of information value in tertiary finance texts remain unexplored. Although management reports utilising capital budgeting techniques are among the most commonly used genres in finance courses, there remains a lack of a text-based investigation of international students' multimodal texts.

Having presented an overview of Halliday's (1994) two textual systems and Kress and van Leeuwen's (2006) methods for the analysis of textual layout and having reviewed the literature relevant to the present study, I next describe the data and method of analysis.

Data and method of analysis

The corpus consisted of 6 group assignments (14,857 words) in a *Principles of Finance* course, written in English by a total of 19 Master's of Commerce Accounting program students – Group 1 (2483 words), Group 2 (1975 words), Group 3 (3386 words), Group 4 (1487 words), Group 5 (4165 words), and Group 6 (1361 words) – excluding the cover sheets, table of contents and appendices. Each of the six groups consisted of 2–4 students. The

participants were given pseudonyms: Abdulhadi, Saud, Jim and Cathy (Group 1); Abdulrahman and Jiang (Group 2); Ibrahim, Hasan, Sharon and Tracey (Group 3); Othman, Edward, and Ming (Group 4); Abdullah, Ali, Barrientos and Ritta (Group 5); and Khaled and Naser (Group 6). Although the six groups had different assignment task sheets, they were comparable because the main topic underlying the tasks was similar, except for the second part of Group 1's task sheet (portfolio management), which was excluded. The groups were required to apply the theoretical framework for capital budgeting techniques in practice by writing a management report. The term "capital budgeting" refers to a process in which a business determines whether a project (a product) is worth pursuing. Because the groups enrolled in this module in different semesters, only the first three groups were required not to exceed a 2000 word limit.

I used the nomenclature of SF-MDA (O'Halloran 2008b, 2009, 2011) to explore the salient multimodal textual features of management reports and to explore the ways in which international postgraduate business students construct cohesive finance texts. The SF-MDA drew on Halliday's (1994) analytical tool of Theme and Kress and van Leeuwen's (2006) multisemiotic framework for the analysis of images in terms of information value. The two tools seem to be suitable for the purpose of this study because they reveal the ways in which students organise multimodal finance texts. In other words, the SF-MDA seeks to provide an explanatory account of how multimodal finance discourse is typically constructed. The analysis of the composition of information value in the management reports aimed to determine whether Kress and van Leeuwen's interpretations of visual layout were in accordance with the multimodal semiotic modes in finance.

Following Halliday and Matthiessen (2014), the independent clauses in tables and graphs were numbered and annotated to calculate the frequency of occurrence of each Theme type across the six group assignments. Ellipsed experiential Themes were not included in the SF-MDA. Because the texts included tables and graphs, instances of implicit Theme patterns were manually coded. Numerical values in the tables were annotated as New if they were not provided on the group assignment task sheet. I utilised the students' intuitive understandings or the intended reading paths (Van Leeuwen 2005b) of the graphs and my reading of the course textbook (Brigham and Houston 2009) to transcribe and annotate the frequency and nature of Theme patterns. Then, a percentage was calculated for each type of pattern by dividing the sub-total number of occurrences of each pattern by the total number of occurrences of the overall Theme patterns and multiplying this number by 100. The result yielded the frequency of occurrence of each pattern among the total instances of Theme patterns in a text. The percentage total of Theme patterns totalled 100%. The use of numerical/quantitative data in this study aimed to render terms such as "higher", "fewer", and "most" more precise. Next, I elaborate the findings and discuss the SF-MDA of Theme and the composition of information value.

Results and discussion

The social purposes of the group assignment task were to evaluate the best investment alternative by applying capital budgeting techniques and presenting the findings in the form of a management report. This task was allotted 15% of the total grade for this course. Group 5 achieved the highest grade in this report, 89 out of 100, compared with the other four groups, whose grades ranged between 72 and 84.

Both Group 1 and Group 3 far exceeded the maximum word limit of 2000 words. All six groups used tables and graphs as tools to present the findings of their calculations and to facilitate comparability among the investment proposals. Group 1 used tables and graphs more than the other five groups, which might explain why that group exceeded the required number of words by 25%. The 6 group assignments encompassed 78 tables and 19 graphs. These semiotic visual modes play crucial roles in encoding numerical data in the most economical manner, as presented in the findings of the SF-MDA.

The SF-MDA of the six reports for patterns of thematic progression (Table 2) revealed an extensive use of the Theme reiteration (or parallel) pattern, particularly in the tables and the graphs.

The reiteration of a theme in a text typically serves to provide a strong topical focus by presenting additional information or offering further explanation. However it achieves other functions in a management report. Theme is reiterated in tables and graphs when comparing projects, defining and/or describing the value of accounting categories, spotting trends, and making decisions by conducting comparative judgments of various figures that assist in drawing conclusions. For example, Group 2 used Theme reiteration to provide a strong topical focus and to decide which of the two units would provide the greater economic benefit (Figure 2).

The table in Figure 2 includes five instances of Theme reiteration pattern, with the Theme of each clause in column 2 taken as the Theme of the ensuing clause in column 3, thereby constituting an implicit relational identifying clause expressed by some form of the verb *be* that links the Rheme with the Theme. For example, the first row can be interpreted as "*Present Value* for the Dome Unit [is] −30588.79. *Present Value* for the Tanning Bed [is] −20567.36". These clauses have *thematic equative* structures (Halliday 1967) that are imbued with thematic nominalisations – nominalisation is a process in which verbs and other words are changed into nouns. Nominalisation thus packs information into the theme position, making the text denser through the use of noun phrases, such as "Present Value". Nominalisation is an important feature characterising academic writing. Thus, the meaning of the clause "Present Value Dome Unit −30588.79" is something like "the present value of the future cash flows from the Dome Unit investment is [Process; Implicit Relational Identifying] −30588.79". Eggins (2007, 326) argued that nominalisation "makes the Theme reiteration pattern a powerful means of creating cohesion in written text". Similarly, Table 3 on "Required Number of Aircraft Calculations" includes 10 instances of Theme reiteration; Group 5 reiterated each Theme in column 1 twice for Y-2 and Y-3 to facilitate comparability.

Table 2. The frequency of thematic progression patterns in the six texts.

Group	Reiteration (or parallel)				Linear (or zig-zag)		Multiple-theme		Total instances	
	Freq									
	Text	Tables and graphs	Total	%	Freq	%	Freq	%	Freq	%
One	33	172	205	91.52	19	8.48	0	0.00	224	100.00
Two	15	126	141	92.16	12	7.84	0	0.00	153	100.00
Three	22	383	405	94.40	22	5.13	2	0.47	429	100.00
Four	53	73	126	92.65	8	5.88	2	1.47	136	100.00
Five	7	1142	1149	96.31	15	1.26	29	2.43	1193	100.00
Six	12	94	106	92.99	8	7.02	0	0.00	114	100.00
Sub-total	142	1973	2115	94.76	84	3.76	33	1.48	2232	100.00

Equivalent Annual Annuity (EAA) Base Case		
	Dome Unit	Tanning Bed
Present Value (PV)	-30588.79	-20567.36
Number of Years (N)	8	5
Discount Rate (K)	14.28%	14.28%
Future Value (FV)	0	0
Annual Payment (PMT)	$6,656	$6,031

As we see in the table according to Equivalent Annual Annuity (EAA), investing in Dome Unit still is the best choice because its annual payments are higher than the Tanning Bed annual payments.

Figure 2. An excerpt from Group 2's text.

Thus, the findings indicate that capital budgeting reports employ structural condensation extensively in their tables to encode numerical data in the most economical manner by using Theme reiteration. Reiteration of lexical items is one of the aspects that leads to cohesion in the texts, in addition to being the manner in which informational content is presented in the tables. The latter aspect is analysed in light of Kress and van Leeuwen's (2006) multisemiotic framework for the analysis of visual artefacts.

The SF-MDA of informational content in the tables showed that the left-hand and right-hand spatial dimensions do not necessarily correspond with the Given-New/Ideal-Real compositions. Whereas the numerical values of PV, K, FV, and PMT in Figure 2 represented New information, the numbers of years (N), 8 and 5, were stated in the task sheet. In addition, the numerical values in the first three rows in Table 3 were drawn from the task sheet. This table, therefore, includes six instances of New information, 3 in row 4 and 3 in row 5 – the numerical values for the "Required Number of Aircraft Calculations" and for "Required Number of Aircraft Calculations (Rounded)" for Y-1, Y-2, and Y-3. This finding does not accord with Kress and van Leeuwen's (2006) interpretations of the composition of information value in visual artefacts. The positions "ideal" and "real" in the tables are determined according to the "material value" of each category. Thus, the topical Given Themes along the tables' horizontal axes are presented on the left side by categories and sub-categories, whereas the numerical value on the right side can be either Given or New, depending on whether it is known before the calculations (or not),

Table 3. An excerpt from Group 5's text.

Number of A/C required	Y-1	Y-2	Y-3
Minimum required passenger capacity per year (government regulation)	300,000	300,000	300,000
A/C passengers capacity	200	250	350
Number of flights per year	300	320	335
Required number of aircraft	5.00	3.75	2.56
Required number of aircraft (Rounded)	5	4	3

that is, whether elicited from the task sheet (Given) or calculated (New). Therefore, I argue that the Rheme in a table can be either New or Given. As a result, left-hand and right-hand spatial dimensions do not always correspond with the Given-New compositions. This finding is consistent with Jones' (2006) argument that an image or text occurring on the right side does not necessarily present New visual or verbal information. It also corresponds with the finding in Alyousef's (2015) study of the composition of information value in tertiary management-accounting texts.

There were also few instances of the dynamic linear (or "zig-zag") pattern, which is mapped textually with the simultaneous message line of Given and New (Table 3). This pattern provides a powerful resource for constructing the flow of discourse (Halliday 1993). Typically, a Theme is *backgrounded* because it refers to something that has preceded and passed, while a Rheme refers to New information that is *foregrounded* because it triggers subsequent Themes. In Table 4, we see a linear pattern by which information placed in the Rheme position is repackaged in a subsequent Theme.

The thematic complements in declarative clauses are *marked Themes* that have the potential to become subjects because they are nominals but have not been selected as subjects; nevertheless, they are thematic because they are *foregrounded* as the Theme (Halliday and Matthiessen 2014). For example, the Theme "the depreciation cost" in "For the depreciation cost" is marked because it is announced explicitly by means of the expression *for*. Marked Themes contribute to text staging by re-orienting the development of elements in a previous clause. The deictic element *which* in text 1 is thematic because it serves two functions: as a marker of some special status of the clause (i.e. textual) and as an element in the experiential structure (i.e. topical). Moreover, all six texts included textual themes and Conjunctive Adjuncts ("and", "firstly", "then", "indeed", and "nevertheless"), which were followed by topical Themes. These cohesive devices relate the message to the immediate context of the preceding clause.

> *Secondly*, **the new machine** is expected to be purchased for about 2.524 million after the adjustment for inflation. (Group 1's text)
>
> *Similarly*, **we** assume electricity costs, bulb costs to grow in line with inflation@ 3%. (Group 2's text)
>
> *Thirdly*, according to the results of cash flow, the company could make sensitivity analysis for each proposal by increasing or decreasing the percentage. (Group 3's text)
>
> *So, in order to* make NPV equal 0, **the IRR** should be 37.5%. (Group 4's text)
>
> *Hence*, **disposal of the assets** at the end of the planning horizon is appropriate. (Group 5's text)
>
> *Lastly*, **the IRR** does not depend on the yield or discount rate of the firm. (Group 6 text)

Conjunctive devices are crucial for expressing the logical relationships between clauses. For example, the conjunctives in the examples develop based on the meaning of another preceding clause in terms of time ("firstly", "secondly", "thirdly", and "lastly"), manner of comparison ("similarly"), or cause ("so" and "hence"). The findings in Table 2 show that, although there were no significant differences among the six groups in the use of Theme reiteration and the linear Theme patterns, only three groups (Groups 3–5) used the multiple-Theme pattern (Table 4). Both Group 4 and Group 5 used this pattern to create two new Themes from the information in the Rheme position. For example,

Table 4. The development of Theme/Rheme in the six texts.

Text No.	Textual Theme	Topical Theme	Rheme
One		After the derivation of cash flows	NPV is calculated and it accounted for 2,853,108
		which	are positive
	and	this	implies that proposal is creating value.
	Nevertheless,	*this figure*	should be compared to the NPV.
Two		The sensitivity analysis	is type of risk analysis.
		This analysis	shows us what will happen
		Patsy	is considering expanding her business.
		She	has two choices, a Dome Unit or a Tanning Bed.
		Both projects	can produce the same product.
		For the both tanning options,	we perform sensitivity analysis under most likely case (70% occupancy).
		For *this*	we compute the likely scenario for an increase as well as decrease in revenues to the extent of 10%.
Three	Firstly, according to	Australian labour law,	the company must pay redundancy package $ 2.5 M to Adelaide Factory's employees,
	and	*this* incremental outflow	would equal to approximately 3.8%
		If the company	sells Adelaide factory they would receive $ 4 M which equals to 6% of Adelaide annual sales contribution.
	Furthermore,	*this* scenario	still could produce cash inflow from Thailand salvage at the end year 10 with an amount of $ 1M.
		After analysing three proposals,	it shows incremental depreciation cost and salvage value (except proposal1-serenio 2) didn't put much influence on the NPV and IRR.
		For the depreciation cost,	it depends on the outlays which just relates to tax effect.
		For another factor, salvage value,	the influence on the NPV is not apparent too.
Four		IRR	prefers B to A although both projects have identical initial outlays.
		It is because Project B	get greater cash inflows than A in first year – one year after cash outlays-
Five		We are told that the Adelaide to Sydney operation	is but one of many projects within the company and any losses can be offset against gains in other projects.
		For this reason our losses	are reduced by the tax amount.
		Since we are not provided with a risk free rate in the question, we	have modified the method and adjusted all cash flows to the cost of capital (WACC).
		Doing so	has a similar effect as the original method and enables ..
		RNA	= MinRPCpy / (APC x NFpy)
		RNA	= Required Number of Aircraft (to meet regulation)
		MinRPCpy	= Minimum required passenger capacity per year (government regulation)
		NFpy	= Number of Flight per year
		APC	= Aircraft Passenger Capacity
Six		Feng S Wei	was incorrect in stating that the NPV, Payback Period and IRR necessarily yield the same ranking order for the projects.
		These three methods	do not necessarily yield the same ranking of the projects.

the Rheme in the clause "After analysing three proposals, it … " in Group 3's text (Table 4) introduced the two factors "depreciation cost" and "salvage value", which did not affect the Net Present Value (NPV) and Internal Rate of Return (IRR), each of which was made the Theme in subsequent clauses, as shown in Figure 3.

Theme   **Rheme**

Analysis of 3 proposals   2 factors

First factor

Second factor
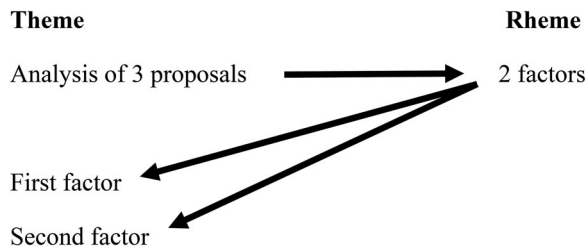
Figure 3. Multiple-theme pattern in Group 3's text.

The clause "After analysing three proposals … " is a non-finite hypotactic enhancing clause acting as a Circumstantial Adjunct. The realisation of the interpersonal Theme was extended to include grammatical metaphors in it-clauses with extraposed subjects. A grammatical metaphor includes the substitution of a grammatical class by another and is a non-congruent form of meaning. Similarly, the two Themes "project A" and "project B" in Group 4's text were created from the following Rheme in the preceding clause: "may give conflicting decisions where projects differs cash inflow … " Most of the occurrences of the multiple-Theme pattern were in Group 5's text, that is, 29 of 33 instances. The Multiple-Theme pattern is the most difficult one for academic writing students because they must develop a number of Themes that are gleaned from the information in the Rheme position. Although this pattern typically occurs at the beginning of a paragraph or a text section to mark continuity with a preceding paragraph, Group 5 used this pattern for another purpose. It used this pattern in the report to provide the

Table 5. Examples of it-clauses in the texts.

	Theme			Rheme		
	Theme		Rheme		Theme	Rheme
Text	Textual	Topical		Struct.	Topical	
One	Furthermore,	*it*	is *assumed*	that	inflation	is incorporated in those estimates.
		It	is *suggested*	that	changes in WACC and the cost of the machine	do not significantly affect NPV
		It	is *assumed*	that	the machine	will be sold for 0.2 million
Two	Consequently,	*it*	is *recommended*	that	proposal 3	to be implemented
		It	is *not clearly* stated in the description		how many (additional) worker-hours	are required for operating tanning facilities
		It	*should be noted*	that	capital budgeting results	are not the only evidence the manager has to rely on
Three	Conversely,	*it*	is *necessary*		(for you)	to consider cash outflows in proposal 3
	Finally,	*it*	*seems clear*	that	proposal 2	has a shorter time of PP
Five		*it*	is *important* to note	that	the capital gain or loss itself	is not a cash flow,
		From this *it*	is *clear*	that	none of the options	provides a benefit to the firm's value over the current operation
Six	then	*it*	would be *reasonable* to assume	that	the expected cash flows and discount rate indicated for Project B	are indicative of a typical project

underlying meanings of the symbols (or acronyms) in a mathematical equation (Table 4), thereby creating the following three Themes:

MinRPCpy	= Minimum required passenger capacity per year (government regulation);
NFpy	= Number of flights per year; and
APC	= Aircraft passenger capacity.

The use of this pattern assists readers in understanding the meaning-making processes of equations. The other five groups, however, did not include such equations in their reports as Group 5 did because all finance students were expected to upload, along with their reports, a Microsoft Excel file showing their calculations. Group 5 likely tried to ensure it distinguished itself in this assignment. The students' language proficiency level seem to facilitate their use of linear and multiple-Theme patterns (Jalilifar 2010).

The findings in the present study also revealed that all the groups, except Group 4, employed anticipatory "it" in Subject position with (*be to+*) *infinitive* to provide their opinions or recommendations of the better proposal (Table 5). Anticipatory "it" is labelled as Subject because it occurred in its position.

The words "necessary", "clear", "important", and "reasonable" in Table 5 are parts of the verbal groups and hence are in the Rheme position. The six groups used this construction to express their attitudes towards particular points (or propositions). Employing the SF-MDA, I attempted to unpack the elements and the processes (Monteiro and Ainley 2006) through which the students constructed knowledge in statistical graphs.

Graphs and financial tables can be classified as *conceptual visuals* (Kress and van Leeuwen 2006) because they depict some type of analysis or classification. Guo (2004, 201) stated that a statistical graph, unlike an image, is "an abstract theoretical entity although it may have material form"; that is, meaning is elicited from the numbers. Meaning emanates from the reasoning that this material form exhibits. As stated earlier, a sensitivity analysis is a measure focusing on analysing the effects of changes in key variables on the project's IRR or NPV. Both Group 1 and Group 3 applied their knowledge of the theoretical aspects of finance to construct statistical graphs that encompassed a complex array of elements and processes (Monteiro and Ainley 2006). By contrast, Group 2 used tables to present the findings of the sensitivity analysis in tables.

Group 1 conducted scenario analyses for an increase – as well as a decrease – in revenues up to 10% (Figure 4).

To analyse the thematic and informational choices in the sensitivity analysis graph (Figure 4), I utilised Group 1's intuitive interpretations and my reading of the course textbook (Brigham and Houston 2009). Group 1 and Group 3 used abbreviations (WACC for weighted average of capital cost and COGS for cost of goods sold) and shapes (arrows, squares, and diamonds) to label the axes of the graphs. In Group 1's graph, the NPV was based on four key variables: WACC, machinery cost, sales, and COGS. Royce (2002, 193) argued that visual semiotic systems "utilise meaning-making resources in ways that are specific to their particular mode". To interpret the sensitivity graph, the participants must understand not only the lexico-grammar of the axes but also its relationship with the intersecting axes that depict the mathematical relationship.

Theme-Rheme patterns are created between axes in statistical graphs. Inspired by O'Halloran (1996), Guo (2004) contended that statistical graphs use the coordinate
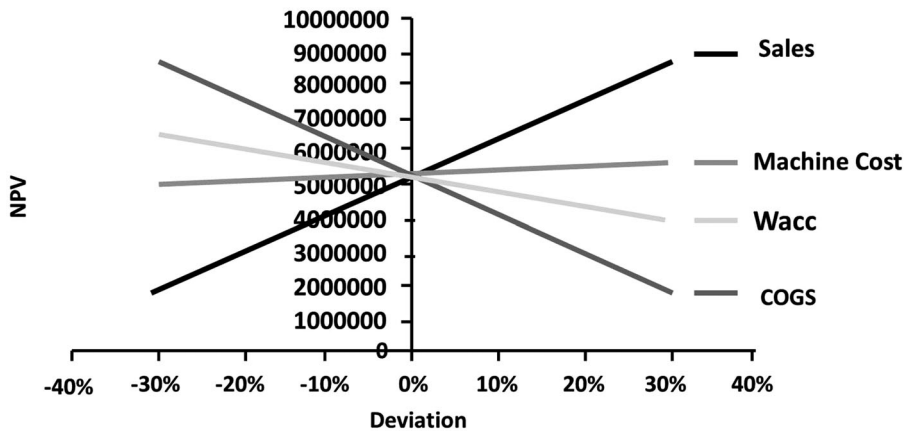
Figure 4. Sensitivity analysis graph in Group 1's text (Alyousef 2013).

system, whereas in most cases Given information (or Theme) is represented by the horizontal X-axis designating the independent variable and the vertical Y-axis designating the dependent variable, while the New (or Rheme) is found in the space circumscribed by the two axes. In terms of visual perception, the point at which the horizontal and the vertical axes intersect is perceived as salient (i.e. seen first). The intersection point is characterised as having a high degree of saliency because it appears to draw attention to itself in some way (Bateman 2011). In Figure 4, the horizontal X-axis designating the independent variable "per cent error in estimate" and the vertical Y-axis designating the dependent variable "NPV" represent the Given, whereas New is represented by the degree of steepness of each slope. As O'Halloran (1999, 27) states, visual display "creates new entities which are intuitively accessible". The slopes of the lines in the graph indicate how sensitive NPV is to changes in each input: "the larger the range, the steeper the variable's slope and the more sensitive NPV is to this variable" (Brigham and Houston 2009, 377). In other words, steep curves indicate a greater degree of sensitivity to deviations from the original estimates (Alyousef 2013). The finding that New information is represented by the degree of steepness of each slope, rather than by left-hand and right-hand spatial dimensions, contradicts the principle of the composition of "information value" developed by Kress and van Leeuwen (2006). The New information in the figure aided Group 1 in drawing conclusions by spotting the effects of changes in key variables on the project's NPV.

> Examining the sensitivity analysis outcomes, it appears that NPV is highly responsive to changes in sales and in cost of goods sold. On the other hand, it is suggested that changes in WACC and the cost of the machine do not significantly affect NPV.

This visual semiotic mode supplements the orthographic text because Group 1's interpretations were based on the graph's content. Meaning is created in visual semiotic resources not only intra-semiotically (within a single semiotic resource, the graph) but also inter-semiotically (across different semiotic resources) by means of the interaction of the graph and the accompanying linguistic text (O'Halloran 2008a). The inter-semiotic relationships between visual semiotic modes and the text accompanying them is that the latter helps in elucidating and realising highly condensed accounting numeracy.

Table 6. Thematic progression analysis of Group 1's sensitivity analysis figure.

Theme (T)			Rheme (R)	Theme Type
Topical	Interpersonal	Textual		
		When all the inputs	are set at their base-case levels,	Reiteration
		their deviations from the base	are all zero.	
and		the NPV	is $ 5,304,861.	
If		sales price	is set 30% above its expected price,	Reiteration
		the **NPV**	would be +9,000,000.	
If		WACC price	is set 30%above its expected price,	Reiteration
		the **NPV**	would be +6,500,000.	
If		machine cost price	is set 30%above its expected price,	Reiteration
		the **NPV**	would be +5,500,000.	
If		COGS price	is set 30%above its expected price,	Reiteration
		the **NPV**	would be 8,800,000.	

Returning to thematic progression, Group 1's verbal interpretation (or reading path) of the graph was analysed for thematic progression (Table 6).

The SF-MDA of the statistical graph revealed the extensive use of Theme reiteration and unmarked Themes, in addition to an instance of a marked Theme. As discussed above, marked Themes have the potential to be subjects because they are nominals but have not been selected subjects (Halliday and Matthiessen 2014). The clause "All the inputs" in Table 6 summarises the entire burden of the inputs in the graph, that is, the 30% increase and decrease in WACC, machinery cost, sales, and COGS. The 30% decrease or increase in revenues was based on participants' prediction of the external factors that might affect the business environment. Whereas the marked Theme is conflated with "When", the unmarked Theme, "the NPV", is conflated with the Subject.

Having presented and discussed the findings of the SF-MDA of the participants' management reports, I now present my conclusion and the theoretical and pedagogical implications of the findings.

Conclusion and implications

The aim of this study was to investigate and explore the representation and development of information in six finance management reports utilising capital budgeting techniques. The reports were written by 17 international postgraduate business students enrolled in a Master's of Commerce Accounting program. Employing Halliday's (1994) SFL and Kress and van Leeuwen's (2006) inter-semiotic composition of information value, I conducted an SF-MDA of the multimodal finance texts, which encompassed tables and graphs. The SF-MDA of thematic progression in the tables and the graphs revealed that management reports typically use Theme reiteration. The reiteration of a Theme in these semiotic resources serves not only to provide a strong topical focus by presenting additional information or making further explanation but also to achieve other functions, including spotting trends and making decisions by conducting comparative judgments of various statistical figures that assist in drawing conclusions. The participants used Theme reiteration to provide Given or New information and to draw conclusions. The findings also indicated that capital budgeting reports extensively employ structural condensation in their tables to encode numerical data in the most economical manner by using Theme reiteration. Meaning is created in visual semiotic

resources not only intra-semiotically (within a single semiotic resource, i.e., the graph) but also inter-semiotically (across different semiotic resources) by means of the inter-action of the graph with the accompanying linguistic text (O'Halloran 2008a). Whereas the linear Theme pattern was rarely used, the multiple-Theme pattern was minimally used by the three groups. An interesting finding was that Group 5 skilfully developed a number of Themes from acronyms (or symbols) in the equations to help readers under-stand their underlying meanings.

The analysis of informational choices in tables extends Kress and van Leeuwen's (2006) approach to the analysis of visual artefacts in terms of compositional zones. The analysis of the statistical sensitivity analysis graph showed that both the horizontal and the vertical axes stand for given information, whereas the degree of steepness of each slope rep-resents New information. Unlike orthographic texts, rhematic statuses in finance tables and graphs are contingent on the material value of the message, whether it is known before (or not).

The findings suggest that students have managed workplace practices by applying capital budgeting techniques into practice to determine which venture is worth pursuing. This practice, in turn, might affect them during and beyond university. This paper contrib-utes to our understanding of thematic progression and the composition of information value in capital budgeting reports.

A number of pedagogical and theoretical implications can be suggested as outcomes of this research study. The SF-MDA of accounting tables and graphs showed that SFL is a powerful resource for analysing meanings inscribed in these exhibits. The analysis of informational choices in the multimodal business artefacts extends Kress and van Leeu-wen's (2006) functional interpretations of visual artefacts in terms of compositional zones. Because thematic progression patterning plays a vital role in comprehending a text and in creating a naturally flowing text, it can be emphasised in the teaching and learning of writing, particularly in the teaching of English for Business Purposes (EBP). Tutors can draw students' awareness to the thematic choices available to them so that they can easily control the flow of their texts with practice. If these implications were made explicit, students' learning experiences and their understanding of the meaning-making resources might be greatly enhanced, in turn, affecting them in and beyond the university.

Finally, the study is limited to 19 students; therefore, the findings are not based on a representative sample of the discipline's academia. In other words, because the interpret-ations that I presented in this research study reflect only a subset of the full range of the writers' intentions and experiences, they are of the *moderatum* kind (Williams 2000) because they are inevitable. Therefore, they are suggestive rather than definitive because they represent instances of a more broadly recognisable set of features. As Denzin and Lincoln (2000, 14) argued, paraphrasing Guba, "reality can never be fully apprehended, only approximated". Further studies investigating the organisation of Theme and the composition of information value in tertiary finance texts should require the inclusion of a larger corpus.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

Notes on the contributor

Hesham Suleiman Alyousef is an assistant professor at the Department of English Language and Literature at King Saud University in Riyadh, Saudi Arabia. He completed his Master's degree in applied linguistics in 2007 at King Saud University. He worked as an MA thesis examiner during his Ph.D. candidature and as an academic editor for the *Asian ESP Journal*. He has published a number of papers in refereed academic journals, as well as in journals listed in Thomson's Institute for Scientific Information (ISI) database and in Elsevier's Scopus database. His research interests include systemic functional linguistics, academic literacies, metadiscourse, multimodal discourse analysis, and the use of Web 2.0 technology in higher education. He has more than 25 years of experience in teaching ESL/EFL students.

ORCID

Hesham Suleiman Alyousef 🔟 http://orcid.org/0000-0002-9280-9282

References

Alyousef, H. S. 2013. "An Investigation of Postgraduate Business Students' Multimodal Literacy and Numeracy Practices in Finance: A Multidimensional Exploration." *Social Semiotics* 23 (1): 18–46. doi:10.1080/10350330.2012.740204.

Alyousef, H. S. 2015. "A Study of Theme and Information Structure in Postgraduate Business Students' Multimodal Written Texts: A SF-MDA of Management Accounting Texts." Paper presented at the Official Conference Proceedings of the 2015 Asian Conference on Language Learning (ACLL 2015), Kobe, Japan, 302–323.

Alyousef, H. S., and S. M. Alnasser. 2015a. "A Study of Cohesion in International Postgraduate Students' Multimodal Management Accounting Texts." *Arab World English Journal (AWEJ)* 6 (3): 30–46.

Alyousef, H. S., and S. M. Alnasser. 2015b. "A Study of Cohesion in International Postgraduate Business Students' Multimodal Written Texts: An SF-MDA of a Key Topic in Finance." *The Buckingham Journal of Language and Linguistics* 8: 56–78. doi:10.5750/bjll.v1i0.1047.

Alyousef, H. S., and P. Mickan. Forthcoming. "Literacy and Numeracy Practices in Postgraduate Management Accounting." In *Multimodality in Higher Education*, edited by A. Archer and E. Breuer. Leiden: Brill Publishing.

Bargiela-Chiappini, F. 2009. *The Handbook of Business Discourse*. Edinburgh: Edinburgh University Press.

Bateman, J. A. 2011. *Multimodality and Genre: A Foundation for the Systematic Analysis of Multimodal Documents*. New York: Palgrave Macmillan.

Bhatia, V. 1993. *Analysing Genre: Language Use in Professional Settings*. London: Longman.

Biktimirov, E. N., and K. J. Klassen. 2008. "Relationship between Use of Online Support Materials and Student Performance in an Introductory Finance Course." *Journal of Education for Business* 83 (3): 153–158. doi:10.3200/JOEB.83.3.153-158.

Brigham, E., and J. Houston. 2009. *Fundamentals of Financial Management*. 12th ed. Mason, OH: South-Western Cengage Learning.

Camiciottoli, B. C. 2010. "Discourse Connectives in Genres of Financial Disclosure: Earnings Presentations vs. Earnings Releases." *Journal of Pragmatics* 42 (3): 650–663. doi:10.1016/j.pragma.2009.07.007.

Chan, K., C. Shum, and D. Wright. 1997. "Class Attendance and Student Performance in Principles of Finance." *Financial Practice and Education* 7 (2): 58–65.

Chen, J., and T. F. Lin. 2008. "Class Attendance and Exam Performance: A Randomized Experiment." *The Journal of Economic Education* 39 (3): 213–227. doi:10.3200/JECE.39.3.213-227.

Clatworthy, M., and M. J. Jones. 2001. "The Effect of Thematic Structure on the Variability of Annual Report Readability." *Accounting, Auditing & Accountability Journal* 14 (3): 311–326.

Conaway, R. N., and W. J. Wardrope. 2010. "Do Their Words Really Matter? Thematic Analysis of US and Latin American CEO Letters." *Journal of Business Communication* 47 (2): 141–168.

Daneš, F. 1974. "Functional Sentence Perspective and the Organization of the Text." In *Papers on Functional Sentence Perspective*, edited by F. Daneš, 106–128. Prague: Academic.

Davidson, R. 2005. "Analysis of the Complexity of Writing Used in Accounting Textbooks over the Past 100 Years." *Accounting Education* 14 (1): 53–74. doi:10.1080/09639280410001695241.

Denzin, N. K., and Y S. Lincoln. 2000. "The Discipline and Practice of Qualitative Research." In *Handbook of Qualitative Research, vol. 2*, edited by N. K. Denzin and Y. S. Lincoln, 1–28. Thousand Oaks, CA: Sage.

Drury, H., P. O' Carroll, and T. Langrish. 2006. "Online Approach to Teaching Report Writing in Chemical Engineering: Implementation and Evaluation." *International Journal Engineering Education* 22 (4): 858–867.

Ebrahimi, S. F., and S. J. Ebrahimi. 2012. "Information Development in EFL Students Composition Writing." *Advances in Asian Social Science* 1 (2): 212–217.

Eggins, S. 2007. *An Introduction to Systemic Functional Linguistics*. 2nd ed. London: Continuum.

Flowerdew, J. 2012. *Discourse in English Language Education*. London: Routledge.

Forey, G. 2002. "Aspects of Theme and Their Role in Workplace Texts." PhD diss., University of Glasgow.

Fries, P. 1981. "On the Status of Theme in English: Arguments from Discourse." *Forum Linguisticum* 6 (1): 1–38.

Garzone, G. 2009. "Multimodal Analysis." In *The Handbook of Business Discourse*, edited by F. Bargiela-Chiappini, 155–165. Edinburgh: Edinburgh University Press.

Grant, D., C. Hardy, C. Oswick, and L. Putnam. 2004. *The Sage Handbook of Organizational Discourse*. London: Sage.

Guo, L. 2004. "Multimodality in a Biology Textbook." In *Multimodal Discourse Analysis: Systemic-Functional Perspectives*, edited by K. O'Halloran, 196–219. London: Continuum.

Halliday, M. A. K. 1967. "Notes on Transitivity and Theme in English: Part 2." *Journal of Linguistics* 3 (2): 199–244. doi:10.1017/S0022226700016613.

Halliday, M. A. K. 1978. *Language as Social Semiotic: The Social Interpretation of Language and Meaning*. London: Edward Arnold.

Halliday, M. A. K. 1993. "On the Language of Physical Science." In *Writing Science: Literacy and Discursive Power*, edited by M. A. K. Halliday and J. R. Martin, 54–68. London: Falmer Press.

Halliday, M. A. K. 1994. *An Introduction to Functional Grammar*. London: Edward Arnold/Foreign Language Teaching & Research Press.

Halliday, M. A. K., and C. Matthiessen. 2014. *Halliday's Introduction to Functional Grammar*. 4th rev. ed. London: Routledge.

Hawes, T. 2015. "Thematic Progression in the Writing of Students and Professionals." *Ampersand* 2: 93–100. doi:10.1016/j.amper.2015.06.002.

Hsu, P. L., and W. G. Yang. 2007. "Print and Image Integration of Science Texts and Reading Comprehension: A Systemic Functional Linguistics Perspective." *International Journal of Science and Mathematics Education* 5 (4): 639–659. doi:10.1007/s10763-007-9091-x.

Hyland, K. 1998. "Exploring Corporate Rhetoric: Metadiscourse in the CEO's Letter." *Journal of Business Communication* 35 (2): 224–244. doi:10.1177/002194369803500203.

Jalilifar, A 2010. "Thematization in EFL Students' Composition Writing and Its Relation to Academic Experience." *RELC Journal* 41 (1): 31–45. doi:10.1177/0033688210362621.

Jones, J. 2006. "Multiliteracies for Academic Purposes: A Metafunctional Exploration of Intersemiosis and Multimodality in University Textbook and Computer-Based Learning Resources in Science." EdD thesis, University of Sydney.

Kress, G., and T. van Leeuwen. 2006. *Reading Images: The Grammar of Visual Design*. London: Routledge.

Lea, M., and B. Street. 2006. "The 'Academic Literacies' Model: Theory and Applications." *Theory into Practice* 45 (4): 368–377. doi:10.1207/s15430421tip4504_11.

Martinec, R. 1998. "Cohesion in Action." *Semiotica* 120 (1–2): 161–180. doi:10.1515/semi.1998.120.1-2.161.

Martinec, R., and A. Salway. 2005. "A System for Image–Text Relations in New (and Old) Media." *Visual Communication* 4 (3): 337–371.

Medve, V.B., and V. P. Takac. 2013. "The Influence of Cohesion and Coherence on Text Quality: A Cross-Linguistic Study of Foreign Language Learners' Written Production." In *Language in Cognition and Affect*, edited by E. Piechurska-Kuciel and E. Szymanksa-Czaplak, 111–131. Berlin: Springer.

Mellos, V. D. 2011. "Coherence in English as a second Language Undergraduate Writing: A Theme-Rheme Analysis." MA thesis, San Diego State University.

Monteiro, C., and J. Ainley. 2006. "Student Teachers Interpreting Media Graphs." Paper presented at Proceedings of the Seventh International Conference on Teaching Statistics, Bahia, Brazil, July 2–7.

North, S. 2005. "Disciplinary Variation in the Use of Theme in Undergraduate Essays." *Applied Linguistics* 26 (3): 431–452. doi:10.1093/applin/ami023.

O'Halloran, K. 1996. "The Discourses of Secondary School Mathematics." PhD thesis, Murdoch University.

O'Halloran, K. 1999. "Towards a Systemic Functional Analysis of Multisemiotic Mathematics Texts." *Semiotica* 124 (1/2): 1–30. doi:10.1515/semi.1999.124.1-2.1.

O'Halloran, K. 2000. "Classroom Discourse in Mathematics: A Multisemiotic Analysis." *Linguistics and Education* 10 (3): 359–388. doi:10.1016/S0898-5898(99)00013-3.

O'Halloran, K. 2005. *Mathematical Discourse: Language, Symbolism and Visual Images*. London: Continuum.

O'Halloran, K. 2008a. "Mathematical and Scientific Forms of Knowledge: A Systemic Functional Multimodal Grammatical Approach." In *Language, Knowledge and Pedagogy: Functional Linguistic and Sociological Perspectives*, edited by F. Christie and J. R. Martin, 205–236. London: Continuum.

O'Halloran, K. 2008b. "Systemic Functional-Multimodal Discourse Analysis (SF-MDA): Constructing Ideational Meaning Using Language and Visual Imagery." *Visual Communication* 7 (4): 443–475. doi:10.1177/1470357208096210.

O'Halloran, K. 2009. "Systemic Functional Multimodal Discourse Analysis (SF-MDA) Approach to Mathematics, Grammar and Literacy." In *Advances in Language and Education*, edited by A. McCabe, M. O'Donnell, and R. Whittaker, 77–102. London: Continuum.

O'Halloran, K. 2011. "Multimodal Discourse Analysis." In *Continuum Companion to Discourse Analysis*, edited by K. Hyland and B. Paltridge, 120–137. London: Continuum.

Okawa, T. 2008. "Academic Literacies in the Discipline of Nursing: Grammar as a Resource for Producing Texts." MA thesis, University of Adelaide.

O'Toole, M. 1994. *The Language of Displayed Art*. London: Leicester University Press.

Royce, T. 2002. "Multimodality in the TESOL Classroom: Exploring Visual-Verbal Synergy." *TESOL Quarterly* 36 (2): 191–205. doi:10.2307/3588330.

Rutherford, B. A. 2005. "Genre Analysis of Corporate Annual Report Narratives: A Corpus Linguistic-based Approach." *International Journal of Business Communication* 42 (4): 349–378. doi:10.1177/0021943605279244.

Sen, S., P. Joyce, K. Farrell, and J. Toutant. 1997. "Performance in Principles of Finance Courses by Students with Different Specializations." *Financial Practice and Education* 7 (2): 66–73.

Thomas, J. 1997. "Discourse in the Marketplace: The Making of Meaning in Annual Reports." *Journal of Business Communication* 34 (1): 47–66. doi:10.1177/002194369703400103.

Van Leeuwen, T. 2005a. *Introducing Social Semiotics*. London: Routledge.

Van Leeuwen, T. 2005b. "Multimodality, Genre and Design." In *Discourse in Action: Introducing Mediated Discourse Analysis*, edited by S. Norris and R. Jones, 73–94. London: Routledge.

Wake, B. 2006. "Dialogic Learning in Tutorial Talk: A Case Study of Semiotic Mediation as a Learning Resource for Second Language International Students." PhD thesis, University of Adelaide.

Westwood, R., and S. Linstead. 2001. *The Language of Organization*. London: Sage.

Williams, M. 2000. "Interpretivism and Generalisation." *Sociology* 34 (2): 209–224. doi:10.1177/S0038038500000146.