

University of Wollongong

Research Online

Faculty of Law, Humanities and the Arts -
Papers (Archive)

Faculty of Arts, Social Sciences & Humanities

1-1-2017

Circumstantiation: taking a broader look at circumstantial meanings

Shoshana J. Dreyfus

University of Sydney, shooshi@uow.edu.au

Isabelle Bennett

University of Sydney

Follow this and additional works at: <https://ro.uow.edu.au/lhapapers>



Part of the [Arts and Humanities Commons](#), and the [Law Commons](#)

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

Circumstantiation: taking a broader look at circumstantial meanings

Abstract

This paper argues for a view of circumstantial meaning as a region of ideational meaning that is instantiated across a range of lexicogrammatical structures: from the rank of the clausal constituent of circumstance in both directions: up to clause rank and down to below or within constituent rank (eg as Qualifier). This paper brings together and extends the work of Halliday & Matthiessen (An Introduction to Functional Grammar, 2004) on expansion and circumstantiation, and the work of Martin (English Text: System and Structure, 1992) within the discourse semantic system of ideation. Each type of circumstantial meaning is defined structurally, that is, according to rank, and semantically, according to type. Analysis of circumstantial meanings is conducted on a small corpus of four introductions to journal articles in order to demonstrate the use of viewing circumstantial meaning in this way.

Keywords

circumstantiation:, circumstantial, taking, meanings, broader, look

Disciplines

Arts and Humanities | Law

Publication Details

Dreyfus, S. & Bennett, I. (2017). Circumstantiation: taking a broader look at circumstantial meanings. *Functional Linguistics*, 4 5-1-5-31.

RESEARCH

Open Access



Circumstantiation: taking a broader look at circumstantial meanings

Shoshana Dreyfus*  and Isabelle Bennett

* Correspondence:
shooshi.dreyfus@sydney.edu.au
University of Sydney, Sydney,
Australia

Abstract

This paper argues for a view of circumstantial meaning as a region of ideational meaning that is instantiated across a range of lexicogrammatical structures: from the rank of the clausal constituent of circumstance in both directions: up to clause rank and down to below or within constituent rank (eg as Qualifier). This paper brings together and extends the work of Halliday & Matthiessen (An Introduction to Functional Grammar, 2004) on expansion and circumstantiation, and the work of Martin (English Text: System and Structure, 1992) within the discourse semantic system of IDEATION. Each type of circumstantial meaning is defined structurally, that is, according to rank, and semantically, according to type. Analysis of circumstantial meanings is conducted on a small corpus of four introductions to journal articles in order to demonstrate the use of viewing circumstantial meaning in this way.

Keywords: Systemic functional linguistics, Ideational meaning, Circumstantiation, Research articles, Circumstances

Introduction

What do the following **bolded** instances have in common?

- A) I was really hungry//**when I ate dinner**
- B) My birthday is **tomorrow**
- C) The letter is **on the mantelpiece**
- D) I **sped** home as fast as I could
- E) It's really hot **in here**
- F) The book **on the table** belongs to me
- G) A marked gap exists in the literature on oral communication skills **in the accountancy workplace**

Their commonality lies in their ideational meaning more than in their lexicogrammatical structure. Regarding ideational meaning, all these examples contain some kind of circumstantial meaning - meaning which contextualises the events construed in the clause according to such dimensions as time, place and manner (Halliday and Matthiessen 2004). The bolded clause **when I ate dinner** in (A) is a hypotactic dependent clause, however its meaning contextualises the activity of feeling hungry with location in time. Indeed, novice TRANSITIVITY analysts often mistake these temporal dependent clauses as the constituent of circumstance.

The second example is an identifying clause in which **tomorrow** is the participant Token, which contextualises the Value, My birthday, with location in time.

My birthday	is	tomorrow
Value	Process: identifying	Token

The letter is **on the mantelpiece** in (C) is an attributive clause with a Circumstance, **on the mantelpiece**, functioning as the Attribute. It contextualises the Carrier, the letter, with Location in space/place.

The letter	is	on the mantelpiece
Carrier	Process: attributive	Attribute: Circumstance

In (D), the process **sped** is infused with Manner, and means moved quickly (Macquarie Dictionary, accessed 14/11/15).

In (E), **in here** is the constituent circumstance of the Location place type, contextualising the description of heat in terms of where it is hot.

It	's	really hot	in here
Carrier	Process: attributive	Attribute	Circumstance: location place

In (F), while **on the table** is a Qualifier, it nevertheless contextualises the Thing (book) by specifying which book, in terms of spatial location. Students learning transitivity analysis also confuse these types of Qualifiers with circumstances.

The	book	on the table	belongs	to me
Actor (nominal group)			Process: material	Scope
Deictic	Thing	Qualifier		

Finally, in (G), A marked gap exists in the literature on oral communication skills **in the accountancy workplace**, the bolded part, **in the accountancy workplace**, is a Qualifier within a Qualifier within a Circumstance of Location:

a marked gap	exists	in the literature [on oral communication skills [in the accountancy workplace]].		
Existent	Process: existential	Circumstance (Location: place) prep + nominal group		
		D	Thing	Qualifier (Matter)
		on oral communication skills [in the accountancy workplace]. prep + nominal group		
		Classifier x ²	Thing	Qualifier (Loc: place)
			in the accountancy workplace. prep + nominal group	
			D	Classifier Thing

As (G) shows, the circumstance ‘in the literature on oral communication skills in the accountancy workplace’ is constituted by a prepositional phrase, with the preposition ‘in’ plus the nominal group ‘the literature on oral communication skills in the accountancy workplace’. Within that nominal group there is the Qualifier ‘on oral communication skills in the accountancy workplace’, which in turn, is constituted by another prepositional phrase with the preposition ‘on’ followed by the nominal group ‘oral communication skills in the accountancy workplace’. This nominal group, in turn, has the Qualifier ‘in the accountancy workplace’. The full circumstance ‘in the literature on oral communication skills in the accountancy workplace’ obviously construes circumstantial meaning, providing the location of the “gap” in the research, but within that circumstance, both Qualifiers, ‘on oral communication skills’ and ‘in the accountancy workplace’, provide further circumstantial meaning by way of Matter (what the literature is about: oral communication skills) and Location: place (where the oral communication skills are located: in the accountancy workplace) respectively.

Each of these seven examples contains circumstantial meaning, though only one example, (E), instantiates that meaning as the TRANSITIVITY constituent of circumstance. From a lexicogrammatical perspective, circumstances are described as augmenting the process (Halliday and Matthiessen 2004), and are also discussed alongside clause complex relations under expansion (p594). However, Halliday and Matthiessen do state that circumstantial meaning can map onto other constituents - onto processes, as processes infused with manner as per (D) (I **sped** home as fast as I could), and onto participants, for example the Attribute: circumstance, as per (C) (The letter is **on the mantelpiece**). Looking upwards to the clause, Halliday and Matthiessen also acknowledge that circumstantial meaning can be encoded into clauses of the hypotactic enhancement type, as per (A) (I was really hungry//**when I ate dinner**), which, as stated, enhances the meaning in the first clause through location in time. Halliday (1985 p137–144) also includes in the logicosemantic relation of enhancement the other circumstantial categories of Extent, Manner, Cause and Matter, arguing that circumstance types are agnate (similar in meaning) to logicosemantic relations in clause complexing. Halliday and Matthiessen (2004, p367) provide the following examples to demonstrate this feature:

Each day, she prayed **with all her heart** (Manner: means)

which is agnate to:

Each day, she prayed//**using all her heart**.

Because meanings at the stratum of discourse semantics are realised in “lexicogrammatically diverse” ways, (Martin and White 2005: 130), Martin (1992: 316–317) extends the reach of circumstantial meanings to include Qualifiers. Specifically, he shows that prepositional realisations of circumstantial meanings can occur as circumstances (Ben ran **with considerable speed**), as manner adverbs (Ben ran **quickly**) and as Qualifiers in nominal groups (the race **through the galaxy**).

Martin (1992) began to look at circumstantial meanings from a discourse semantic perspective with his preliminary work on ‘setting’, however this term refers to mainly locational circumstantial meanings. In this paper we take circumstantial meanings further, building on these earlier articulations of the diverse realisations of circumstantial meanings. We examine the lexicogrammatical diversity of circumstantial meanings, that is, those meanings that occur in a multiplicity of locations, from clause to constituent to partial constituent, such as within a process or as a Qualifier or even a Qualifier

within a Qualifier, across a small corpus. That is to say, we are separating out the type of circumstantial meaning from the type of lexicogrammatical structure that realises that meaning. In doing so, we can easily explain to students how and why the same kind of meaning is not realised and thus not analysed in the same way. For example, the four following clauses realise temporal meanings in four different lexicogrammatical structures:

1. **When it was that hot Friday** I went to uni (hypotactic enhancing clause)
2. I went to uni **on that hot Friday** (circumstance)
3. Going to uni **on that hot Friday** was a bad idea (downranked circumstance)
4. Lunchtimes **on Friday** are always busy in this cafe (Qualifier)

Having an understanding that these are all circumstantial meanings of the temporal type but that only one of them is realised as a ranking circumstance is useful not only for examining ideational meanings in texts but also for pedagogic purposes. One can show students how different circumstantial meanings, in this case temporal ones, can have a variety of lexicogrammatical realisations. As for its usefulness in the analysis of ideational meaning in texts, if we do not examine circumstantial meanings as realised across different lexicogrammatical structures, we miss at least 50% of those meanings, as is shown in the different structural realisations of circumstantial meanings across the corpus of four journal article introductions section of this paper. Finally, if we examine circumstantial meanings as they unfold logogenetically across texts, we can say something more comprehensive about the way texts realise the register variable of field.

Working as both teachers and researchers within the systemic functional linguistic model of language, it has been problematic that all these diverse realisations of circumstantial meanings have never been looked at together. Looking at them together enables a different view of ideational meaning, affording a better understanding of the extent of these meanings in texts and a more effective way of teaching about these meanings to students. As pointed out above, novice analysts are often at a loss to distinguish hypotactic enhancing clauses and Qualifiers from circumstances. This work provides a framework for doing so.

We thus explore circumstantial meanings across a range of lexicogrammatical structures before examining their presence in a small corpus of four introductions to published journal articles in two different fields: inorganic chemistry and history, as a small exploration of two instances of writing from two very different fields of knowledge. Inorganic chemistry is from the hard sciences (vertical knowledge structure in Bernstein's 1999 terms), while history is from the humanities (horizontal knowledge structure in Bernstein's 1999 terms). As we know that these disciplines have different discourse practices (see for example Martin 2007; Martin et al. 2010), it is useful to look at the way two contrasting subfields of these disciplinary knowledges realise circumstantial meanings.

Circumstantial structure, circumstantial meanings

There are two typological aspects to circumstantial meaning we explore here: structural type and semantic type. Structural type refers to the ideational structure through which the circumstantial meaning is realised. This is primarily explored from the perspective of TRANSITIVITY at the stratum of lexicogrammar. Semantic type refers to the semantic

category of the circumstantial meaning, for example, Location: place, Location: time, Manner, and is based on Halliday and Matthiessen (2004) classification of types of circumstance and logicosemantic relations. Thus the seven circumstantial meanings introduced at the commencement of this paper can be understood as follows (in Table 1), starting from the highest rank of clause within the lexicogrammar and moving down to the smallest or lowest: Qualifier within Qualifier:

Table 1 Circumstantial meanings by ideational structure and semantic type

	Type of structure at lexicogrammatical stratum	Circumstantial meaning
1. I was really hungry// when I ate dinner	clause (hypotactic enhancing)	Location: time
2. My birthday is tomorrow	Participant (Token)	Location: time
3. The letter is on the mantelpiece	Participant (Attribute: Circumstance)	Location: place
4. It's really hot in here	Circumstance	Location: place
5. I sped home as fast as I could	Process	Manner: quality
6. The book on the table belongs to me	Qualifier	Location: place
7. A marked gap exists in the literature (1) on oral communication skills (2) in the accountancy workplace	Qualifier within Qualifier	1. Matter 2. Location: place

The next section introduces the data and then follows with a review of each circumstantial meaning by examining which semantic types occur with each lexicogrammatical structure, and which types appear in our corpus.

Data

The data for this research comprises the introduction sections to four published research articles from two different disciplines: history and inorganic chemistry. Introductions to journal articles were chosen as the researchers teach academic literacy to postgraduate international students, who often struggle with research writing. These sections of articles are crucial in arguing for a writer's research space or 'gap' (Hood 2010; Swales and Feak 2012), something postgraduate research students in particular need to master. Understanding how arguments are made in these sections of journal articles is crucial to being able to teach students how to meet this rhetorical challenge. The four introductions range in length from 33 to 82 clauses and are introduced in Table 2:

Table 2 Data set and number of clauses

Discipline	Data set	Number of ranking clauses
Chemistry	Brooks et al. (2013)	59
	Kennedy et al. (2013)	32
History	Bowen (2010)	31
	Patrick (2011)	54
	TOTAL	176

Types of circumstantial meaning

We begin with Halliday and Matthiessen (2004) semantic types of the constituent of circumstance, as these cover the range of circumstantial meanings we are

attempting to map. Halliday and Matthiessen (2004: 262–263) provide a list of nine general semantic types of circumstance (see Table 3). These are: Extent, Location, Manner, Cause, Contingency, Accompaniment, Role, Matter and Angle. All except Matter have subtypes. The first six of these (Extent, Location, Manner, Cause, Contingency, Accompaniment) are of the enhancing type of expansion. Table 3 shows these 21 circumstance types and their probe questions:

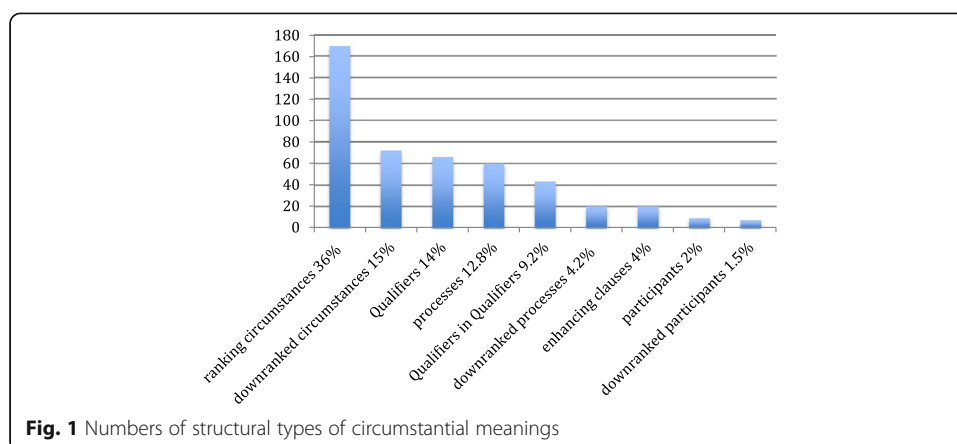
Table 3 Semantic and logicosemantic types of circumstance (after Halliday and Matthiessen 2004: 262–263)

Logicosemantic type	Semantic type	Semantic subtype	Probe question
Enhancing	Extent	distance	how far?
		duration	how long?
		frequency	how often?
	Location	place	where?
		time	when?
	Manner	means	how?
		quality	how?
		comparison	how? what like?
		degree	how much?
	Cause	reason	why?
		purpose	what for?
		behalf	who for?
Extending	Accompaniment	Contingency	condition
			why?
			default
			concession
Elaborating	Role	comitative	who or what with?
		additive	who or what else?
Projecting	Matter	guise	what as?
		product	what into?
			what about?
	Angle		according to whom?

In our corpus, we found most of these types of meaning instantiated across a range of structures including circumstances, Qualifiers, processes, participants, enhancing clauses, at both ranking and downranked locations. The next section explores the semantic types of circumstantial meanings across different structural realisations in our corpus, aiming to show that by viewing texts with this broader gaze on circumstantial meaning, we can make visible more of how these texts make meaning.

Different structural realisations of circumstantial meanings across the corpus of four journal article introductions

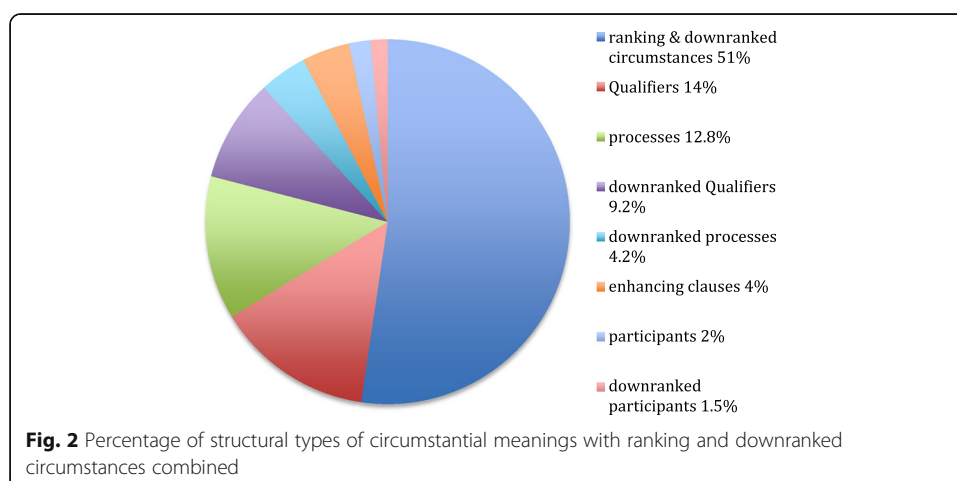
This section begins with an examination of the number of the circumstantial meanings in the corpus that are instantiated as circumstances before moving onto examining other lexicogrammatical realisations of circumstantial meanings in individual texts. In the whole corpus, there are a total of 463 circumstantial meanings, with ranking circumstances accounting for 36%. Figure 1 shows the number of different circumstantial meaning structures across the corpus.

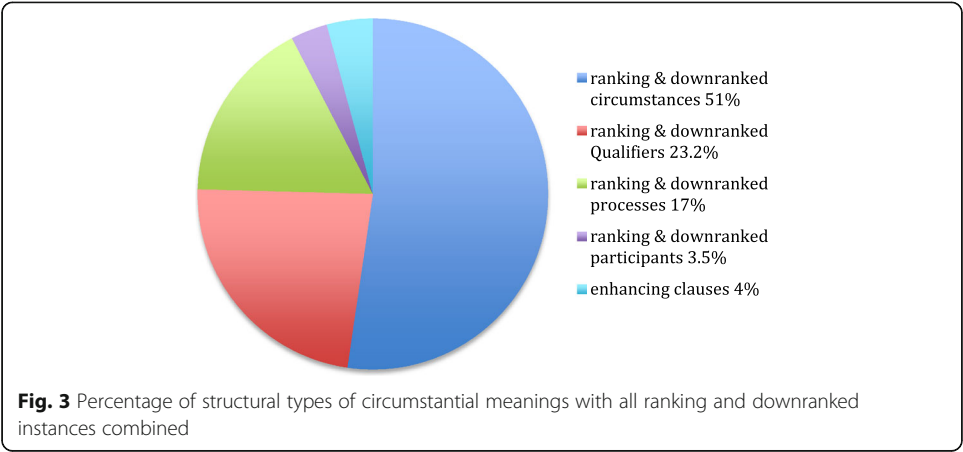


However, as Figure 2 below shows, while ranking circumstances are the most frequent way to instantiate circumstantial meaning, accounting for just over a third of the instantiations, if we add the 72 downranked circumstances (that is, those in embedded clauses), the percentage of circumstantial meaning that is instantiated as circumstance increases to 51% (247 instances).

Thus, while just over half the circumstantial meanings are realised as circumstances, both ranking and downranked, there are an additional 225 circumstantial meanings (49%) realised by a combination of other lexicogrammatical structures. We can combine the ranking and downranked instances of other structures as well, as per Figure 3.

Figure 3 shows that when we combine the ranking and downranked instances of all the different structural realisations, Qualifiers are the second most frequent (23%), followed by processes (17% - all of which instantiate Manner), with enhancing clauses and participants being the fewest. In other words, when looking at all circumstantial meanings in these texts, circumstance is still the most frequent, accounting for 51% of all circumstantial meaning. Qualifier is the next most frequent, accounting for 23.2% of all circumstantial meaning. As the third most frequent, processes account for 17% of circumstantial meaning. Downranked participants account for just 3.5%, while enhancing clauses account for 4% of all circumstantial meanings. Given this spread of





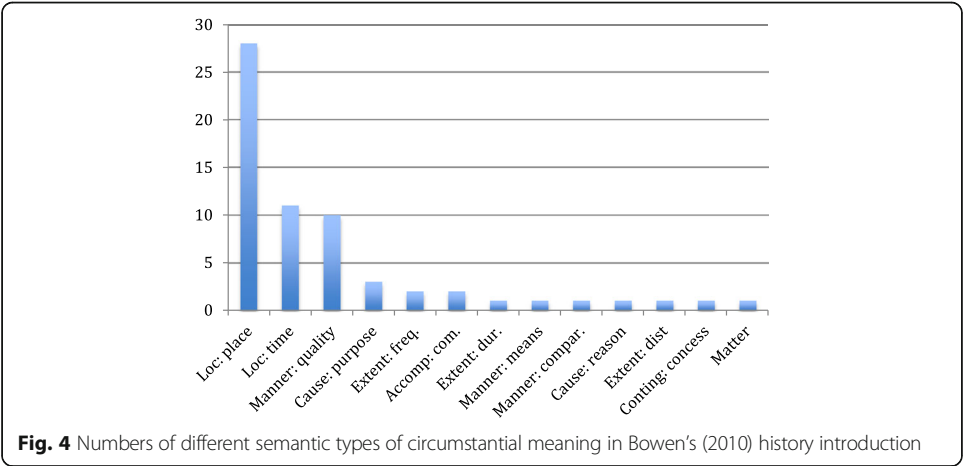
circumstantial meaning across structures, it makes sense to look at them more closely. In order to do this, we now look at the four article introductions individually.

Circumstantial meanings in the first of the two history article introductions

We begin with one of the history articles, Bowen (2010), which is an overview of the Chinese fish curing trade in colonial Australia. We examine the spread of circumstantial meanings across both structure and semantic type, to see which semantic types are realised by which structures, and the ways these meanings function in the text.

Bowen has 64 instances of circumstantial meaning, spread across 13 different semantic types. Location: place is by far the most frequent (28 instances or 43.75%), Location: time is the second most frequent (11 instances or 17%) and Manner: quality is the third most frequent with ten instances (15.6%). Numbers of all semantic types can be seen in Fig. 4 below.

It is not surprising that the most frequent types of circumstantial meaning in Bowen are Location: place and time, as we know that history discourse foregrounds both place and time in its endeavour to account for where and when historical events take place (Coffin 2006). We now explore these two most common types of circumstantial



meaning in more detail, beginning with temporal resources, and examining both the semantic and structural realisation aspects.

Most of the temporal resources in Bowen’s introduction are instantiated as ranking circumstances, with five in Theme position. Placing temporal meanings at the front of the clause is one of the ways that history discourse foregrounds time (Coffin 2006), and in Bowen, it is the temporal aspect of tracing the Chinese fishing industry in Australia that is being foregrounded. Examples include more densely packed phrases such as:

	At a time [[when most Melbourne and Sydney based European fishermen were earning approximately £50 per year]]	Chinese people [[working in Australia]]	were earning	that much	every day.
structure	Circumstance	Actor	Process	Scope	Circumstance
semantic type	Location: time		material		Extent: frequency
	Marked topical Theme				

or, more typically, a simple date:

	In 1880,	an estimated \$229,858 (US) worth of Chinese cured fish	was exported	from San Francisco to Hong Kong ⁷ .
structure	Circumstance	Goal	Process	Circumstance
semantic type	Location: time		material	Location: Place
	Marked topical Theme			

All the temporal meanings in Bowen and the way they are instantiated are displayed in Table 4 below.

As Table 4 shows, almost all the temporal meanings occur as ranking circumstances, (five of them in topical Theme position), further demonstrating the foregrounding of time as point of departure in history. However, as the field of Bowen’s history article focuses heavily on the spatial location of the fishing industry, spatial meanings are significantly more prevalent than temporal ones, and in particular, many of these spatial meanings (14/26 or 53.8%) are concrete. Using Dreyfus and Jones (2011) typology of spatial location, Bowen’s spatial locations are mapped in Table 5 below.


Table 5 shows that of these spatial meanings, geographical are the most common, focusing on where the fishing took place. However general physical, institutional occupational and historical locations also feature. As to be expected in an academic history paper, abstract places that involve semiotic locations such as ‘in Australia’s written histories and scholarly works’, and historical locations that package time (see Martin et al. 2010), such as ‘to the mid-nineteenth century gold rushes’, are present. Additionally, some of these combine both spatial and temporal meaning in the one instance, such as ‘to the mid-nineteenth century gold rushes’ or ‘from Australia’s colonial fishing industry’. These reflect the way abstraction enables the packaging of multiple meanings into one functional unit. As these

Table 4 Temporal meanings in Bowen (2010)

CI	Clauses	Circumstance	Downranked circumstance	Qualifier	Downranked Qualifier
1	The arrival of some 35,000 Chinese gold miners to Victoria during the 1850s increased demand for fish, a Chinese dietary staple.	during the 1850s			
3	In each of these regions fishing has historically played a major economic role.	historically ^a			
4	Many of these Chinese migrants probably already had commercial fishing experience.	already			
6	At a time when most Melbourne and Sydney based European fishermen were earning approximately £50 per year Chinese people working in Australia were earning that much every day.	At a time [[when most Melbourne and Sydney based European fishermen were earning approximately £50 per year]]			
7.1	During the 1860s, one Chinese fish dealer, and there were many, earned over ten times more from fish sales annually than both Melbourne's and Sydney's European fish markets combined.	During the 1860s			
10.1	For approximately 20 years from the early 1850s Chinese people in the US caught and cured whatever fish came into their nets.	For approximately 20 years from the early 1850s			
11.1	By the 1870s, specialized catching and curing camps were established	By the 1870s			
13	In 1880, an estimated \$229,858 (US) worth of Chinese cured fish was exported from San Francisco to Hong Kong.	In 1880			
14.3	This was a substantial amount especially considering that the retail value of all fresh fish sold in the San Francisco markets during 1877 was only US\$220,000.		during 1887		
16.2	Archival and archeological evidence from America's Chinese fishing history correlates with recent research from Australia to suggest material connection that provide an important basis for studying Chinese migrations during the 19 th century.				during the 19 th century

^ahistorically is understood to mean "in the past" in this context

Table 5 Types of spatial location in Bowen (2010)

	Type general	Type specific	Example	Clauses	
<div></div>	Concrete	general	into their nets in bags in casks	For approximately 20 years from the early 1850s Chinese people in the US caught and cured whatever fish came into their nets . Only a small quantity of Chinese cured fish was consumed in the US, the majority going to market in China in both dry state in bags and having been picked in casks .	
	Physical	locational	to market	Only a small quantity of Chinese cured fish was consumed in the US, the majority going to market in China in both dry state in bags and having been picked in casks	
		geographical	from the provinces of Guangdong and Fujian and the island of Amoy In each of these regions in Australia in the United States of America (US) in the U.S. x 3 in China from Australia	The majority of these migrants were impoverished lower class men from the provinces of Guangdong and Fujian and the island of Amoy . In each of these regions fishing has historically played a major economic role. At a time when most Melbourne and Sydney based European fishermen were earning approximately £50 per year Chinese people working in Australia were earning that much every day. Chinese participation in Australia's early commercial fishing industry has not received the same attention as that in the United States of America (US) . Only a small quantity of Chinese cured fish was consumed in the US, the majority going to market in China ...	
		semiotic	in Australia's written histories and scholarly works	It uses primary documents and field research to supplement the limited discussion in Australia's written histories and scholarly works .	
	institutional	occupational	in Australia's early commercial fishing industry in labour-intensive work areas such as market gardening and fishing from Australia's colonial fishing industry	Chinese participation in Australia's early commercial fishing industry has not received the same attention as that in the United States of America (US). As will be shown, the Australian example mirrors the situation in the US where Chinese immigrants to the mid-nineteenth century gold rushes took up niche economic positions in labour-intensive work areas such as market gardening and fishing .	
	Abstract		historical	to the mid-nineteenth century gold rushes from America's Chinese fishing history, in colonial Australia x 2	As will be shown, the Australian example mirrors the situation in the US where Chinese immigrants to the mid-nineteenth century gold rushes took up niche economic positions in labour-intensive work areas such as market gardening and fishing. Archival and archeological evidence from America's Chinese fishing history correlates with recent research from Australia This article offers an overview of Chinese fish-curing operations in colonial Australia .

instances package a past time into a place, they are called historical locations (Bennett unpublished).

In contrast to the temporal meanings in Bowen, spatial meanings are realised more evenly across a range of structural locations, as per Table 6.

As Table 6 shows, of the spatial meanings in Bowen, eight are instantiated as ranking circumstances, seven as downranked circumstances, nine as Qualifiers, and two as downranked Qualifiers. Thus, similar to the overall ratio of circumstantial meanings instantiated as ranking circumstances across the whole corpus (36%), ranking circumstances in Bowen account for 30.7% of all the spatial meanings, as can be seen in Figure 5.

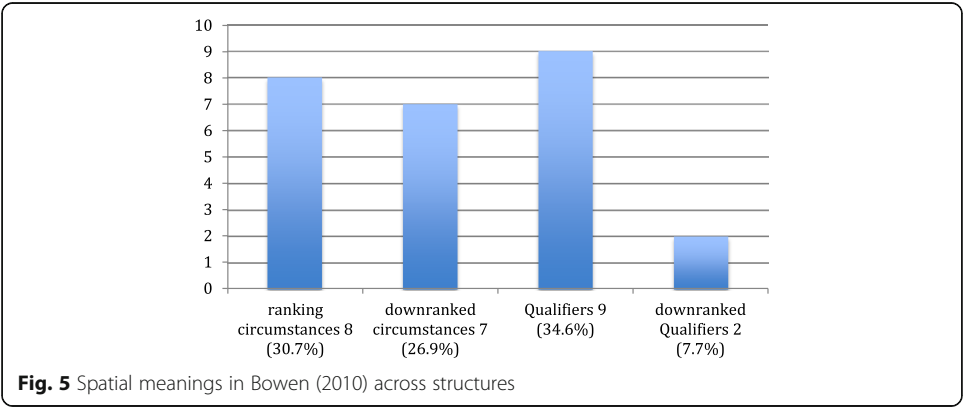
Figure 5 shows that while spatial meanings are almost evenly spaced across Qualifiers, circumstances and downranked circumstances, it is Qualifiers that are the most frequent choice for spatial meanings. This configuration confirms what we know

Table 6 Spatial meanings in Bowen (2010)

CI	Clauses	Circumstance	Downranked circumstance	Qualifier	Downranked Qualifier
1	The arrival of some 35,000 Chinese gold miners to Victoria during the 1850s increased demand for fish, a Chinese dietary staple.			to Victoria	
2	The majority of these migrants were impoverished lower class men from the provinces of Guangdong and Fujian and the island of Amoy .		from the provinces of Guangdong and Fujian and the island of Amoy		
3	In each of these regions fishing has historically played a major economic role.	In each of these regions			
6	At a time when most Melbourne and Sydney based European fishermen were earning approximately £50 per year Chinese people working in Australia were earning that much every day.		in Australia		
8	Chinese participation in Australia's early commercial fishing industry has not received the same attention as that in the United States of America (US) .		in the United States of America (US)	in Australia's early commercial fishing industry	
9.2	As will be shown, the Australian example mirrors the situation in the US			in the U.S.	
9.3	where Chinese immigrants to the mid-nineteenth century gold rushes took up niche economic positions in labour-intensive work areas such as market gardening and fishing .	in labour-intensive work areas [such as market gardening and fishing]	to the mid-nineteenth century gold rushes		
10.1	For approximately 20 years from the early 1850s Chinese people in the US caught			in the US	
10.2	and cured whatever fish came into their nets .		into their nets		
12.1	Only a small quantity of Chinese cured fish was consumed in the US ,	in the US			
12.2	the majority going to market in China in both a dry state in bags and having been pickled in casks	to market	in China	in bags	in casks
13	In 1880, an estimated \$229,858 (US) worth of Chinese cured fish was exported from San Francisco to Hong Kong .	from San Francisco to Hong Kong			
14.3	...that the retail value of all fresh fish <i>[[that were]</i> sold		in the San Francisco fish markets		

Table 6 Spatial meanings in Bowen (2010) (Continued)

	in the San Francisco fish markets during 1877 was only US\$220,000.				
15.1	As in Australia , there are documented complaints in the US about the methods the Chinese used to catch fish	in Australia, in the US			
16.1	Archival and archeological evidence from America's Chinese fishing history correlates with recent research from Australia		from America's Chinese fishing history, from Australia		
17	This article offers an overview of Chinese fish-curing operations in colonial Australia.		in colonial Australia		
18.2	It uses primary documents and field research to supplement the limited discussion in Australia's written histories and scholarly works.		in Australia's written histories and scholarly works		
19	The likely internal structure of Chinese fish-curing establishments such as ownership, management arrangements and labour requirements is examined along with a range of questions concerning the activities of Chinese fish curers in colonial Australia.			in colonial Australia	
20.2	...that Chinese people generated far greater wealth from Australia's colonial fishing industry...	from Australia's colonial fishing industry			
Total		8	7	9	2



about academic discourse in general; that it packs meaning into nominal groups (Halliday and Martin 1993). These nine spatial Qualifiers and the nominal groups they occur in are listed below:

The arrival of some 35,000 Chinese gold miners to Victoria¹

Chinese participation in Australia's early commercial fishing industry

the situation in the US

Chinese people **in the US**

in both a dry state **in bags**

Archival and archeological evidence **from America's Chinese fishing history**

with recent research **from Australia**

an overview of Chinese fish-curing operations **in colonial Australia**

the limited discussion **in Australia's written histories and scholarly works**

If downranked Qualifiers that instantiate spatial meaning are added to the number of ranking Qualifiers, this figure increases to 42.3% (11/26 instances), nearly half the number of spatial meanings. Further, if downranked circumstances instantiating spatial meanings are added to the number of ranking circumstances, this figure increases to 15/26 (57.7%) spatial meanings. Thus, just over half the spatial meanings are instantiated as circumstances and just under half as Qualifiers, at both ranking and downranked locations, as per Figure 6.

This point alone demonstrates the value of examining circumstantial meanings across a range of lexicogrammatical realisations if we want to be able to see the extent of spatial meaning in history discourse, and understand how the field of history is realised in text. Without these Qualifiers, nearly half the spatial meanings would be missed.

The third most frequent circumstantial meaning in Bowen is Manner: quality, with ten instances, of which eight are processes. This perhaps reflects the way sources are used in history discourse to keep the dialogic space open (Hood 2010) (Table 7).

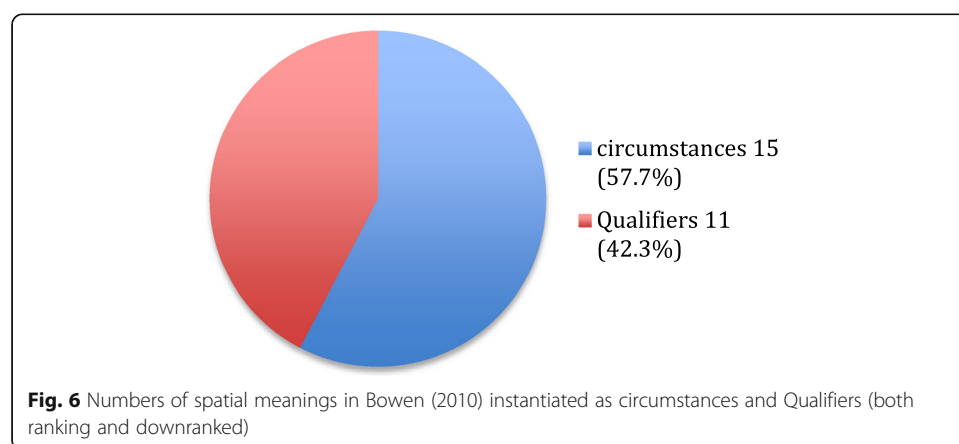
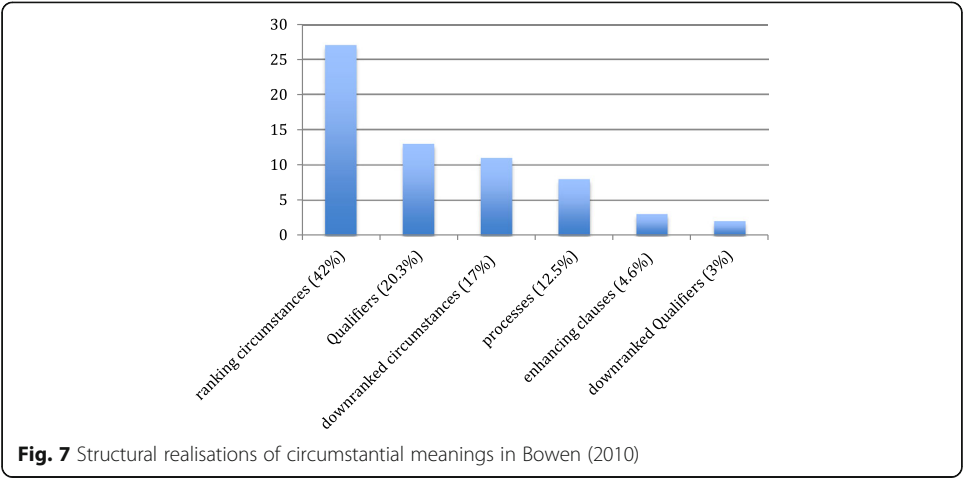


Table 7 Manner: quality meanings in Bowen (2010)

CI	Circumstance	Process
5	very successfully	
9.2		mirrors (means <i>exactly</i> resembles)
11.2, 14.2,		target (means aim at <i>precisely</i>)
12.2	in both a dry state in bags and pickled in casks	
16.2		suggest (means offer <i>tentatively</i>) studying (means looking <i>at carefully & purposefully</i>)
17		offers (means provides <i>tentatively</i>)
19		examined (means scrutinized <i>thoroughly</i>)
20.1		demonstrated (means showed <i>evidentially</i>)
TOTAL	2	7

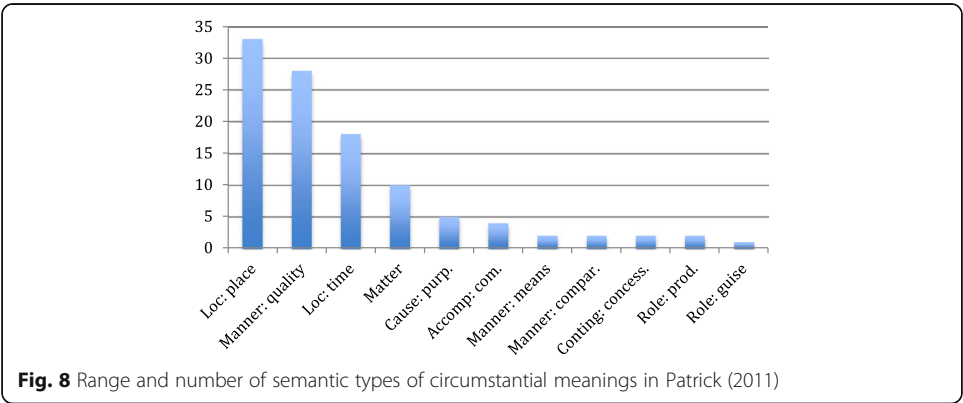


Returning to the structural configurations of all circumstantial meanings in Bowen, Figure 7 shows ranking circumstances are the most frequent structure for circumstantial meanings with 27/64 (42%) instances:

However, many circumstantial meanings are missed if only those instantiated as ranking circumstances are examined.

Circumstantial meanings in the second of the two history article introductions (focusing on the teaching of history in New Zealand primary schools)

We now turn to the second history article introduction by Patrick (2011), whose pattern of circumstantial meaning is similar to Bowen’s with Location: place and time as well as Manner: quality being the three most frequent types of circumstantial meaning. Patrick has slightly more circumstantial meanings overall than Bowen: 106 across 53 clauses (two per clause, whereas Bowen has 1.87 per clause), of 11 different types. Spatial location has 40/106 instances (or 37.7%), Manner: quality has 28 instances (or 26%), and temporal location has 18 instances (or 16.9%). The next most frequent in Patrick is Matter, with 10 instances. Figure 8 shows the numbers of these circumstantial meanings.



Similar to Bowen, the spatial meanings in Patrick are a combination of concrete places, telling where the events being discussed took place, and more abstract places, reflecting both the field of research, which is education, and the academic register. This range can be seen in Table 8 below:

Table 8 Range of spatial meanings in Patrick

	Type general	Type specific	Clause no.	Example
concrete	physical	human ^a	10.1	in children
			1.2	from primary, native, secondary and
		locational		technical schools around the country
			19	in primary schools
			22.4	in classrooms
			25.1	in early twentieth-century classrooms
		geographical	1.2	around the country
			3	at the Christchurch Teachers' Training
			4.1	College
			5.1	In some areas of the country,
			11	in the Chatham Islands
			15.1	in New Zealand
			17.3	in this country
			18.1	in New Zealand
			23	in New Zealand
			23	in Australia
				to New Zealand
	sociocultural	communal	5.2	among the local community
			11	from one almost exclusively devoted to
			18.2	examining the 'textual outputs' of colonial knowledge.
	semiotic			'under' the nation
			7.3	on permanent record
			13.1	In this piece
			18.1	In two recent articles
			22.1	in the historiography of history education
			24.2	in history lessons
			3	in rural education
				within the pedagogy of the early twentieth century New Education movement
		generic	15.1	in the role of knowledge in furthering
				colonization
				from one [a context] almost exclusively
			15.2	devoted to examining the 'textual outputs' of
				colonial knowledge.
			18.1	in this area
			18.2	on the products of the textual exchanges of a
			19	small national intellectual elite
			25.1	on 'specific practices, institutions and sites'
				from British patterns
				to their proper place in early twentieth-century classrooms
abstract	metaphoric ^d		11	between knowledge and colonialism in New
			12.2	Zealand
			14.1	in the shaping of colonial knowledge
				in the work of cultural transmission, such as
			15.1	in instilling imperial ideologies.
				in furthering colonization

^asee Bennett 2016 for the addition of a human place to physical places^bMetaphoric spatial meanings refer to meanings where the Head noun (Thing) is a grammatical metaphor (see Martin and Rose 2007; Dreyfus and Jones 2011)

Table 8 shows that as Patrick's introduction progresses, moving from its narrative beginnings into its more abstract argument, there is generally a corresponding movement towards more abstract and semiotic places.

The second most frequent type of circumstantial meaning in Patrick, Manner: quality, occurs frequently and mainly within the process, as can be seen in Table 9 below.

Table 9 shows that Patrick's introduction makes strategic use of the process to encode Manner: quality into her argument, making this almost the second most frequent circumstantial meaning. These meanings strengthen and sharpen, bringing the evaluation into the role of process and quite powerfully position the reader to align with her arguments.

Turning to temporal meanings in Patrick, we find a different range and pattern than in Bowen. While in Patrick there are many temporal meanings instantiated as circumstances (7/18 or 38.8%), only three of these are in Theme position. Thus time is not as much a foregrounded feature in Patrick as it is in Bowen, even though both are from the discipline of history. Instead, there are a number of

Table 9 Manner quality meanings across structures in Patrick

Cl	Circumstance	Process	Downranked circumstance
3		reflected upon (means thought <i>carefully</i> about)	
6.1			suddenly
8		highlights (means indicates <i>prominently</i>)	
10.1		need (means required <i>necessarily</i>)	
10.2		contends (asserts <i>strongly</i>)	
11		devoted (<i>wholly</i> concerned with)	almost exclusively
12.1		argue (means reason <i>strongly</i>)	
12.2		need (means require <i>necessarily</i>)	
16.1		engaging (discussing <i>analytically & argumentatively</i>)	
16.2		surface (means arise <i>significantly</i>)	
17.1		pointed to (means indicated <i>particularly</i>)	
17.2		arguing (reasoning <i>strongly</i>)	
17.4	adequately		
18.1		criticized (means described <i>unfavourably</i>) to concentrate (means <i>exclusively</i> focus on)	
18.2		ignoring (means <i>wilfully</i> failing to consider) centred (means <i>principally</i> concerned with)	
19		examines (means scrutinises <i>thoroughly</i>) prioritized (means arranged <i>purposefully</i> , i.e., in order of perceived importance)	
20		criticized (means described <i>unfavourably</i>)	
22.1		loom (means appear <i>very prominently</i>)	
22.2		failed to interrogate (means did not question <i>analytically</i>)	
24.1		contend (means argue <i>strongly</i>)	
24.2		preoccupied [with identifying] (means focused <i>exclusively</i> on)	
24.3		condemning (means disapproving <i>severely</i> of)	
24.4		ignoring (means <i>wilfully</i> failing to consider)	
25.2		considering (means thinking <i>carefully</i> about)	
1		25	2

enhancing clauses, some of which are temporal, and all begin with the conjunction 'while', eg:

- 16.1 **While** a body of scholarly writing engaging with Gibbons' work has appeared over (during) the past few decades,
 16.2 critiques of the approach taken by Gibbons and historians influenced by his ideas have also begun to surface.

This use of temporal circumstantial meaning as a dependent clause is one of the rhetorical features that contribute to Patrick's argument. These combine with replacive ones (Halliday and Matthiessen 2004), that is, ones that can be replaced with 'whereas', and begin almost a third of the way through the introduction, occurring every few clauses till the end. All temporal meanings in Patrick, and how they are instantiated, can be seen in Table 10 below.

As Table 10 shows, unlike Bowen, whose introduction had many temporal meanings as Qualifiers, Patrick favours both enhancing clauses and ranking circumstances for instantiating temporal meanings.

Of the four other types of circumstantial meaning in Patrick that have five or more instances, Matter (10), Accompaniment comitative (6) and Cause purpose (5), only the most frequent is Matter, is discussed. As with all circumstantial meanings, Matter adds detail, in this case about whatever it is connected to. It occurs at constituent level and below, with three of the eight instances being circumstances (one downranked), while six are Qualifiers:

Thus, as Table 11 shows, where Bowen favours spatial meaning as Qualifiers, Patrick favours Matter. This perhaps points to different sub-fields of history: Bowen's history is an exploration of past events, thus favours spatial meanings of events in time whereas

Table 10 Types of structures instantiating temporal meanings in Patrick (2011)

CI	Enhancing clause	Circumstance	Downranked circumstance	Qualifier	Downranked Qualifier
1.1		In 1938 (Theme)	in 1940		
1.2			from primary, native, secondary and technical schools	around the country	
2		By the time the competition closed (Theme)			
3		Afterwards (Theme)			
7.1	While...				
11		Recently (Theme)			
16.1	While...	over the past few decades			
17.1		in 2002			
17.3	'while...				
18.2	while...				
22.1	while...				
22.2			in the past		
24.3		often			
24.4	while...		over time		
Total	6	7	4	1	0

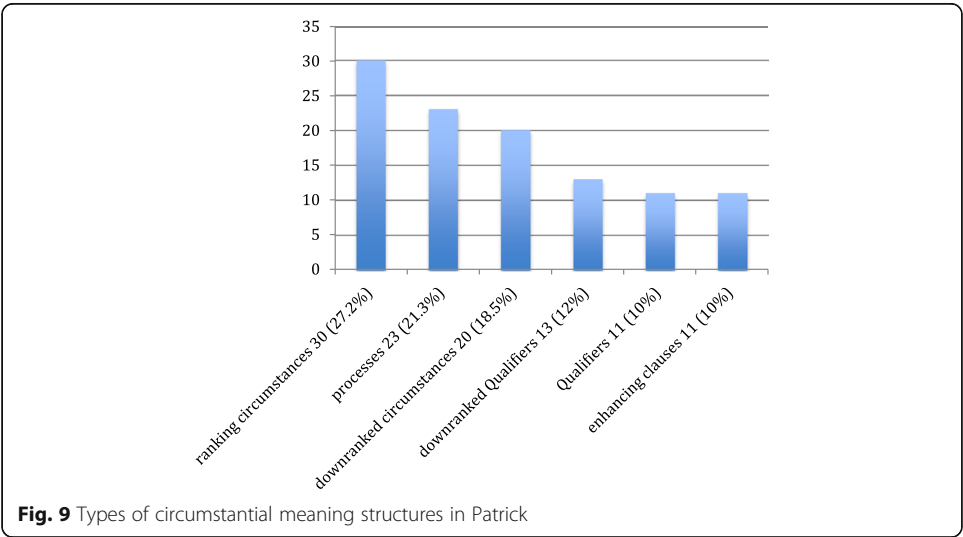
Table 11 Circumstantial meanings of Matter in Patrick (2011)

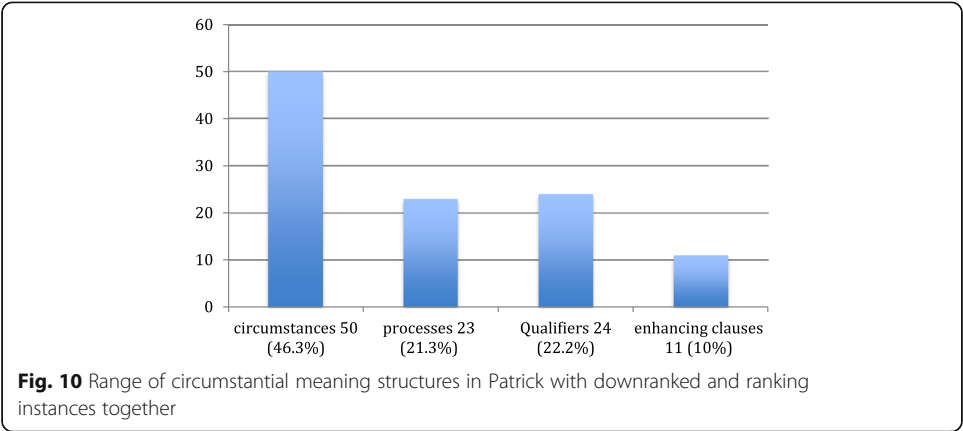
CI	Circumstance	Downranked circumstance	Qualifier
5.1			about the Moriori, Maori and Pakeha habitation of their islands
10.1			to do with a colonial context than with the aim of developing particular qualities and capacities in children through the medium of locally based lessons.
11			over the connections between knowledge and colonialism in New Zealand
14.2	(to) the compulsory state primary school system		
20		in relation to histories of colonialism	
21			on educational content
22.2			on what history education was 'like' in the past
23	in relation to the historiography of history education in Australia		
24.4			about producing political ideas or passing on a discrete quality of historical knowledge
Totals	2	1	6

Patrick’s history is more focused on sources, thus reflecting the ‘aboutness’ of history in Matter. Patrick’s Matter Qualifiers function to commit more meaning to the nominal groups in which they occur by specifying the Head word in terms of what the Head word is about, for example:

The pupils of the Kairakau Primary School in the Chatham Islands, for instance, had collected stories **about the Moriori, Maori and Pakeha habitation of their islands**

Returning to all circumstantial meanings in Patrick, Fig. 9 shows they are instantiated as a variety of structural types.





As Figure 9 shows, ranking circumstances account for just over a quarter of all circumstantial meanings (27.2%), processes infused with manner another 21%. If we collapse both the ranking circumstances and Qualifiers with their downranked counterparts, these proportions change to circumstances making up half almost the circumstantial meanings (46.3%), Qualifiers and processes being just over a fifth each (21.3 and 22.2% accordingly), and enhancing clauses making up a tenth (10%), as per Figure 10.

Circumstantial meanings in the first of the two chemistry article introductions

We now turn to the two article introductions from chemistry (Brooks et al. 2013 and Kennedy et al. 2013), as a counterpoint to the history introductions, as we know there are differences in the discourses of science and history (Bernstein 1999, Martin 2011).

Brooks’ et al. (2013) article is from the discipline of electrical engineering/chemistry and focuses on the use of zinc for storing solar energy. The introduction has 59 clauses and 81 circumstantial meanings in total, a ratio of 1.37 circumstantial meanings per clause. As can be seen in Figure 8, the most frequent semantic type is Cause: purpose (18/81 or 22%), followed by Manner: quality (13/81 or 16%), then Location: time and Role: guise each have eight instances (9.8%), Manner: degree has six (7.4%), Role: product, Cause: reason and Location: place have five (6%). These and the other instances numbering less than five can be seen in Figure 11 below:

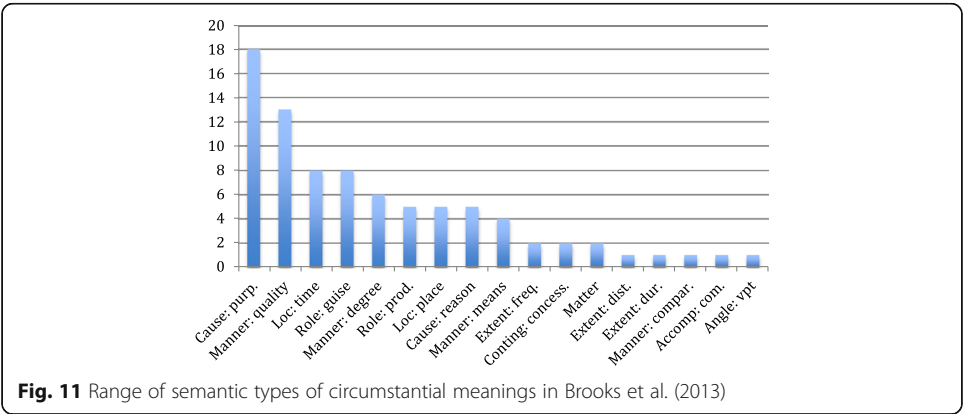


Figure 11 shows that unlike the history introductions, where circumstantial meanings of both time and place predominate, in Brooks, it is Cause: purpose that is most prevalent. Cause: purpose meanings are instrumental in enabling Brooks’ promotion of zinc as a candidate for storing solar energy. These Cause: purpose meanings are instantiated across a range of structures, as per Table 12, below.

As Table 12 shows, it is enhancing clauses that are used most frequently to instantiate meanings of Cause: purpose, suggesting that Brooks et al. are driving the reasoning for the proposed arguments with all structures, from the clause right down to the Qualifier. These resources are a key feature of the argument as they span the whole introduction, beginning in the second clause complex and continuing through to the fourth last.

The next most frequent circumstantial meaning in Brooks et al. is Manner: quality, with 13 instances, of which nine are processes.

As Table 13 shows, Manner: quality instantiated as process is a quite frequent circumstantial meaning in Brooks et al., highlighting the power of the process to be harnessed for his argument. As Hood argues, (2010: 92) Manner processes invoke “a reading of increased effort, vigour or rigour”, while maintaining apparent objective balance, an essential feature of scientific writing.

The seven Location: time meanings in Brooks et al. are all instantiated as ranking circumstances, and mainly refer to chemical processes as they unfold in the explanation genre² embedded in the introduction:

- 3.1 currently
- 17 concomitantly
- 19.1 subsequently

Table 12 Types of structures instantiating Cause: purpose meanings in Brooks et al. (2013)

CI	Enhancing clause	Circumstance	Downranked circumstance	Qualifier	Downranked Qualifier
2				for renewable energy applications [[to thrive]]	
4.2	for replacing hydrocarbons for mobile applications	for mobile applications			
7.2			for transportation applications		
8.1	(In order) To illustrate,				
8.3				for mobile H2 use	
10.1		for this application			
11.1				for energy storage	
11.1					
14.1		for storage			
16.1	(In order) To make use of				
18	for such a scheme		for the initial absorption of a photon		
19.2	for driving the Zn/air cell				
28.2			for eventual use as a solar fuel		as a solar fuel
29.3	(In order) to photoreduce				
29.5			for a solar fuel		
	6	3	4	3	1

Table 13 Manner: quality meanings across structures in Brooks et al. (2013)

CI	Circumstance	Process	Downranked circumstance
2		thrive (expand <i>significantly & sustainably</i>)	
6.3	easily		
15		exemplify (show or illustrate <i>excellently</i>)	
17		driven (impel <i>powerfully</i>)	
19.1		drive (impel <i>powerfully</i>)	
19.2		driving (impel <i>powerfully</i>)	
20		stand out (show up <i>strongly</i>)	
21.1	independently		
23.1			more prominently
26		driven (impel <i>powerfully</i>)	
32.3		required (demanded <i>compulsorily</i>)	
28.2		demonstrates (shows <i>evidentially</i>)	
32.3	commonly		
	3	9	1

23.1 in many redox reactions [(that are) including organic radical polymerization,¹⁵ cyclizations,¹⁶ aldehyde fluoromethylation,¹⁷ the water gas shift reaction,¹⁸//and (that include) more prominently, the reduction of H²O and Co² for solar fuels.^{19,20}]]³

24.1 In H₂ evolving, water reduction reactions⁴

32.1 at 1100 K

32.3 during cooling process

Of the eight Role: guise meanings, half (four) are instantiated as ranking circumstances, while three are Qualifiers. These Role: guise meanings help to sell Brooks et al.'s argument for zinc as a means of solar energy storage (Table 14).

The last kind of circumstantial meaning we examine in Brooks et al. is Manner: degree, with six instances. These are all instantiated as circumstances, with five ranking and one downranked, as per Table 15 below:

These Manner: degree meanings function to discount other possibilities while building up the suitability of zinc for solar.

Table 14 Role guise meanings in Brooks et al. (2013)

	Circumstance	Qualifier	Downranked circumstance	Downranked Qualifier
4.1			as chemical potential	
6.3,	as a mobile fuel.			
7.1	as a promising candidate			
15		as a transportable, abundant solar fuel		
16.1		as a renewable solar fuel		
20	as PSs			
23.2	as photocatalysts			
28.2				as a solar fuel
	4	3	1	1

Table 15 Manner: degree meanings in Brooks et al. (2013)

	Circumstance	Downranked circumstance on a massive scale
3.2		
7.2	partially	
11.2	greatly	
14.2	slightly	
25.2	greatly	
32.2	generally	

Circumstantial meanings in the second of the two chemistry article introductions

We now turn finally to Kennedy et al., the second of the chemistry article introductions in the corpus. Kennedy et al.'s article is from the discipline of coordination chemistry and focuses on an approach, called the weak link approach, for assembling complicated molecular structures. The introduction has 82 clauses with 55 circumstantial meanings (a ratio of .67 per clause). As Figure 12 shows, the most frequent type is Location: place, with 14/55 instances (25.4%), followed by Manner: quality, with 11 instances (or 20%) and then Manner: means (8/55 or 14.5%). The other circumstantial meanings have five or fewer instances, but together make up 22 instances in total. Those with five or more instances will be discussed. Figure 12 shows Kennedy et al.'s spread of circumstantial meaning types:

The predomination of Location: place meanings in Kennedy et al. confirms the overall trend of Location: place being the most frequent of all types of circumstantial meaning. While this is also similar to the trend in the history introductions, Table 16 shows the types of place in Kennedy et al. are entirely different to those in history, reflecting the difference in field.

Table 16 shows that of the 13 spatial meanings in Kennedy et al., ten are technical entities from the field of coordination chemistry. These technical meanings focus on locations of aspects of the weak link approach. However, it is important to note that the spatial education meanings, both begin and end the introduction to topic, and in doing so, position the reader to align with the writers by identifying them as part of the research community:

Within the discipline of coordination chemistry, the weak-link approach (WLA)^{1–6} has emerged as a powerful means [[to assemble complicated supramolecular structures (Scheme 1)....

...examples of this aspect of biomimicry are otherwise rare **in coordination chemistry**.

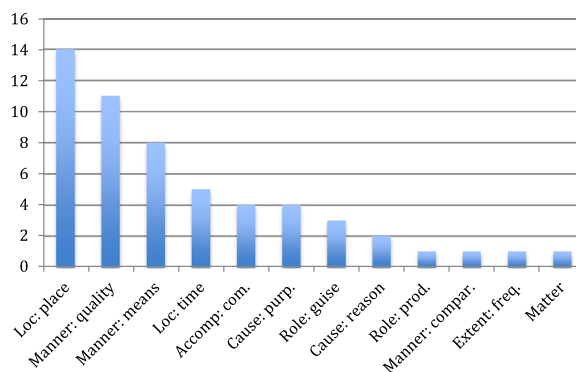
**Fig. 12** Circumstantial meanings in Kennedy et al. (2013)

Table 16 Types of spatial meaning in Kennedy et al. (2013)

Type	Example
Semiotic	Herein (means: in this journal article)
Educational	Within the discipline of coordination chemistry in coordination chemistry
Technical/chemical	between rigid and flexible states into the ligands in the properties of the complex between electron-rich and electron-poor hemilabile ligands into WLA architectures on the precise positioning of active groups that are incorporated into the hemilabile ligand into the hemilabile ligand to an aryl group in either protic or nonpolar solvents from a variety of aryl-based hemilabile P,S, P,O, and P,N ligands

Furthermore, the only semiotic spatial meaning, ‘Herein,’ (referring to the paper itself) strategically positions the reader to consider the paper and its proposed solutions as unique, practical and successful:

Herein, we report a new method [for the clean and quantitative synthesis of rigid platinum(II) WLA assemblies (Scheme 1: 2,3,6,7,8,9,) via partial abstraction of chloride in either protic or nonpolar solvents.]

These spatial meanings occur across a range of structures, with ranking circumstances being the most frequent and downranked circumstances being the second most frequent, as can be seen in Table 17.

Table 17 Spatial meanings across structures in Kennedy et al. (2013)

Cl	Enhancing clause	Circumstance	Qualifier	Downranked circumstance	Downranked participant
1		Within the discipline of coordination chemistry			
2				between rigid and flexible states	
3		into the ligands		in the properties of the complex	
5		in coordination chemistry			
8.2	in which...				between electron-rich and electron-poor hemilabile ligands
8.3		into WLA architectures			
9		on the precise positioning of active groups that are incorporated into the hemilabile ligand		into the hemilabile ligand	
10.2				to an aryl group	
18		Herein	in either protic or nonpolar solvents		
19.2		from a variety of aryl-based hemilabile P,S, P,O, and P,N ligands			
	1	7	1	4	1

Similar to Brooks, the second most frequent circumstantial meaning in Kennedy et al. is Manner: quality, with 11 instances across three structures, as per Table 18:

Table 18 Manner: quality meanings across structures in Kennedy et al. (2013)

CI	Circumstance	Process	Downranked circumstance
1		emerged (means arose <i>importantly</i>)	
8.2	exclusively		
9		rely (means depend <i>confidently</i>)	
10.2			directly
11.1	cleanly reliably		
14.1		demonstrated (means shown <i>evidentially</i>)	
14.2	cleanly spontaneously		
15.1			inherently
17		failed (means absolutely unsuccessful)	
Total	5	4	2

These Manner: quality meanings amplify the significance of the research into the weak link approach, building the perception of success.

The third most frequent circumstantial meaning in Kennedy et al. is Manner: means, with eight instances. These are instantiated across four structures, as per Table 19.

While there are only 10 Manner: means meanings, they are an important feature in Kennedy et al., providing detail about the workings of chemical processes in the weak link approach.

The final circumstantial meaning we explore in Kennedy et al. is Location: time, which has five instances, all of which refer to some aspect of when chemical processes happen (Table 20).

Table 19 Manner: means meanings across structures in Kennedy et al. (2013)

CI	Enhancing clause	Circumstance	Qualifier	Downranked circumstance
2				via the introduction and removal of elemental anions or small-molecule "effectors"
3		in such a way that the structural change results in a marked change in the properties of the complex.		
9				via the WLA
10.2	by using...			
11.2	by using...			
14.3		in combination (e.g. Scheme 2; compound 22)		
18			via partial abstraction of chloride in either protic or nonpolar solvents	
19.1	Using this method,			
	3	2	1	2

Table 20 Location time meanings across structures in Kennedy et al. (2013)

CI	Enhancing clause	Circumstance
7.1		Upon chelation to a d ⁸ metal center (e.g., rhodium(I), palladium(II)) in the absence of coordinating anions
7.2	while preventing the formation of polymeric and oligomeric by-products	
14.3	when alkyl- and aryl-based hemilabile compounds are used in combination	
17.1		so far
	2	3

Discussion: comparison of circumstantial meanings across the corpus

After examining the circumstantial meanings in the four texts individually, we now look at these together, beginning with the number of meanings per clause, followed by the frequency of the different types. Table 21 shows the number of circumstantial meanings per clause across the four articles.

While the corpus contains some clauses with no circumstantial meanings, and others with many, Table 21 shows that on average there is at least one circumstantial meaning per clause, regardless of the discipline. However, the small size of the corpus does not really allow us to draw any conclusions about the differences in disciplinary instantiations of circumstantial meanings. Nevertheless, we can reiterate that Location: place meanings are the most commonly instantiated circumstantial meaning across all four texts, but the types of place vary according to the field of the article.

Casting the net more widely, we now examine the four most frequent circumstantial meanings (those with five or more instances) in each text.

As Table 22 shows, three types of circumstantial meaning dominate the frequency: Location: place, Location: time and Manner: quality. Location: place is the most frequently instantiated in two of the four texts, Bowen's history and Kennedy et al.'s chemistry. In addition, it is the second most frequent meaning in Patrick and equal fourth in Brooks. This confirms what we have already seen with circumstances of this type being the most frequent in other corpora ((Matthiessen, C. M. I. M. 1998. *The Transitivity of Space in Topographical procedures*. Unpublished); Dreyfus and Jones 2011).

Location: time is the most frequent in Bowen, the third most frequent in Patrick and Brooks, and the fourth most frequent in Kennedy. In Bowen and Patrick these relate to past historical events, whereas in Brooks and Kennedy they relate to the timing of chemical processes and how they determine other chemical events.⁵ We can thus say that time is a significant feature across these textual instances from the disciplinary knowledges of both history and chemistry.

Table 21 Number of circumstantial meanings across the corpus

	Number of clauses	Number of circumstantial meanings	Ratio per clause
Bowen	31	58	1.87
Patrick	54	108	2
Brooks et al.	59	81	1.37
Kennedy et al.	32	51	1.59

Table 22 Frequency of the four most instantiated circumstantial meanings in the corpus

	Most frequent	2 nd most frequent	3 rd most frequent	4 th most frequent
Bowen	Location: time 28 (43.75%)	Location: place 11 (17%)	Manner: quality 10 (15.6%)	
Patrick	Location: place 33 (31%)	Manner: quality 28 (26%)	Location: time 18 (16.9%)	Matter 10 (9%)
Brooks	Cause: purpose 18 (22%)	Manner: quality 13 (16%)	Location: time & Role guise 8 (9.8%)	Role: product, Cause: reason & Location: place 5 (6%)
Kennedy	Location: place 14 (25.4%)	Manner: quality 11 (20%)	Manner: means 8 (14.5%),	Location: time 5 (9%)

Manner: quality is the third most frequent meaning in Bowen, and the second in the other three texts. Most of these meanings are instantiated as processes, as can be seen in Fig. 13:

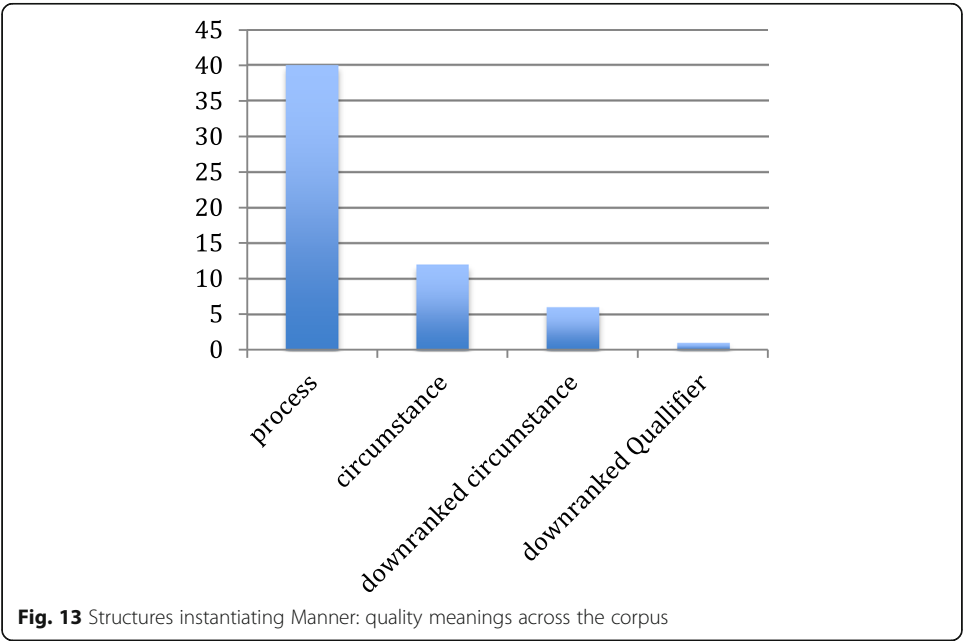
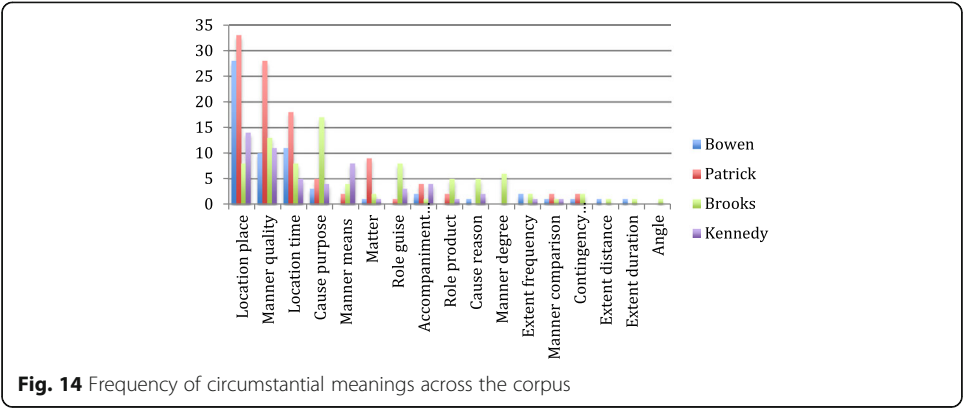


Fig. 13 Structures instantiating Manner: quality meanings across the corpus

Figure 13 shows that processes make up 40/59 (67.7%) of the Manner quality meanings in the corpus, showing the power of the process to contribute to and drive the argument in research articles, thus positioning the reader to adopt a favourable view of



the research. From an interpersonal perspective, these can be examined as instances of GRADUATION that raise the intensity of the meaning. We know from Hood’s (2010) study of research articles that these kinds of processes are prevalent in research writing across a range of disciplinary knowledges.

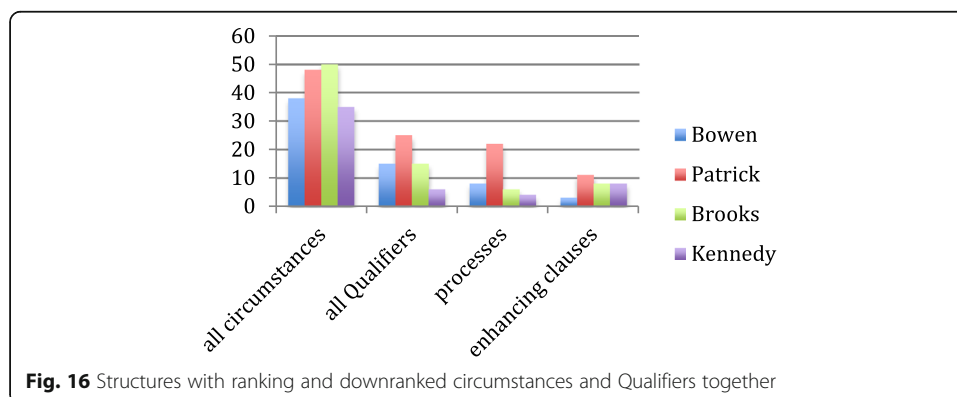
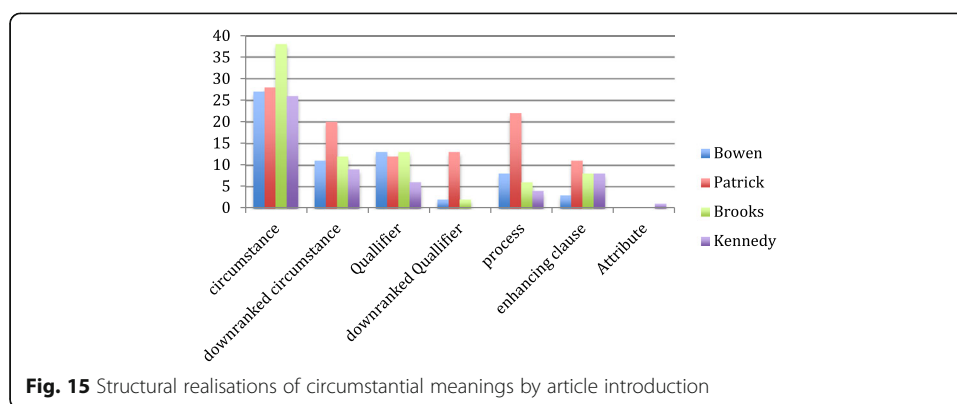
While there is a high frequency of time, place and manner meanings in the corpus, there are also 17 of the possible 22 types of circumstantial meanings in the corpus. The frequency of these types in descending order can be seen in Figure 14.

The types of circumstantial meaning not found in this corpus are Cause: behalf, Contingency: condition, Contingency: default, Accompaniment: additive and Angle: source.

Regarding structures instantiating circumstantial meanings, as stated at the beginning of this paper, the most frequent structure across all four texts is circumstance. This can be seen in Table 23, which shows frequency of structures in descending order.

Table 23 Structures instantiating circumstantial meanings across the corpus

	Most frequent	2 nd most frequent	3 rd most frequent	4 th most frequent	5 th most frequent	6 th most frequent
Bowen	circumstance 27	Qualifier 13	downranked circumstance 11	process 8	enhancing clause 3	downrank- ed Qual 2
Patrick	circumstance 28	process 22	downranked circumstance 20	downranked Qualifier 13	Qualifier 12	enhancing clause 11
Brooks	circumstance 38	Qualifier 13	downranked circumstance 12	enhancing clause 8	process 6	downrank- ed Qual 2
Kennedy	circumstance 26	downranked circumstance 9	enhancing clause 8	Qualifier 6	process 4	Attribute 1



This can also be viewed as a graph:

Table 23 and Figure 15 show that while in all article introductions circumstance is the most common way to instantiate circumstantial meanings, in Patrick, process comes a close second. However in no other article are there any lexicogrammatical structures that come close in number to circumstance. Nevertheless, all the other instantiations together make up a large number of circumstantial meanings that would be missed if we did not view the texts from this standpoint.

Additionally, if we collapse the downranked circumstances and Qualifiers into their ranking counterparts, this picture changes markedly, with both the number of circumstances and Qualifiers increasing substantially, as can be seen in Figure 16.

Conclusion

This paper has attempted to show another way of looking at circumstantial meaning, one which focuses on all the lexicogrammatical realisations of circumstantial meanings, not just the circumstance. Building on Halliday and Matthiessen (2004) and Martin's (1992) discussions about these kinds of meanings in a range of lexicogrammatical structures, this paper has attempted to draw all these diverse realisations of circumstantial meanings together and examine them across a small corpus of article introductions to show that different article introductions instantiate a different range of circumstantial meanings in a variety of structures. The results of

the analysis have shown that circumstance is still the most frequent structure for instantiating circumstantial meanings, however other lexicogrammatical structures such as Qualifiers, processes and enhancing clauses are also frequently used. This paper has also shown that Location: place meanings are the most frequently instantiated circumstantial meaning across all four articles, regardless of the general and specific field, though the kinds of place are different, depending on the field. Manner: quality (instantiated primarily in processes) is also a common type of circumstantial meaning, as is Location: time, but again, different kinds of time are instantiated, depending on the field. Of note is the frequency of Cause: purpose in Brooks’ introduction, which is like no other introduction, and again corresponds to the specificity of arguing for a type of substance for storing solar energy.

As argued at the beginning of this paper, analysis of this kind goes beyond an analysis of circumstances, which can only show how circumstantial meanings are realised in one lexicogrammatical structure. Circumstantial meanings are an under-researched area of SFL, perhaps because the work has not been fully developed, and perhaps because in an analysis of experiential meanings, circumstances have been seen as peripheral to the more nuclear meanings of processes and participants (Halliday and Matthiessen 2004; Martin 1992). This research highlights the value of seeing the constituent of circumstance as only one part of a larger region of meaning – circumstantial meaning – which can be used to examine how the kinds of meanings are realised in different texts. Of course a further study of circumstantial meanings in other genres and fields is necessary for the continuation of this work.

This work has pedagogical implications as stated at the beginning of the paper – novice analysts frequently confuse non-circumstance realisations of circumstantial meanings with circumstances. This work provides a coherent and simple way through this problem in its articulation of the way circumstantial meanings can be realised by a range of different structures.

As a final note, while we have examined circumstantial meanings alone, they would of course be viewed as only one part of a whole range of linguistic analyses of texts that explore how texts such as these article introductions make meaning using different language resources.

Endnotes

¹It is argued here that the nominal group *The arrival of some 35,000 Chinese gold miners to Victoria* has two Qualifiers: *of some 35,000 Chinese gold miners* being the first and *to Victoria* being the second as per the table below:

<i>The</i>	<i>arrival</i>	<i>of some 35,000 Chinese gold miners</i>	<i>to Victoria</i>
Deictic	Thing	Qualifier 1	Qualifier 2

²Unsworth (2001) has described implication sequences in the explanation genres of science

³In this instance, “in” means “during”

⁴As per footnote 5

⁵For a more in depth examination of temporal meanings in these texts, see Bennett 2016.

Authors' contributions

SD came up with the ideas and wrote the article as well as supervised IB Masters thesis research which involved the transitivity and circumstantial meaning analysis of the journal articles used in the paper. SD did all the comparative work of the numbers and kinds of circumstantial meanings that are reported on in the paper. Both authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Received: 10 November 2016 Accepted: 20 December 2016

Published online: 23 February 2017

References

- Bennett, I.M. 2016. *Contextual meanings: an investigation of their persuasive power in research article introductions*. Unpublished thesis submitted 2016. University of Sydney.
- Bernstein, B. 1999. Vertical and Horizontal Discourse: an essay. *British Journal of Sociology of Education* 20(2): 157–173.
- Bowen, A. 2010. The central role of Chinese people in Australia's colonial fishing industry. *Journal of Australian Colonial History* 12: 97–118.
- Brooks, A.C., K. Basore, and S. Bernhard. 2013. Photon-driven reduction of Zn²⁺ to Zn metal. *Inorganic Chemistry* 52: 5794–5800.
- Coffin, C. 2006. *Historical discourse: the language of time, cause and evaluation*. Continuum Discourse. UK: Continuum.
- Dreyfus, S.J., and P. Jones. 2011. Mapping Place: further delicacy in circumstantiation. In *Explorations in the theory and application of Systemic Functional Linguistics*, ed. Fang Yan. Beijing: Higher Education Press of China.
- Halliday, M.A.K. 1985. *An introduction to functional grammar*. London: Edward Arnold.
- Halliday, M.A.K., and J.R. Martin. 1993. *Writing Science: literacy and discursive power*. London: The Falmer Press.
- Halliday, M.A.K., and C.M.J.M. Matthiessen. 2004. *An Introduction to Functional Grammar*. London & New York: Routledge.
- Hood, S. 2010. *Appraising research: evaluation in academic writing*. London: Palgrave.
- Kennedy, R.D., C.W. Machan, C.M. McGuirk, M.S. Rosen, C.L. Stern, A.A. Sarjeant, and C.A. Mirkin. 2013. General strategy for the synthesis of rigid weak-link approach platinum ii complexes: Tweezers, triple-layer complexes, and macrocycles. *Inorganic Chemistry* 52: 5876–5888.
- Martin, J.R. 1992. *English Text: System and structure*. Amsterdam: John Benjamins.
- Martin, J.R. 2007. *Construing knowledge: a functional linguistic perspective*. F. Christie & J R Martin [Eds.] *Language, Knowledge & Pedagogy: functional linguistic and sociological perspectives*. London: Continuum. 2007. 34–64. [reprinted in *Register Studies* 2012. 347–378].
- Martin, J.R. 2011. Bridging troubled waters: interdisciplinarity and what makes it stick. F. Christie & K. Maton [Eds.] *Disciplinary: functional linguistic and sociological perspectives*. London: Continuum. 35–61.
- Martin, J.R., and D. Rose. 2007. *Working with Discourse: Meaning beyond the Clause*. London: Continuum.
- Martin, J.R., and P.R.R. White. 2005. *The Language of Evaluation: appraisal in English*. London: Palgrave.
- Martin, J.R., K. Maton, and E. Matruglio. 2010. *Historical cosmologies: epistemology and axiology in Australian secondary school history* J R Martin, K Maton & E Matruglio *Revista Signos* 43.74, 433–463. [reprinted in *Language in Education* 2012. 386–387].
- Patrick, R. 2011. An antidote to bookishness: local history, educational practices and colonialism in New Zealand primary schools, 1900–1940. *New Zealand Journal of History* 45(2): 192–208.
- Swales, J.M., and C.B. Feak. 2012. *Academic writing for graduate students*, 3rd ed. Ann Arbor: University of Michigan Press.
- Unsworth, L. 2001. Evaluating the language of different types of explanations in junior high school science texts. *International Journal of Science Education* 23(6): 585–609.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► springeropen.com