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Advances in Language and Education
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Acknowledgements

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We thank Timothy Ryan Day for his help with the index.
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1 Introduction

In the 1960s, M. A. K. Halliday and his colleagues set about to develop a model of linguistics which could better support language teaching than could the grammars then available (Halliday et al. 1964; Mackay et al. 1973; Halliday and Hasan 2006). Out of these projects grew Systemic Functional Linguistics (SFL), a functional theory of language, which has had profound impact on educational practices today, not only in language education, but in education as a whole, for instance through the genre-based literacy approach (cf. Martin and Rothery 1986). (See Whittaker et al. 2006 for applications of SFL in education around the world).

However, the classroom is not static, and the changing face of educational needs has been a driving force behind both how SFL has been applied and how it has been extended. For instance, the 1970s saw an increasing pressure to produce critical readers – readers who could discern the way discrimination and social inequality are established and maintained through discourse. In response to this need, Critical Discourse Analysis (CDA) arose as a set of techniques for revealing implicit world-views in text, and thus allow readers to avoid the subliminal manipulation of their ideologies.

Earlier work in CDA has been criticized as too anecdotal, basing analyses on selected phrases within a text, rather than systematic study. However, increasingly, analysts have turned to SFL to inform deeper, grammatically based analyses of text. In recent years, CDA in various forms is entering the classroom, as part of the resources given to both first and second language learners (cf. Janks 1991).

While CDA draws upon Hallidayan SFL, other educational needs have forced radical advances within SFL. In recent years, researchers in and about SFL have started to focus on two areas which were not centrally addressed in the Hallidayan model, but clearly of relevance to language education:
1) The need to deal with multimodal ‘texts’: SFL has been oriented towards the analysis of spoken and written language. However, daily we are confronted with texts where the message is communicated not only via text, but via the interaction between text and images on the page. Language education needs to teach learners how to interpret such texts, and teaching needs to be supported by a well-formulated theory of how different modes interact. The same is true for the interaction of image and audio in film. The web also has introduced new kinds of texts, intermixing media in ways never seen before.

2) The need to analyse the attitudes expressed in text: While SFL recognized an ‘interpersonal’ component of meaning, the model as stated did not readily support the analysis of speaker attitudes in text. During the 1990s, Peter White, Jim Martin and others developed an approach to attitudinal text analysis, complementary to SFL, called ‘Appraisal Theory’ (Martin 2000; Martin and White 2005; White 2006). Appraisal Analysis has started to show its usefulness in language education, allowing learners to see how the choice of wording not only encodes states of affairs, but also the speaker/writer’s attitude to the entities and events of the text.

While the digital age has confronted us with new kinds of texts, it has also provided us with new resources with which to deal with them. One such tool is the computational corpus, which allows large bodies of text to be searched rapidly, so that we can explore the patterns of language as never before. This has permitted researchers to examine in more depth the ways in which lexis and grammar work together, allowing for greater explicitness in terms of language patterns and probabilities of co-occurrences. The increased understanding of how language works in practice offers new insight as to how language education should proceed.

This book presents these developments in linguistic theory – mainly extensions of and around SFL – and their applications to changing needs in education. It is really only in the new century that these techniques have become mature enough to be used in the classroom, and to start to change the way education through and about language takes place, providing new tools for language educators and, in some cases, for the language learners themselves.

2 Multimodality and education

Advances in technology are affecting the ways in which we represent our world, in educational settings and the workplace, where the printed page has long held supremacy, as it is now much easier to incorporate image and sound through the medium of the computer screen. Image has also come to hold a more prevalent place in printed materials, lessening, and perhaps in some cases overcoming, the domination of written text (see Kress and van Leeuwen 1996; Kress 2003 and this volume). According to Macken-Horarik (2004: 6), ‘[a]nalysis and production of integrated texts
has now become a routine part of school learning – whether in visual arts, science, geography or even English’. The inclusion of other modes of representation besides the written word is not actually a new phenomenon, as Lemke (2002: 24) points out, exemplifying with science textbooks which ‘contain not just words in sentences and paragraphs, but tables charts, diagrams, graphs, maps drawings, photographs, and a host of specialized visual representations from acoustical sonograms to chromatography strips and gene maps’. Work by researchers on mathematics (see, for example, O’Halloran, this volume) shows how different forms of representation work together, through intersemiotic expansion, to construct the field of mathematics. Yet, while multimodal representations in education are not new, the explosion of multiple modes of representation, brought about in large part through the revolution in technology, calls for different ways of understanding meaning-making in a given context. In other words, there is a clear need for a focus on multimodality in education, and the first section of this book responds to this need.

The current shift in ways of presenting reality through a wider variety of more easily accessible media parallels, in interesting ways, the shift which occurred when the printed word became more readily available. Scholars such as Eric Havelock and Walter J. Ong show how the development and proliferation of alphabetic writing systems ‘fundamentally altered cultural epistemologies’ (Casaregola 2003: 217). Gee (2003), in his work on the impact of video games on literacy development, reminds us that it is our situated selves that experience the material, social and cultural world in a certain way, often repeated time after time, which means that approaches to education need to take into account the material, social and cultural artefacts that shape text production. This challenge is taken up in Chapter 1, ‘Meaning, learning and representation in a social semiotic approach to multimodal communication’, where Gunther Kress addresses current shifts in the means we use for making representations, and reflects on how these shifts impact the ways in which we come to make sense of the world. As with the move from a manuscript culture to a print culture, where ‘[a]uthorities can be questioned much more easily and cheaply’ (Casaregola 2003: 215), Kress argues that increased sites for authorship through technology and multiple entry points in web pages and school textbooks mean that authority is appropriated by greater numbers of writers, and readers now take decisions as to how they make their own way through texts. This dispersion of authority needs a response: reflection on and changes in curricula.

We need, then, greater understanding of how multiple modes of representation combine to construct meaning, and also of how educators might best help in literacy development across the semiotic modes. SFL has provided a solid tradition of analysing text in context which analysts, educators and researchers have used to come to an understanding of the semiotic workings of language, in terms of how linguistic choices come together to convey meanings through the three metafunctions of
language: the ideational, or the way in which language is used to represent world of experience; the interpersonal, or the way language is used to establish and maintain relationships between people and also to express attitudes and opinions; and the textual, or the way language is used to organize these meanings. These understandings are helpful in setting up a solid basis for literacy development across a range of educational and workplace contexts (cf. Cope and Kalantzis 1993; Hasan and Williams 1996; Christie and Martin 1997; Christie and Mission 1998; Unsworth 2000; Schleppegrell and Colombi 2002; Whittaker et al. 2006).

However, new technologies with the accompanying expansion of modes of representation call for an expanded analysis, given that literacy practices often take place in settings where multiple modes of representation come together to make meaning. Macken-Horarik (2004: 6) states the call clearly when she writes ‘educators need access to analytical apparatuses (including grammars) which enable them to relate one modality to another in explicit and mutually informing ways’ and ‘students . . . need access to metasemiotic tools for analysing these texts – tools that enable them to move in a mutually comprehensible way between one modality and another’.

Kress (2003) and Kress and van Leeuwen (1996) have found Halliday’s multi-stratal language model a sound base when expanding from the study of verbal language to the study of multimodal discourse. There is a lot of support for this approach, stemming from initial work carried out by O’Toole (1994). Royce (2002) for example, picks up this application of the metafunctional approach to language as applicable to other semiotic modes as well:

...almost any image type can be analyzed in terms of what it presents, or its subject matter. A visual can also be considered in terms of who it is being presented to (the expected target audience), how the audience is being addressed (asked questions, given information, etc.), and whether there are relations of power or inclusion/exclusion being expressed. A visual can also be considered in terms of how it is presenting its messages, or in terms of its composition or layout.

At present, a lot of work is using SFL and related approaches to analyse multimedia texts. Burn and Leach (2004: 156), in suggesting ways of working with moving images in the English classroom, write that ‘references to linguistics can be productive, even provocative’, and specifically mention SFL and its three metafunctions as an apt way of analysing moving image in an educational setting. The New London Group (2000) calls for a framework of analysis with a metalanguage which allows for choices in representation to be related to the social contexts in which they are produced. Unsworth (2001) connects this call with SFL in its focus on the context of situation and the context of culture. Indeed, a growing amount of research being done within the SFL paradigm to analyse multimodal texts, and also to suggest paths of multimodal literacy development (cf. Kress and van Leeuwen 1996; Unsworth 2001; O’Halloran 2004; Ventola et al. 2004; Baldry and Thibault 2006; Hanauer 2006; Kress et al. 2006; Royce
and Bowcher 2006) and it is our purpose in this volume to add to this work.

The chapters in the first section present research and applications which help in our understanding of multimodal texts, responding, through SFL, to Kress’s concerns expressed in the opening chapter. The chapters focus on different educational levels, ranging from young children to university students. Addressing the early reader level, in Chapter 2: ‘Children’s picture book narratives: reading sequences of images’, Clare Painter looks at picture books as a child’s first experiences of written narrative, and develops Kress and van Leeuwen’s (1996) work to take greater account of inter-visual (and eventually inter-modal) meanings in narrative texts so as to enhance engagement in visual literacy education.

This chapter is complemented by Chapter 3: ‘Popular culture in the classroom: interpreting and creating multimodal texts’, in which Katina Zammit describes work done in the classroom on analysis and production of multimodal texts by primary-school children. Zammit explains the genre-based teaching/learning cycle, in particular the methods of scaffolding students’ understandings of visual, written and multimodal texts in paper-based and electronic media. She argues that this kind of work in the classroom can help young readers attain a more critical reading position, and thus be more aware of how texts may attempt to manipulate thoughts and feelings.

Moving up to secondary school, in Chapter 4: ‘Systemic functional multimodal discourse analysis (SF-MDA) approach to mathematics, grammar and literacy’, Kay O’Halloran provides a systemic-functional framework for analysing written mathematical discourse in terms of its language, mathematical symbolism and the mathematical visual images used. She discusses the implications for literacy in terms of the grammars, strategies for encoding meaning and metaphorical shifts which take place in mathematical discourse. At the tertiary level, Chapter 5, ‘Multiliteracies for academic purposes: multimodality in textbook and computer-based learning materials in science at university’, by Janet Jones, analyses the changes brought about by information and communication technologies in literacy and pedagogical practices. Jones is interested in understanding the kinds of literacies students need in the new multimodal, hypertextual and multimedia learning environments, and discusses the results of a multimodal content analysis of a corpus of textbook and computer-based learning materials from undergraduate science courses at the University of Sydney. She takes into account the relationship between visual and verbal elements, including technicality and abstraction in the various modes, and considers implications of the interplay across modes for developing students’ multiliteracies for academic purposes. Thus, the chapters in this section all provide ways in which those involved in education can move towards helping learners untangle the complexities of multimodal representations in their classrooms.
Multimodality is not the only reason why SFL has needed to develop to address the changing needs of language in education. There has been a growing need to produce critical readers, readers who can not only read the overt meanings in a text, but can also read between the lines to see covert representations, to see the implicit assumptions in text which can shape the reader’s point of view without them being aware of this.

CDA has its roots in the work of Kress, Fowler, Hodge and Trew during the late 1970s (Fowler et al. 1979; Hodge and Kress 1979), and has slowly become more rigorous in its analysis, moving away from its original, rather anecdotal methodology and developing more systematic analysis of the text as a whole. One aspect of this increase in systematicity was greater use of grammatical analysis, and, in particular, while certainly not the sole source, SFL has been increasingly involved in CDA analyses. Kress himself has been a prominent figure in SFL (e.g. Kress 1976), and much of his metalanguage draws on SFL. Fowler also draws on SFL, as he acknowledged:

Halliday’s systemic-functional linguistics . . . is specifically geared to relating structure to communicative function, and this model provides most of my descriptive apparatus. (1991: 5)

Increasingly, CDA has been applied in language education. For instance, during the 1990s, Fairclough (Fairclough 1992), Janks (e.g. Janks 1991) and others developed CDA as a tool for classroom education, giving it the name ‘Critical Language Awareness’ (CLA). CDA has also been a major contributor to the field of critical literacy as a whole.

The first chapter in this second section, David Hyatt’s ‘Applying a Critical Systemic-Functional Literacy Frame in a UK secondary education context’ (Chapter 6), offers a detailed framework for the analysis of text to reveal critical patterns. He provides a step-by-step procedure for text analysis in the classroom, including grammar (e.g. pronouns, tense/aspect), semantics (e.g. metaphors, presuppositions) and context (e.g. audience). Using this, Hyatt has built a critical analysis frame based on the SFL model. For each stage of his analysis frame, he refers to the theoretical bases in mainstream SFL. He not only includes core SFL areas of grammar, but also aspects from newer areas of SFL, such as Appraisal Analysis and Multimodal Analysis. Hyatt’s frame has been developed specifically for use in education, by students at secondary level. It is intended to be easily applied by students, and allows them to make explicit the strategies speakers and writers use as they represent situations and their social actors (van Leeuwen 1996). The frame is being tested with teachers, teacher-trainers and secondary-school students in a project at Sheffield University’s School of Education, and the author is working on its application in the area of citizenship teaching.

Another type of discourse analysis, Appraisal Analysis, has its roots in ‘The Write It Right (WIR) Project’, run in Sydney during the first half of the 1990s. WIR was oriented towards improving language education
practices in secondary schools (see Veel 2006). The project produced many innovations, and one of the most important was Appraisal Theory (Martin 2000; Martin and White 2005). At that time, the SFL model had not developed the affective analysis of text: the recognition of the speaker’s expression of attitude towards participants and processes within the text, or of attitudes assigned to participants within the text with respect to other participants and processes. One reason for this lack is perhaps that the markers of affective language are not located in one particular unit within a Hallidayan model. Appraisal can be realized in terms of lexical choice, but can also be dependent on combinations of words within a clause or phrase. Appraisal can also be realized through the decision to express rather than suppress information. Despite this complexity, White and Martin have developed a coherent theoretical framework for analysing expression of Attitude. A second component was added for analysing the scaling of attitude, called Graduation. During this time, White was working on a related area: how the writers of news articles align or distance themselves with respect to other voices they include in their texts. This area was built into Appraisal Theory under a third branch, called Engagement. Analyses using these systems of ATTITUDE, ENGAGEMENT and GRADUATION provide a way of making attitudinal meaning of different sorts visible, allowing explanation and debate around this very often elusive aspect of texts.

In recent years, investigation has been underway applying Appraisal Theory in the classroom, both to improve the teacher’s assessment of student work, and also through the explicit teaching of Appraisal Theory to students to help them improve their own work, and to assess the work of others, which, in essence, amounts to the application of Appraisal Theory as a form of CDA.

Four chapters show how Appraisal Theory can be applied in education. Development of control of the resources for appraisal goes on throughout the different levels of education, as Bev Derewianka shows in Chapter 7, ‘Using appraisal theory to track interpersonal development in adolescent academic writing’. She analyses texts written in history classes from early secondary up to university level, illustrating the progression students make as they respond to changing demands in the curriculum. Derewianka demonstrates how the more mature texts have moved away from the encoding of direct personal response to more objective and less explicit evaluation, based on social norms. She also demonstrates how older writers are developing awareness of other points of view, bringing other voices into the text and recognizing multiple points of view in their readership, as they learn to argue around propositions, rather than judge a person, group or event from a personal perspective.

In a similar line, in Chapter 8, ‘Appraisal in expository texts: insights and pedagogical implications’, Elizabeth Swain shows the strength of Appraisal Theory analysis to do away with the myth of objectivity, which, at the same time, is in contradiction with the requirement of persuasiveness in pedagogic materials for academic writing. Again, she is able to make
explicit the reasons for the evaluation of students’ texts, this time written in English as a foreign language by Italian university students. She gives a very detailed analysis of appraisal resources in two student texts, showing the key role of the subsystems of ENGAGEMENT in the construction of a coherent academic argument, and proposes an approach to the problem of teaching academic discussion and argument.

Chapter 9, by Susan Hood, again applies Appraisal Theory, in this case to communication among researchers. Her chapter ‘Arguing in and across disciplinary boundaries: legitimizing strategies in applied linguistics and cultural studies’, shows how different disciplines apply appraisal resources differently, arguing that smoother cooperation across disciplines requires academics to be aware of differences in appraisal style. She applies appraisal analysis to the introductions to two theses, one from Applied Linguistics, the other from Cultural Studies, showing the former to be more explicitly knowledge-focused in its appeal to other work in the discipline, the latter to be more knower-focused and based on shared knowledge inside the field. Hood leaves us with the question of how disciplines with different epistemological bases can communicate together.

In Chapter 10, ‘On the “internal dialogue” between an examination task and pre-university students’ responses’, Bodil Hedeboe applies a combination of Appraisal Theory, and work on genre theory (specifically work by Eggins and Slade 1997) to answer the questions raised by her analysis of Swedish students’ responses to a written task in their school-leaving examination, and, again, finds it possible to reveal the criteria for what might seem surprising evaluations by raters. Her analysis of the task set in the examination shows that, though the students were told to write an argumentative text, many linguistic features of the prompt led students to produce a text in the gossip genre rather than an academic argument. However, maturity in writing was recognized by the examiners in the register features of the written mode (Halliday 1989) of the more successful of the responses analysed. Hedeboe calls for explicit teaching and training in features of genre both for students and for their examiners.

The final chapter in this section on discourse analysis is Chapter 11, by Inger Lassen: ‘A discourse analytical study of decontextualization and literacy’. Lassen’s chapter is more purely SFL than the previous studies, drawing on core SFL resources: genre, register, etc. to highlight problems of communication in academic communication. Even inside a discourse community – in her case, of scientists working in protein chemistry, specifically on the genetic make-up of a variety of potato – texts may be inaccessible to those who do not belong to the same small ‘community of practice’, once such texts are taken out of their original context. Lassen finds that implicitness is a feature of both the Methods section of the article and of the lab account she analyses. This means that these texts are not accessible to those outside the immediate group of scientists working together on the experiment, despite the supposed function of facilitating replicability of scientific reports.
4 Corpus linguistics and education

Computers have brought new challenges to education by providing us with new kinds of texts. At the same time, the power of the computer has given us new means of dealing with this new complexity. We now have available electronic corpora, large digital collections of texts, and tools to explore the corpora for text instances.

The most important way in which language education is being affected by corpora is that our very understanding of language is changing. Sinclair (2004), for instance, after a long career working with corpora, came to believe that reading is more idiomatic than constructive: it is more a matter of interpreting semi-fixed sequences of words than it is of making meaning one word at a time.

This volume includes two chapters exploring new views on the nature of language when seen through corpora, and the consequences for these views on how language should be taught. First, in Chapter 12, Gordon Tucker’s ‘Exposure, expectations and probabilities: implications for language learning’ argues that while we may be able to construct infinitely many sentences, in practice, we typically use a far smaller set of wordings:

There is thus a set of social meanings, conventional ways of seeing the world, that populate the very heart of most social interaction. And this is premised on the claim that speakers, when they endorse a ‘meaning’ and adopt it, are more likely to express it in an identical or closely similar way to the way in which they have regularly encountered it, rather than seek some novel form of expression for it. (Tucker, this volume)

He argues that particular combinations of words occur statistically more often than others, and that an intuitive sense of these probabilities (based on exposure) are an essential part of our language ability. Thus, to properly teach a language, language educators need to raise language learners’ awareness of probabilistic expectations of language forms.

Susan Hunston, in Chapter 13, ‘Grammar patterns and literacy’, goes even further, arguing that large-scale corpus work pushes on towards viewing a sentence as a linear sequence of semi-fixed phrases, which mesh together to form the sentence. She argues that readers only take recourse to word-for-word interpretation of a sentence as a last resort, when no phrasal, idiomatic pattern applies. If language teaching is to exploit what we know about how native speakers process their language, then such teaching should be based on a grammar which supports this analysis. Hunston describes this Pattern Grammar – which Gill Francis initially formulated, and Hunston developed – as viewing the construction and reception of sentences in this way. Using Pattern Grammar for teaching reading may well change the nature of language education.

5 Summary

This book, then, brings together the work of language educators and researchers of language who are developing new ways of looking at ‘text’,
or applying the recent advances in language analysis within language education. We have tried to organize these works into a coherent framework, distinguishing three areas of development: multimodal analysis, discourse analysis and corpora. We hope the book as a whole offers a useful resource to all those involved in education who are trying to understand what these new directions can take, or, for those already working in them, offering some new ideas to enrich their practice and research. Ultimately, the voices of the educators and researchers who have contributed to this project, along with those of the learners reproduced in their chapters, offer new ways of understanding and of raising awareness as to the shape of language as instance – that is of language often working in conjunction with other modes of representation – and of language as system, an understanding which we feel is more and more necessary in today’s complex society.

References


Part I: Multimodality and Education
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1 Meaning, Learning and Representation in a Social Semiotic Approach to Multimodal Communication

Gunther Kress

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1 Introduction

I have a special interest in how children make sense of the changing world of representation, as a way of gaining understanding about who we are and can be in this world. I went to school in the late 1940s and early 1950s and in relation to that then very stable social world – socially stable despite the cataclysmic events of World War II – what is happening now is a huge change. But if you are 8 years old now, then what is happening is simply what is happening now. It is not unusual; change is not the issue. One big problem for children now is that many of those who teach them live in a world differently experienced to the world which the young take as their normal world. In that sense it is we who are the problem for them, more than the world itself being the problem for these children.

I think of that change from the older to the newer world of representation – a revolution really – in terms of two changes; the first is a change in media, that is, in the means we use for disseminating our messages. Here the fundamental change has been that the cultural and perhaps mythic dominance of the book has given way to the cultural and mythic dominance of the screen. The second change is in terms of mode: the means we use for making representations. The cultural dominance of writing is beginning to be challenged in many and different sites of public communication by the increasingly prevalent mode of image. These two changes are taking place simultaneously, each amplifying the effects of the other. On the one hand, the book is giving way or has already given way to the screen and writing is being challenged in very many sites by the increasing prevalence of image. This is not to say that there are not more books being
published than ever before, but to say that the book’s cultural, mythic place has shifted.

This chapter explores the effects of the shift in modes of representation in terms of how we learn to make sense of the world. This shift, in turn, is everywhere affected by, connected with, and itself affecting (relations to) authority, which itself has come to be more widely dispersed. In educational settings, however, this is not always recognized, considered or reflected in social relations in the classroom – in pedagogy. All of this needs to be located in the environment of wider social, political and economic changes – the necessary environment for considering these issues – and of course also of changes in technology. These economic, social, political, technological changes are factors in globalization, a vague term which points to a complex reality.

If the frames of values and meanings, which the former stability of nation states had provided for us, are beginning to fall apart and disappear, then, however much we had objected to them, at least they had given us stable frames with which to engage and to critique. In very many societies around the world such stable frames are now missing. In that context, even though the children in our schools find the world in which they are their perfectly normal world, that world is unusual in that it is a world without shared or understood frameworks, including ethical frameworks. I am not going to argue for a specific framework of ethics but rather for a debate on and elucidation of ethical principles, what I have called ‘navigational aids’. Neo-liberal, post-modern societies and states do not, cannot and actually often do not wish to provide these.

Before looking at the changing modes of representation and the effects of this on society and on learning, I trace my path towards an interest in multimodality through Michael Halliday’s linguistics, especially in terms of the materiality of speech and writing. I take this as a point of departure towards a social semiotic theory which, in order to provide an understanding of the range of meaning resources available in a culture, ultimately needs to go beyond an account of language alone.

2 Multimodality, social semiotics and the linguistics of Michael Halliday

Both the semiotic and the multimodal aspects of my current thinking and writing connect to Halliday’s earlier work on the characteristics of language-as-speech (Halliday 1967, 1984; Kress 1976, 1982). When Hodge and I were thinking about the title of a second book (Hodge and Kress 1988), we tried a number of possibilities which linked our intentions at that time to our earlier Language as Ideology (1979); finally, we picked up on part of the title of Halliday’s Language as Social Semiotic (1978). Without having the label at that time, his work was for me also multimodal in essential characteristics. It was semiotic in that the process of realization is one which fuses a meaning with a form to produce a sign; social in that it is the social environment in which the processes of choice from the potential
of options takes place; and multimodal in that there is a taken-for-granted – if maybe implicit – emphasis in that work on the materiality of speech, rather than on abstractions such as the ‘language system’.

At the same time, there was an explicit recognition that this difference in materiality had semiotic effects and consequences: speech, in that work, has different potentials for meaning than does writing, due to its culturally worked materiality. The fact that the term sign was not used at that time in Halliday’s writings is, in that respect, neither here nor there. So even if in some part implicitly at that time, speech and writing were treated as distinct both in their meaning potentials and in their realizational form, in my terms now, they are two distinct modes.

Speech uses the material means of sound provided by the ‘voice’: energy for instance (as loudness), pitch-variation (as intonation), breath-units (as textual entities), and these become shaped by speakers in their culture into a semiotic resource with particular characteristics. So in some languages the affordance of pitch-variation (as tone) is used largely for lexical purposes; in others, such as English, it is used for grammatical/semantic ones. The breath-unit, a (relatively) ‘natural’ unit, becomes a textual unit; and with the addition of pitch it becomes the intonation unit. The intonation unit in its turn is identical materially – though not semantically – with the information unit. That is, culturally shaped material substance – the intonation unit – is fused with meaning to make a semiotic entity, a sign: the information unit.

In this approach to language, the sign is a social semiotic entity, because the process of realization, the move from meaning to form, the work of using the resources of the language for making meaning, is based on choice, that is, contingent action by the speaker in a social environment with its demands and requirements and in the environment of the resources of ‘the language’ which offer the possibility of choosing and thereby of acting differently. The specific choices made represent the social semiotic work of the speaker, having chosen to realize this meaning in this form as the best possibility offered in this situation. In other words, it is the agency of the speaker in a specific social situation in the environment of available semiotic resources, whether those of speech as here, or of others, which leads to this sign rather than another. This semiotic work realizes the interests of the speaker at this point. Semiotic work, like all work, is always significant and meaningful.

Writing offers a quite different range of semiotic means to those of speech. While lexis and clause types may be, broadly speaking, common to both, there are other resources, for instance, the sentence when it occurs in speech it does so as a kind of quotation – as in the speaking of writing-like forms.

In other words, if one starts from the material aspects of representation and communication rather than from abstractions such as the language system, grammar, syntax, etc. the quite profound differences between speech and writing are clear, and while the two appear in some ways as related, in
other ways they are distinct. Following from that, in my own thinking and writing I now treat them as distinct modes. If we do begin thinking about representation and meaning in terms of (culturally/socially-shaped) materiality, then the notion of ‘language’ quickly appears as an untenable abstraction, with a specific problem: it may be that there is more that differentiates speech and writing than there is that unites them. I now think more in terms of the distinct affordances of the modes of speech and writing. If one takes that step – and not only for speech and writing but also for image, gesture, etc. – then the question becomes one about the general semiotic principles by which we might describe the similarities and the differences of all the modes which are available and used in a culture for the making of meaning.

This implicit and explicit distinction in Halliday’s writing in the mid to later 1960s began a train of thinking for me about the real distinctiveness of speech and writing (see e.g. Kress 1982), and in many ways led me to an openness towards exploring the specificities, the potentials and the affordances of other modes of representation.

3 Features of a social semiotic multimodal approach to communication

The concept of multimodality is used across quite different areas: in biology, in medicine and in what might broadly be called the human and social sciences: in psychology (Sadoski and Paivio 2004), in anthropology/ethnography (Goodwin 2003), as in communication studies/semiotics. The use of the concept by itself has some theoretical consequences, above all in challenging the assumed centrality and significance of language in general and of writing in particular, in ways specific to the discipline involved. In mapping out a new field of intellectual work, or in redefining an existing field, theoretical consequences are inevitable. However, it is important to realize that multimodality of itself does not name or specify a theory: it names a domain of enquiry.

Two quite distinct versions of multimodal description and analysis have been developed from within Systemic Functional Linguistics (SFL), that of O’Toole (1994), and that of Kress and van Leeuwen (1996). The two differ in their relation to systemic functional grammar. In the one case, the linguistic model is taken as an appropriate model for the description of other semiotic forms – buildings, sculptures, images, etc. In the other case, the general semiotic principles which underlie that linguistic theory are taken as a common basis and a point of departure. This approach leads to the need to develop descriptive/analytical terms which are apt for each mode, in line with the characteristics – material and cultural – of specific modes. So the mode of speech for instance, with the materiality of sound, and with time and sequence in time as its governing logic, is treated as differing fundamentally from the space-based mode of image, with a materiality of surface and graphic marks, and space and simultaneity as its governing logic.
In the second approach, both the connection with and the distinctiveness from linguistic forms of description, as of descriptions of other modes, exist at a quite general level of semiotic features, at a certain level of abstraction. These general semiotic features have realizations which are mode specific: they may be realized more or less similarly or entirely differently at the level of the specific mode. So for instance a general semiotic feature such as prominence might be realized in the mode of image by colour and colour saturation; in sound by loudness; in gesture by the spatial extent of the gesture-sign – that is, in each case by material means which can realize ‘high energy’, leading in each case to the semiotic feature prominence, but very differently. As another example, the semiotic feature framing is realized in writing by punctuation marks, paragraphing, spacing; in speech by intonation contours, by pauses, by rhythmic features; and so on.

In what follows, I explore aspects of representation, and its effects on meaning and on learning. I am particularly interested in three questions: 1) what is it that we learn when we learn to represent; 2) what do we learn when we learn to use the different modes of representation; and 3) what do we learn when we learn to represent in situations of conventionality and of power?

4 Representation

Let us take a look at what we learn when we learn to represent. When we learn a script system, what is it we actually learn? My example comes from a research project that a colleague (Charmian Kenner, see Kenner and Kress 2003; Kenner 2004) and I did some two years ago. The question we had posed was ‘what happens, what kind of sense do children make when they learn two script systems at the same time?’ In a London school you might have children from Hong Kong or from somewhere else in the Chinese-speaking world; during the week, they attend a normal English primary school. There they learn English, and they learn the script system of the Roman alphabet. But on Saturday they go to Chinese school and there they learn the character-based script of Chinese. In the project we also looked at Arab-speaking children (and, just for interest we also looked at another version of the use of the Roman alphabet, namely that of a Spanish speaking group, from Colombia).

Our question was: what sense are these children making of these differences? One methodology we used to try to understand this was to ask these 5 and 6-year-olds to teach their English speaking peers – in their English primary school – how to construct a character, or how Arabic writing works. In listening to and looking attentively at their teaching, we hoped to understand what sense they had already made for themselves – explicitly or implicitly – of the two writing systems.

Figure 1.1 shows the result of Selina, who was at the time just 6, learning to make a set of characters. The page is set out with squares. Selina starts
on the top right-hand side, as in conventional Chinese writing the characters are written in columns which go from the right to left. In making a character, you learn to adhere to a strict sequence of strokes. As can be seen in Figure 1.1, the set of characters has about 8-odd strokes; you learn to make them in a sequence which is absolutely fixed and cannot be changed. So one thing you learn as a matter of course is strict adherence to order (as sequence), although no attention is being drawn to that as a great matter of content. Thus, you learn that when you represent there is an order, the order is fixed and cannot be waived, it cannot be changed. It is taught explicitly, although its social-individual effect is unspoken; it is

Figure 1.1 Selina constructing a character
naturalized. The subsequent columns show Selina practising the set of characters a number of times until she had filled all the squares.

This teaching of order brings with it what I might call a social epistemology. A further point is that whereas when you learn the Roman or the Arabic alphabet, you learn to write on a line, when you learn to write a Chinese character, you learn to place it, perfectly balanced, in a square. It has to be centred perfectly; and so what you learn about the world, again implicitly and as naturalized, is that things exist in perfect balance in a square.

In learning this script system you learn how to see the world – elements as perfectly centred in a square, and as strictly ordered. After the first stages of learning to make characters, the squares disappear from the surface of inscription – the paper, the blackboard. Yet they remain as an inner semiotic resource.

Once you have learned the script system, then when you look at the world (and maybe not just the world of script), you see what you wish to represent in one case in terms of its place on a line and in sequence, and in the other case in terms of its place centred in a square and in terms of inflexible order. These are deep logics, of sequence and development on the one hand and of balance and centrality on the other. If you learn to write on a line, of course there is a requirement to keep going along the line, one letter after the other, so as to ‘achieve’ a word (seen as a sequence of letters; see Figure 1.2). The metaphor of ‘development’ – or at least a particular version of that – inheres in the learning of alphabetic script; and it becomes naturalized. There is not, I think, a similar urge to move along a line when you have learned to place your character perfectly balanced in the square. In each case quite profound dispositions become naturalized.

In the project we had a telling example of the lasting effect of the square, when another young person was teaching some of his English-speaking peers at a blackboard and got very cross with them. He said, ‘No, you are not placing the character in the square’. We looked at the blackboard and saw no square. But he had seen ‘the square’ on the board. When we looked harder, we saw that maybe 10 or 15 years ago it had been a squared board, used for writing numbers. Over time, the marking had been rubbed off; he could see the squares because he was looking for squares in the world into which to place the character. This is an orientation in and to the world which is fundamentally different to learning to write on the line. Writing on a line has equally profound consequences – hence my comment about ‘development’. What you learn when you learn

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**Figure 1.2** Alphabetic writing
to represent is to engage with the world which your culture has made for you, and you learn to engage with the cultural material in quite specific ways. Of course you transform that constantly, you are never simply copying or imitating. But you transform it, as in fact Selina had done, in line with the ‘templates’ your culture provides.

These things are deeply entrenched and widespread in the culture, and they do not remain confined to the writing system. In front of me I have the image of an advertisement, not from China but from Japan. In the image the bottle of Soy Sauce and the writing around it are not placed as they would be in a Western advertisement; rather, they are central. The centre has a particular place in East Asian representations, and it is of a piece with the place it has in the writing system. These semiotic characteristics are widely ramified. When you learn to represent, you learn a whole orientation to the world – certainly to the cultural world, but maybe also as a means of semioticizing the natural world.

I take that as a metaphor for looking at all aspects of semiosis, in all modes. When you learn to represent, no matter what it is that you are representing, these are the kinds of things you are learning: how your culture has already worked with material; you engage with that and in engaging with it you are learning things which are hidden because they have become naturalized.

5 Shifting worlds of representation

What does the older and the newer world of (Western) representation look like? A metaphor I use is the comparison of the front-page of *The Times* from 40 years ago with one that is contemporary. When I show the image of the 1959 page in talks and ask the audience to guess at the period from which it comes, the answers tend to be ‘about 100 years ago’. The page is covered in writing, the font size is very small, arranged in quite narrow columns: the clichéd image of someone reading this page with a magnifying glass captures what reading that page meant: concentrated effort, work. Forty years on, the world of representation – in the front pages of English (and other European) newspapers looks very different; and the front page of *The Times* is no exception. There is colour, there are (photographic, usually) images in colour, the font is larger, the lines more spaced, there are (compared to the earlier version) very few ‘stories’, the layout is entirely different.

This represents a profound social as well as semiotic shift, given that the ‘engagement’, the mode of reading that goes with each of the two pages, is a very distinct engagement. Reading the former page takes energetic, concentrated, sustained *work*. Reading is *work*. In the later example, getting information from the page is of course also (semiotic) work, but it is different. There has, in the intervening period, been a shift from the world of work to the world of entertainment. Of course this was and remains a paper for an elite; yet the shift is in many ways quite as pronounced in a
paper for ‘the masses’. The contemporary tabloid has ancestors which had a significant amount of (black and white) image on the front page, though nothing like the use of image of contemporary tabloids. Nevertheless, it is clear that in both cases what is at issue is a different kind of work: a shift, which in each case might be characterized as one from work to entertainment. The contemporary versions are lighter in their demand on the reader, more pleasurable and are meant to produce a quicker ‘return on effort’.

This shift in the world of representation is one we cannot afford to ignore, because one is the world which is normal and usual, entirely ordinary, unremarkable, for young people in school. It is the world as it is. The other is the world of those who still make the curricula and devise pedagogies, who still have in their minds and want to bring into the school that other world as the world which is, and therefore ought to be learned. If you do want to see what the textual world on the page is like for 10-year-olds (or children even younger) go to any newsagent and look at, say, a Playstation magazine (see also Chapter 3, this volume, for analysis of children’s magazines). Writing is there, but image is entirely dominant: that is where attention focuses, much more than it does on writing. Attention to image has superseded attention to writing; and modes of reading of the older forms (see below) are different to the mode of reading here.

Figure 1.3 The Boy Electrician
I will demonstrate briefly how we might think about the shift from the page to the screen and from writing to image, through a focus on modes. Figure 1.3 shows a page from a book called *The Boy Electrician*, which was first published in 1926.

How did this page and this book work? The author had laboured to assemble ‘knowledge’, which he knew was useful for boys. As he said in his preface, a 7-year-old will naturally be interested in electricity. So the author knows a lot about the subject and he also knows a lot about the audience, sufficient to be able to say with confidence that the knowledge which he has assembled will be suitable and useful for the audience for which he has assembled it. The chapters are ‘chunks of knowledge’, each a coherent entity of knowledge, and they are arranged in sequence. As readers, our task is to follow the order which the author has laid down for us. The pages of the book look as represented in Figure 1.3. You read by starting at the top left, you move along the line until you come to the end of the line, where you return to the left of the next line. The reading direction and therefore the order in which you read is given. Your task is to follow that strict order. You cannot change it. You cannot read backwards or across. Of course readers do scan; but if you want to get the knowledge presented here, the task is to follow the given order.

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Figure 1.4 Home Page of IoE
However, when it comes to the elements which a reader encounters along this strictly ordered line, we need to ‘interpret’, because words are relatively ‘empty’, vague entities. They are not filled with meaning. We, as users/readers, fill them with our meanings. The task of reading is one of following a strictly given order, interpreting the entities which we encounter along the line.

By contrast, in looking at the home page of the Institute of Education (Figure 1.4) we see a total difference. Until about ten years ago the institution had a certainty about its audience. What has happened is that now there is no longer any real certainty about the audience: for one thing the institution now operates in a market, where until about 20 years ago it had operated in a command economy, organized by the State. In the market you attempt to attract people – consumers – with the things that you have to offer them, even if you may no longer quite know who these consumer/clients are and what needs, problems and desires bring them to you.

The home page in Figure 1.4 does not have a single point of entry. A single point of entry corresponds to knowing who the audience is, what its needs are and what it should do. This page/site has 13 points of entry. Each point of entry corresponds to a quite different assumed configuration of interests on the part of the audience. Socially speaking this arrangement corresponds to a nervousness about who the audience for this textual entity is. It is configured in different ways; what it does not do or say is ‘here is authoritatively constructed knowledge’. It says ‘here is information which, in relation to the world in which you live and the needs which you have in the world in which you live, you can configure in relation to those needs and transform it into the knowledge that you’ll need as a tool to solve the problems in your life-world’. It is not any longer the confident ‘we will give you knowledge because we know who you are and what you need’. It is saying ‘here is information which you can configure in relation to the needs which will arise in your life’. This is a very different approach to a group of people whom until recently the institution regarded as its students, though now more often called clients or stakeholders, signalling the difference in social/economic relation. The task of communication has become a very different one. Nervousness has replaced certainty in the move from the certainties of the state and its institutions and the way it placed individuals as citizens or as labour in employment, to relations in the market; with that has come instability and insecurity represented literally in the structure of this message.

6 Shifting modes of representation

The question then becomes: does it matter if we shift from writing to image? Is it simply a change from one mode of representation to another, or is there something fundamental at issue? There are, as far as I can see, fundamental differences between the logic of speech and the logic of image.
That is, with the logic of modes which are time-based – speech, music, dance, gesture – we have to say or do one thing at a time, and we make use of sequence in time for making meaning, while in image-representation we use display in space for making meaning. If therefore we shift from the one logic to the other, there are going to be profound changes in our stance towards the world, to how we make sense of the world.

The underlying logic of speech is that of sequence in time. When I speak, I have to say one thing at a time, one sound at a time, one word at a time, a clause at a time, or a sentence at a time. I have to say things in sequence. The possibilities of sequence give me the means of making meaning.

Here are two very simple examples. If I say ‘George married Amanda’ it means something different to ‘Amanda married George’, in two different ways: one, because the noun which comes first in that kind of structure tends to be read as agentive. In the social world as it used to be the former utterance was more likely, more ‘appropriate’; in the second, it is the world as maybe it is now, where women can act agentively. But secondly, the difference in sequence also codes perspective. It may be that I am socially or affectively closer to George than I am to Amanda, or vice versa. And so I place George or Amanda’s name first depending on my closeness to the one or the other.

If I have two clauses: ‘the sun rose’ and ‘the mists dissolved’, then if I place them in one order:

\[ \text{The sun rose and the mists dissolved} \]

I get one meaning; if I invert that order:

\[ \text{The mists dissolved and the sun rose} \]

I get a quite different meaning. The first reports an entirely ordinary event: the sun comes up, it gets warm, the mists go. By contrast, the second has a magical, mysterious feeling: not that of our ordinary world.

The affordance of sequence is used to make meaning, in speech or in writing. In both cases a notion of causality is implied, whether I like it or not. I cannot avoid sequence and with it a causal reading. The other meaning is that of perspective: again, unavoidably so.

This is what I mean by the logic of modes. I cannot avoid these affordances. Further, in writing as in speech I have to lexicalize whatever I wish to represent; whether I use a clause or a sentence, I have to lexicalize action; I have to state that there is an action or a state which involves nominal or other entities in some way. Each mode forces me into specific epistemological commitments.

By contrast, when I represent through the logic of space, something quite different happens. Figure 1.5a is an image made by a 4½-year-old girl, Georgia, from Brazil. It is about ‘me and my family’. I want to show how she uses the potential of spatial organization to mean something about herself in her family.
Figure 1.5a Georgia

Figure 1.5b Georgia
What meaning is made here through the spatial relations of the three major depicted entities? If we ‘read’ the meaning of this, we would say, ‘OK, she has placed herself by the side of her mother, maybe because she feels closer to her mother than to her father’. She has also represented herself as being of a particular height, which may be relatively accurate physically or it may be accurate emotionally. In other words, height can be used as a signifier of affect.

If you change the order of the three figures (see Figure 1.5b), in the way that I have changed elements of the two sentences above, you get a different meaning. Now Georgia might be meaning that she feels framed, encompassed, shielded or sheltered, surrounded by her family. This is in fact the image that she had drawn. Difference in form brings difference in meaning.

One thing to say about the images is that neither has a notion of sequence; nor is there a notion of causality. There is no sense of a ‘story’ either, as there is even in the simple case of putting the two clauses together in the example above. A ‘story’ can of course be told about the image or about what is represented – but that is a very different matter. There is no action to name. The potentials and consequences of spatial and of temporal representation are quite different.

7 Modal affordances (and their effects)

I turn now to my second question: what do we learn when we learn to use the different modes of representation? To answer this, I draw from the work of Eve Bearne, who conducted research in a classroom in south London. One day the class was taken on a visit to the British Museum, and on the next day, the teacher asked the children, ‘to draw a picture of our visit to the British Museum’ and ‘to write a story of our visit’.

Figure 1.6 shows one image of the visit. It shows the façade of the British Museum, obviously hugely impressive to the young visitor, and placed against it are depictions of two mummies. Mummies figured in just about all of the pictures. The three entities which were most salient in this young man’s recollection on the day after the visit – the two mummies and the façade – are placed in relation to each other to make a meaning, maybe something like ‘the British Museum and what is in there’. The two mummies are centrally placed, with the façade of the museum as the backdrop/environment. The mummies, both in terms of placement and in size, are represented as equal in their significance for this young man. The recollection, visually, asks: ‘what were for me the salient entities and how do they relate to each other?’ His recollection verbally is quite different:

When I got to the Museum, it looked bigger than I thought. When I went in, I took off my coat and went to the men’s toilet and after that, I ran upstairs, and after I ran upstairs I went into the lift. Then I went to see the mummies and all that stuff. Then we went to our cloakroom so we can get our coat and then we went to Waterloo
Station on a tube and a train to Clapham Junction and walked back to school and went home very happy and I told my mom, sister and brother. The end.

This is about the 'same' world, the same experience, here recollected and represented by using the temporal/sequential affordances of writing (which, at the age of six, leans heavily on the syntax of speech), where before the day was recollected via the spatial/simultaneous affordances of image. But the worlds represented are very different: in writing it is a world of events and actions in sequence; in image it is a world of salient entities in spatial relation to each other, a world of how things are.

This leads to questions of a far-reaching kind: ‘What happens if you become habituated to representing in either of these modes?’ I assume that over time the habituation to one mode rather than to another will come to shape not only the form of representation but also the manner of your engagement with the world, so that you might begin to engage with the world already anticipating the means of representation that you use. If speech and writing are the dominant modes in your culture, maybe you are disposed to engage with the world in terms of salient actions and events, and their arrangement in temporal succession. The implicit question posed by representation in speech or in writing is: ‘what happened and in what order?’ Where image representation is dominant, your orientation to the world is different, even before you represent it. The implicit question posed by representation in image is: ‘what are the salient features of the world and in what relation do they stand to each other?’

Figure 1.6 The British Museum
And so my answer to the question: ‘what do you learn when you learn to represent?’ is that the insistent, constant ‘training’ which comes with the use of dominant modes and their affordances, is that your attention is shaped, and you come to orient to the world in a particular way. That maybe is the major effect of the cultural technology of representation.

8 Social positionings of the reader

This brings me to reading paths and the issue of the ordering of the world, of the world ordered for the reader as against the world designed by the reader. The question posed here is not just about what you learn when you use the different modes, but it is about the ways your social position as a reader is changed in the use of these modes. Figure 1.7 shows a textbook page from the 1950s, like the page from The Times newspaper described earlier.

Here everything that needs to be represented in the relevant world is represented in writing. As in the page from The Boy Electrician, the reading path, the path of access to that world, is clearly given. Of course there may be images on these pages, but in this period and in these books with this subject matter they are ‘sparse’ images – the abstraction of science rules. The function of the image here is what Barthes, writing in the 1960s, called illustration (Barthes 1968/1977). That is, an aspect of something which has already been expressed in writing is now re-presented, this time in image form.

The logic of writing dominates this page; when image appears on the page, it appears subordinated to the logic of writing. This is a clear instance of the world ordered for the reader. Look, by contrast, at the geology page (Figure 1.8), for the same age group, from about 10 or 15 years ago; it looks somewhat different.

The relations of writing and of image differ, compared to the earlier page, as do their relative ‘presence’ on the page, their different uses: not only in terms of how much writing there is and how much image, but also in terms of the functions of each, what writing is used for and what image does. Here writing does not carry the major curricular content, that is the function of image. Here there is a specialization of modes; where image carries the main content and writing is peripheral, marginal, there to provide ancillary information.

That constitutes a fundamental change in representation, related, as I have said, to social changes. The earlier page demands the kind of (semiotic) work which reading The Times had also demanded. That kind of reading – as do all forms of reading – produced a certain kind of subjectivity. The newer page asks for a reading which is much closer to that which a contemporary popular newspaper demands. The shift and the blurring of the boundaries between work and entertainment is present not only in newspapers or in the popular media, it appears everywhere. This science page represents reading for entertainment. There are many reasons for this change; technology is just one of them.
Whereas on the earlier page it was clear how I should read it – and I could not read it otherwise – on this new, contemporary page it is not clear that I should read it in one particular way. I could start with the small captions or with sections of the image; I could start at the bottom of the page. The principle of the electric motor.

The simple electric motor consists of a coil pivoted between the poles of a permanent magnet (see Fig. 63). When a current is passed through the coil in the direction indicated in the figure we can show, by applying Fleming’s left-hand rule, that the left-hand side of the coil will tend to move down and the right-hand side to move up. (Remember that the direction of the field due to the permanent magnet is from the N. to the S. pole.) Thus the coil will rotate in a counter-clockwise direction to a vertical position.

Figure 1.7 Science textbook page
I could start pretty well anywhere. It is my interest, and my ‘disposition’ which leads me to read this page in a particular way. This manner of reading pages is quite new. Among other things, I am asked to bring the meanings made in two modes together into a joint, coherent reading. Here one mode with its meanings is relatively peripheral and one mode with its meanings is central; each is functionally quite different. This is an instance of new forms of reading – where I as reader make the order of the whole text for myself. Just as consumers in the market society have been dislocated from the structures in which they had existed before (work/occupation; social roles/status) and now

Figure 1.8 Geology: cross-section of the Earth
operate on and define themselves on the basis of their choice/taste/disposition, here, in a sense, the reader has also been dislocated from the structures which had been there before – of canonical mode, of mode and content relation, of genres – all simply taken for granted before.

In principle, here the child readers are invited to make the textual order which corresponds to their interest; that is likely to be a different interest in each case and therefore a different order for different children in the same classroom. I say in principle because there is the teacher and the demands of other authorities which act on him or her.

That is what I mean by ‘the world ordered for the reader’ as against ‘the world designed by the reader’. It represents a shift in (representational) power from author to reader – long since foreshadowed by Barthes (1968/1977) in his essay on ‘The death of the author’ – a shift which mirrors changes in social power, which themselves correspond to changes in structures of power from the state and its institutions, of what the state had expected me to become, from education for citizenship and labour, to education for and via the market, education for consumership and consumption. Now the relevant structures are the demands and the desires of the market, demands not now as or for a citizen, nor as somebody who will fit into the workforce of the national economy, but now as a consumer, an object of competition, contested over by the market.

Authority had been bestowed on and come from the figure of the author, who had the right to produce knowledge and pass it on to us as legitimated knowledge. That kind of authoring and authority is now dispersed, so that every reader is a kind of author, as in Barthes’ essay. Authoring now is very different. As with the home page of the Institute of Education, so with the websites of airlines, where you construct your ‘text’ from the resources available on the site/page. These pages offer commodities as resources: ‘You want to go to Paris? You want to go to London? When do you want to go? How much do you want to pay?’ You are the author. Your desires govern the text which you construct. Authorship is no longer rare; for those who have access to the new media, authorship has become usual, common. When authorship is common, authority disappears. When everybody can be an author, authority is gone.

9 Power, assessment and learning

Whereas in the past knowledge had been assembled for me by somebody who had the authority (and the assumed understanding of my needs) to do so, now it is I who understands the demands of my (life-world) world, the world in which I am located; I know my needs and am aware of the resources that my culture, my society, makes available for me to construct the knowledge which I need as a tool to solve the problems which exist in my life-world (Böck 2004). That is an inversion of the former relation of authority, power and knowledge; it is a profound change. Of course the world is not uniform in that respect. In some places it is still more as it was
and in others past arrangements have nearly disappeared. It is a mixed picture. At the moment Britain is privatizing parts of the military. The market can come to govern everything, and the state can become residual.

At this point, my third question is: ‘What do we learn when we learn to represent in situations of conventionality and of power?’ Children show their interest or their desire in how they represent. The supermarket invites us to do the same. The shopping trolley full of commodities is one representation of myself. But our representations are produced in environments marked by power, and this has an effect on assessment. I can fill my shopping trolley, but the rejection of my card at the checkout is a telling assessment of me. Assessment, both in the narrower sense of assessment in school, but also assessment in the much wider sense of sanctions, effects and consequences of our actions anywhere, represents the exercise of

Figure 1.9a Plant cells: brick wall
power. Assessment is the result of the constant, inevitable, usually invisible judgement by others of us and our actions in relation to conventions in society at large.

My last example comes from a research project ‘The Rhetorics of the Science Classroom’ (Kress et al. 2001). A class of 13-year-old young women are learning about plant cells. The conventional method – in English Science classrooms – is to take an onion, pull out the thin epidermis between the fleshy layers of the onion, place it on a glass slide, stain it with iodine, put a glass slip on top, and then put the slide under the microscope, and look through the eyepiece to see what is there. In this case the students worked together in groups of four to prepare the slide, examine it and then report on the experiment. The teacher had told them that they would be asked to write – individually – what they had done: ‘I would like

Figure 1.9b  Plant cells: eyepiece
you to draw what you saw and to write what you did’. And: ‘Two things: I want you to put your writing at the top of the page and the drawing at the bottom and I do not want you to use colour pencil’. Colour pencil was banned because colour belongs to the aesthetic, not the scientific domain; and the injunction against putting the drawing at the top expressed the teacher’s worry that the children might do a big drawing and not leave enough room for the written text. Figures 1.9a and b show two (of the four) texts produced by one group of students.

Four lessons had preceded the experiment, and provided the ‘materials’ for the texts here. There had been much talk by the teacher, there had been the use of textbooks, of handouts, and then much talk by the students as they were preparing and conducting the experiment. One handout stated ‘Look at the slide under a microscope. It should look like a brick wall. Each brick is a cell’.

In the text shown in Figure 1.9a, the student had placed the drawing at the top. The written part of the text was in the genre of a recount. The other young woman, looking at the same slide, through the same microscope, had put her drawing at the bottom. The drawing (Figure 1.9b) is an empirically close representation of what she had seen, including the tracing of the eyepiece. The written part of her text (1.9b) is in the genre of a procedure: step one, step two, step three.

In the students’ responses to the task two quite distinct things are being represented: 1) what do plant cells look like? 2) what is ‘scientificness’, and how is it represented? In Figure 1.9b, the writing suggests that scientificness resides in following a strictly set out process. According to the drawing however, scientificness resides in being meticulously true to the empirical reality revealed by looking through the microscope at the slide.

In the case of Figure 1.9a we have a different account. The writing suggests that scientificness resides in the accurate recount of what went on: ‘First Amanda and I collected all the equipment...’. Unlike the genre of procedure, which states what should be done, the genre of recount represents those events which are crucial in this experiment in the order in which they happened. The drawing responds to the handout’s suggestion ‘what you should see should be like a brick wall. Each brick in the wall is a cell’. This young woman has followed the implicit suggestion of the handout, namely that theory tells you how to see reality.

Each of the students attempts to account for what is theoretically real and what is empirically real. In Figure 1.9a, it is a conjunction of the theoretically real via the drawing and the empirical real via the writing: strict adherence to theory reveals the truth in the drawing, and a precise account of the empirical real reveals the truth in the recount. In Figure 1.9b, it is a conjunction of the theoretically real via the writing and the empirically real via the drawing.

So while at first glance the two texts look and seem quite unlike each other, both are actually alike in that both see scientificness as the
conjunction of being truthful to the empirical real and truthful to the theoretical real.

In my view what we see here is evidence of these young people’s learning. The question that arises is ‘How do we assess this?’ The teacher was clear. His written comments were ‘The diagram needs to be much larger. Did what you saw look like my diagram in any way?’ In other words ‘you did not do what I asked you to do’. On the other text he wrote: ‘What was the magnification? Can you label any of the parts?’ While his attention was drawn to the images, he did not treat them as sources of evidence of learning, except in the most superficial sense. His main attention went to aspects of the curriculum that he had in mind rather than to the question ‘what principles did the students apply in their conduct of the experiment and in the completion of the task?’

The teacher’s attention goes to what I regard as ‘authoritative knowledge’, which the children were meant, as faithfully as possible, to ‘take into themselves’, to acquire. It is the operation of assessment of learning as an assertion of social power. But we could look at it differently, and say: ‘OK, there were four lessons, a lot of material had been presented through books, through actions and through experiments. From all of these materials these young women made selections. When they worked around the microscope there was a lot of talk, in which they commented on what they were doing and out of all of that they made their representations’. And we could ask a different question: ‘What principles did they apply in their selections and in their re-presentations of the materials that they had had access to?’

It is possible to see learning as the individual’s agentive selection from, engagement with and transformation of the world according to their principles. If we were interested in studying learning of this kind, assessment would attempt to understand the principles on the basis of which they had made their selections, and attempt to uncover what principles they had applied in the transformations of the materials they had selected. That might provide means to understand what the students had learned, rather than saying: ‘These are imperfect copies of the knowledge which you should have acquired from me, given my authority’.

In other words, we can choose a theory of learning – and consequent forms of assessment of learning – which attends to the meaning of those who have power, or we can develop theories of learning – and consequent forms of assessment of learning – which attend to the meanings which result from principled engagement with the world, by all, whether they may or may not have power. What is at issue here is the shift which underlies the ‘listening pedagogy’. The questions at the bottom of that pedagogy are: ‘How can I attend to the meanings of the other? And what is the benefit for me if I attend to the meanings of the other? Could there be a curriculum and a pedagogy which attended to the meanings of the other?’

Of course in the end, I may very well still need to say ‘These are your meanings, made on the basis of your principles. I now understand how you
saw it. I understand the semiotic work that you have done. And yet, here, in my curriculum, is the work done by your culture over time, the work of many others, and we can put these two side by side acknowledging your work and its value and yet also showing you what others have done, and its value’. This would lead to a pedagogy which acknowledges and values the (semiotic) work of students and yet does not give up the importance of authoritative knowledge.

10 Conclusion

All of the above raises questions around identity and the making of identity. In the previous era, identity was achieved through integration into the structures and the institutions of the state and of the economy. Now identity formation happens through participation in consumption – at least for those who can – but participation in consumption without agreed or overt ethical guidelines, other than those which the market might offer. As a consequence, the issue of ethics has, in my view, become a central matter which school curricula need to have at their base: to engage, precisely, with issues of choice: how can we make decisions about representation, how can we make decisions about equitable participation, how do we know whose interests count? Such questions had been implicit in pedagogies and curricula in the past: curriculum, for instance, determined by power, but also as an essential shared social resource of common meanings, values, practices. In the era of the personalized curriculum the principles of the market are about to become dominant in the domain of education. Where then are the meanings of the other?

Ethics everywhere touches on the question of choice, and choice is the basis of meaning: What choices are there? What effects are there from different kinds of choices? What are the meanings and consequence of choice in each particular instance? Who is affected in what ways? Who is excluded and who is included by the choices we make? Where there are contested interests, as there inevitably are, whose interests do or should prevail? In a period of increasingly rapid and deepening social fragmentation the meanings of the other must be recognized, even where they are irreconcilable with ours. And the principles of choice at the base of the meanings of the other need to be made visible and be available as the subject for debate. How can contested meanings be integrated and reconciled?

These are not new questions but they need now to be brought firmly into the centre of a curriculum of representation and its pedagogy. Representation and communication are always social matters, and as such they respond to social changes. The changes which characterize the present require a quite fundamental reassessment of our understanding of representation and communication, of the role of individuals and their agency as of the means of representation and the affordances of the (new and old) media. A linguistic account alone is not adequate as a theoretical
basis, given the profound differences in affordances of modes; hence the necessity for a social semiotic theory. An account of language alone cannot provide an understanding of the range of potentials of the contemporary world of communication and their effects on subjectivity.

References


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1 Introduction

Children’s picture book stories are significant educational texts in at least two respects. On the one hand, Meek (1988) long ago pointed out that good children’s literature provides implicit lessons in literacy for young readers. She exemplifies by showing how even an apparently extremely simple picture book may make such pertinent choices in what it depicts and how it does so, and in what it says and how words relate to images, that it will have an important agentive role in teaching the child about reading. On the other hand, picture book stories are powerful ideological tools in their social function of ‘naturalizing’ (or, less frequently, challenging) prevailing values about childhood, home and family. For example, in contemporary children’s books in English, sibling warfare is constructed as ‘normal’, while the repetitive visual presentation of certain forms of play or certain idealized settings endorses these as uniquely appropriate for the experience of childhood. Whether our concern, then, is with initial literacy or more ‘critical’ literacy, we need to understand the way meanings can be created visually as well as verbally.

Despite the significance of this form of text, educators have far less in the way of theory and analysis to draw on in understanding and teaching about the visual strand of meaning in picture books than is available for understanding verbal narrative. In respect of the latter, there is a long and valuable theoretical tradition of narrative analysis, focusing on the role of language in transforming ‘story’ into ‘discourse’ (Chatman 1978), by means of characterization, temporal sequencing, the construction of point of view via narrative voice and focalization, and so on (e.g. Chatman 1978; Genette 1980; Rimmon-Kenan 1983; Toolan 2001). When it comes to the analysis of the visual strand of meaning in picture book narratives,
however, there is no comparable tradition of analysis despite the seminal contribution made some decades ago by Nodelman (1988) and insightful interpretive readings of specific texts provided by Lewis (2001), Spitz (1999), Stephens (1992) and others. What is still needed is a more systematic account of the semiotic choices underlying visual narratives, such as has been developed for verbal stories. This chapter aims to contribute to such an account and thus provide tools for understanding how picture books mean and for reflecting on the teaching and learning of picture books.¹

One foundation for such an account has been provided by Kress and van Leeuwen (1996) in their discussion of the ‘grammar’ of the image, where the semiotic options that may be taken up in any image are laid out in detail (see Zammit, this volume Chapter 3, for application to texts written for older children). Their analysis makes use of the ‘metafunctional’ principle first proposed by M. A. K. Halliday in relation to language (Halliday 1978, 2004). According to this principle, every text (whether in verbal, visual or other mode) functions to achieve three different kinds of meaning simultaneously. On the one hand the text enacts roles and attitudes, creating a relationship between addressor and addressee, thus embodying the ‘interpersonal’ metafunction. At the same time, these roles, relations and attitudes are established with regard to some content or idea being talked about (or depicted or enacted) – this is the ideational metafunction. A third metafunction, the ‘textual’, organizes and coordinates the meanings created by the other two to build text that links coherently to co-text and context. The strength of Kress and van Leeuwen’s description of the ‘grammar’ of visual images lies in the way that it considers the image systematically from each of these perspectives and generalizes across a variety of image types. This chapter similarly incorporates a metafunctional perspective but focuses specifically on images within picture book narratives and on some of the meaning possibilities for sequences of images within this genre. By considering specific aspects of two of the metafunctions, the interpersonal and the ideational, it will show how some traditional concerns of narrative theory are realized through the visual as much as the verbal strand of a picture book. The discussion will be based on findings from analysis of over 50 highly regarded picture books, ranging from those with minimal text and aimed at very young readers through to others with a greater proportion of verbiage and more sophisticated themes.

2 Interpersonal meaning: The visual creation of narrative ‘point of view’

With respect to the interpersonal metafunction and thus to the issue of ‘point of view’, Kress and van Leeuwen (1996) discuss three kinds of meaning particularly concerned with building relationships between the viewer/reader and the visual text: those of ‘social distance’, of ‘attitude’ and of ‘contact’. While it is the final system of ‘contact’ that will be
expanded upon here, all three need to be recognized as playing a role in positioning the reader of picture book narratives. The system of ‘social distance’ refers to the degree of intimacy set up between the viewer/reader and those depicted in an image, with close-ups of faces creating intimacy between reader and character, while full length views of the character within a larger context have the opposite effect. These choices vary between individual books or within a single story. Options in this domain also interact with what Kress and van Leeuwen refer to as ‘attitude’, which concerns the way the reader is positioned by the choice of vertical or horizontal angle. Choice of vertical angle realizes relations of power, with the depicted characters exhibiting power when we ‘look up’ to them from a low angle, and vulnerability when we look down on them from a high angle. Less obviously, as Kress and van Leeuwen argue, the choice of a ‘front on’ horizontal angle invites our involvement with what is depicted, while an oblique or side-on horizontal angle detaches us emotionally.

2.1 Contact

According to Kress and van Leeuwen (1996), one of the most important visual systems within the interpersonal metafunction is that of ‘contact’ and this is indeed a crucial one for establishing point of view in a narrative text. In their analysis, they distinguish between an image depicting a person, animal or anthropomorphized object that gazes out to make eye-contact with the viewer and one where this is not the case. These two options will be referred to here as ‘contact’ (+ eye contact) and ‘observe’ (− eye contact) respectively, to indicate whether the viewer is being positioned to engage with the person depicted or simply to observe him/her. The question of how frequently, by whom and at what points the ‘contact’ option is taken up (if at all) will clearly be relevant to understanding how the reader is being placed in relation to the characters.

It is not uncommon, for example, for the contact option to be used in the very opening of the text, as a way of introducing the characters to the reader (as in Browne’s books *Piggybook* (1986) and *Zoo* (1994)). The contact option at this point combines with particular choices of ‘social distance’ and ‘attitude’, as well as the character’s depicted emotion, to orient us to the character in a particular way right from the start. At the same time the accompanying verbal text may use speech role pronouns (*I* and *you*) to mirror the visual address, or may have a third person narration so that the bi-modality of the text is exploited to address the reader simultaneously in different ways. In Browne’s *Piggybook* for example, we make contact via gaze with the male (chauvinist) member of the Piggot family on the first page, but no intimacy is established by the long shot and they are presented as both powerful and pleased with themselves, features the third person verbal text subtly reinforces.

Besides being used to introduce characters, a contact image may occur at a key moment in the story, pausing the action. Its role then may be to signal a shift in the narrative structure, to encourage empathy with the protag-
onist’s dilemma and/or invite the young reader to interpret aspects of the character symbolically as well as literally. An example of the latter occurs in Browne’s *Zoo*, a story about the morality of caging animals and about relations between humans and animals. Here a decontextualized picture of the narrator and his brother gazing out at us wearing caps decorated with smiling monkey faces occurs during the story and visually confers the attributes of monkeys on to the children. (See Kress and van Leeuwen 1996: 108ff for discussion of ‘symbolic attributes’ in visuals.)

2.2 Character focalization

In most cases, we may consider the contact between the viewer and character to be ‘direct’ in that there are no grounds for supposing anything other than that it is the character and the viewer/reader directly

Figure 2.1 [contact: vicarious]. From A. Baillie and J. Tanner *Drac and the Gremlin* (Penguin Australia)
addressing each other. However, while the reader may contact (or alternatively observe) a story book character directly, it is also important to recognize that in a narrative text the reader may be positioned to view the story world through the eyes of one of the characters, whether that be the protagonist or someone else. In narrative theory, the question of whose eyes we are seeing through has long been recognized as a crucial aspect of the construction of point of view and is referred to as ‘focalization’. In the following text excerpt, for example, the character Mr Jones becomes the focalizer at the point where the text says Mr Jones watched:

Mr. and Mrs. Jones took the children to the gate and said goodbye. Mr. Jones watched the girls skipping down the lane until they disappeared round the corner.

At that point we experience the actions of the story world through Mr Jones’ eyes, unaware of what might be happening to Mrs Jones or what the children are thinking or seeing.

Visually too, the reader can be set up to view the story world vicariously through the eyes of a character, either consistently or at certain points in the story. This is achieved in several ways. In the most straightforward case, a single image can achieve this by depicting some part of the character whose eyes we are viewing through, as in Figure 2.1 above from Baillie and Tanner’s *Drac and the Gremlin* (1991). Here the mother’s hands holding the ice creams are visible, just as she might see them herself. Similarly, in Figure 2.2 from Gleeson and Greder’s *The Great Bear* (1999), the bear’s shadow is visible in the image, emanating from the point where the reader is ‘placed’.

![Figure 2.2](image-url) [observe: vicarious]. From L. Gleeson and A. Greeder *The Great Bear* (Scholastic Australia)
As these examples show, the reader may be positioned to view the protagonist(s) vicariously through the eyes of someone else in the story world (as in Figure 2.1, where the children are the main characters), or may ‘become’ the protagonist (as in Figure 2.2, where the bear is the main character). Simultaneously, the reader-as-character may be visually addressed by another character in a contact image (as is the owner of the hands in Figure 2.1) or may be in the observer role (as when looking through the bear’s eyes in Figure 2.2). The choice of viewing through the eyes of any character is termed a ‘vicarious’ as opposed to a ‘direct’ view.

Secondly, character focalization can also take place visually through the juxtapositioning of images on adjacent pages (known as ‘across frame’). Sometimes the first image in such a sequence depicts a character who establishes contact with the reader and the second depicts what the character is looking at, as in Figure 2.3 showing the layout of two pages from Browne’s *Zoo*. We then observe through the character’s eyes. Clearly, more inferencing is required from the reader here, especially as, although one image succeeds another in the layout, the reader needs to interpret them as simultaneous in time. Because of this, the child may need the language of the text and/or guidance of an adult co-reader to mediate and support the interpretation.

Even less explicitly, we may view the story world via a focalizing character by means of a sequence of two ‘observe’ images where the angle of viewing guides us to see the story world through the character’s eyes. This is done for example in Hathorn and Rogers’ *Way Home* (1994), when we first observe the boy protagonist climbing a tree and then on the next page, we vicariously observe a view of the city looking down from above, requiring the inference that this is the view the boy is getting from that tree.

**Figure 2.3** [observe: vicarious: across frame]. Layout of spread from A. Browne *Zoo* (Red Fox)
It is equally possible to make contact through the characters’ eyes across the image frame (i.e. through a sequence of two images). This occurs when an observe image is followed by a contact one, but the use of vertical angle for example suggests that the contact is being made ‘through the eyes’ of a character rather than directly by us as readers. This is exemplified in Figure 2.4 from Gleeson and Greder’s *Uncle David* (1992), where the low angle in the second picture guides us to recognize that we are making contact vicariously through the child character’s eyes.

![Figure 2.4](image-url)

*Figure 2.4 [contact: vicarious: across frame]. From L. Gleeson and A. Greder *Uncle David* (Ashton Scholastic)*
Finally and very importantly, the nature of the visual medium also allows for the possibility of simultaneously having a reader perspective and a character focalized perspective. This can be achieved within a single observe image where we are visually positioned behind the character. The first full page image from Browne’s *Gorilla* (1983) is such a case. In it we see the child protagonist, Hannah, sitting with her back to us facing her father across the breakfast table. In this view, we are positioned behind Hannah, looking at her as well as at what she sees. This option of observing

![Image](image-url)

**Figure 2.5** [observe: vicarious: along with character]. From A. Baillie and J. Tanner *Drac and the Gremlin* (Scholastic Australia)

Finally and very importantly, the nature of the visual medium also allows for the possibility of **simultaneously** having a reader perspective and a character focalized perspective. This can be achieved within a single observe image where we are visually positioned behind the character. The first full page image from Browne’s *Gorilla* (1983) is such a case. In it we see the child protagonist, Hannah, sitting with her back to us facing her father across the breakfast table. In this view, we are positioned behind Hannah, looking at her as well as at what she sees. This option of observing

![Diagram](diagram-url)

**Figure 2.6** Visual focalization
‘along with’ the protagonist is beautifully realized in Browne’s coloured image by having the child character’s back view – viewed by the reader but not the character – in bright, warm, saturated colours, while everything that the character herself can view is in washed out, cool, blue tones. The reader is thus subtly alerted to the fact that Hannah’s mood is ‘colouring’ her view of the world and also to the fact that the reader does not have to take on Hannah’s perspective uncritically but can maintain a distinct point of view. This choice of viewing ‘along with’ the focalizing character is always realized by having the viewer placed behind the character, facing what they are viewing though not necessarily sharing the same horizontal angle.

A different effect is achieved by this choice in Baillie and Tanner’s *Drac and the Gremlin* (1991), where the interplay between the visual and verbal choices is important. The mother does not appear at all in the verbal text, which tells the story of the children’s imaginative play. However, the visual inclusion of her in two pictures at the end of the story, where both observe and contact views are mediated through her (see Figures 2.1 and 2.5), suggests that the high angle from which the child protagonists have generally been viewed throughout is interpretable in terms of the mother’s gaze. In this way, a second reading of the text is different from the first, and the book can simultaneously address an adult and child reader, smoothly managing the double address so characteristic of the successful picture book.

In sum, the basic distinction between contact and observe can be elaborated into a ‘system network’ as shown in Figure 2.6, where choices separated by square brackets are alternatives and sets of alternatives within a curly brace are available concurrently. A reading of any text which pays attention to the choice of options at each point, and how they relate to the way focalization is managed in the verbal text, will come closer to understanding the interpersonal effects of the visual strand of the story and how the juxtaposition of visual and verbal meaning can indeed multiply the meaning potential of the text. Importantly, it will also help educators appreciate how much interpretive work is being required of the inexperienced reader at different points in any text, and at which points such readers may need more explicit guidance.

3 Ideational meaning: the creation of activity sequences

In terms of the ‘ideational’ metafunction, we can add to Kress and van Leeuwen’s detailed account of the possible experiential choices carried within an image, by considering also the ‘logico-semantic’ relations that link different depicted actions. In the linguistic system, this involves the linking of linguistic units in semantic relations of ‘expansion’ (links of time, cause, comparison, etc.) and ‘projection’ (clauses of saying and thinking together with quoted and reported speech and thought, as in he said ‘Mary’s late’, he thought Mary was late, etc.). This section will explore
which of these semantic relations can be found to obtain visually between adjacent images in picture book stories.

3.1 Expansion relations

3.1.1 Comparison

As the visual semiotic is not inherently time-based in the same way as language is, the essential relation between any two juxtaposed images is not one of addition or sequence but of comparison and contrast. Two successive images invite comparison and any further semantic relation must be inferred by attending to sameness and difference. For this reason, comparison/contrast relations are available whenever two images are juxtaposed. Similarity may be foregrounded when images are presented with uniform size and orientation within a symmetrical layout, creating a co-classification relation (as discussed by Kress and van Leeuwen 1996); otherwise both similarity and difference are simultaneously available and equally relevant. Comparison/contrast relations are thus always present between images at the same time as any of the other relations to be discussed below.

3.1.2 The unfolding of events in time

The essence of narrative is, of course, the unfolding of events in time, leading narrative theorists to attend carefully to such matters as the order in which events are related (e.g. a simple chronology or one involving flashbacks, repetitions, etc.) and the variation in the amount of text time expended on different events. Such concerns are obviously equally relevant to the distribution of events through the pictures in a picture book. Where a depicted character is ‘repeated’ over two images, but with variation in the setting or in the action shown, a temporal relation between the two images is readily understood, something we simply take for granted as experienced readers of visual stories. Very young children, however, have to learn to appreciate that a second depiction of something in a narrative (but perhaps not in an information book) typically implies a temporal relation. That this is not necessarily obvious to very young children became apparent when a teacher and a 3-year-old were reading a new book: Cooper’s (1997) *The Baby who wouldn’t Go to Bed*. This book depicts a toddler driving his toy car, first in the house and in the next picture, driving out the doorway into the landscape. On seeing the second picture, the child exclaimed ‘Oh wow look, he’s got two engines’, clearly misreading the implied temporal relation (‘then’) as one of addition (‘and another’), prompting the adult to gently correct him with ‘He does have two engines doesn’t he? I think this one is the same one and he’s driving up the hill.’ Whereas language provides a means of identifying and keeping track of participants through ‘reference’ (*the baby... he*) and a
means of making logico-semantic relations explicit through conjunction \((\text{and then, and so})\), the visual semiotic relies on our appreciation of the nature of narrative to make the comparison between juxtaposed images to draw the appropriate inferences.

### 3.1.2.1 Succession between and within activity sequences

It is rare in children’s picture books to come across anything very complex in terms of sequencing (such as flashbacks or flashforwards). The main variation is in the ‘size’ of the events depicted in different stories (ranging from the small details of a single day to the larger trajectory of, say, a fairy tale) and the significant variation within any text concerning which actions are accorded more or less text time. In order to reflect on these matters, and on how the verbal text interacts with the visual choices, it is useful to operate with the notion of an ‘activity sequence’, as described by Martin (1992: 537–8) following Barthes:

Barthes’s notion of sequence was developed in the context of studying the relations between story… and discourse… in narrative theory (see Toolan 1989-11)… Barthes’s sequence, which is equivalent to the notion of activity sequence used here, is defined as follows:

A sequence is a logical succession of nuclei bound together by a relation of solidarity (in the Hjelmslevian sense of double implication: two terms presuppose one another): the sequence opens when one of its terms has no solidary antecedent and closes when another of its terms has no consequent. To take another deliberately trivial example, the different functions order a drink, obtain it, drink it, pay for it constitute an obviously closed sequence, it being impossible to put anything before the order or after the payment without moving out of the homogenous group ‘Having a drink’ (Barthes 1977: 101)

Following Barthes, then, an activity sequence like ‘having a drink’ might be depicted visually as a series of images showing the individual actions or nuclei. At the same time, a single nucleus of that sequence, such as ‘pay for drink’ could in turn be decomposed into a sequence like ‘open bag’, ‘take out wallet’, ‘hand over money’, etc. Alternatively a sequence like ‘having a drink’ could itself be a single nucleus within a larger sequence, such as ‘going to the pub’. The two points to draw from this are, first, that reading a narrative successfully relies on our cultural understandings of how actions combine into sequences, and, secondly, that our representations of actions, whether visual or verbal, may specify them at greater or lesser levels of detail – a single action may be decomposed into a sequence of clauses or pictures, or a sequence may be encapsulated by a single clause or image. Any picture book text will tend to set up its own ‘baseline’ or norm for depicting (or narrating) an activity sequence, such that any variations gain significance.

Generally speaking, the less verbal language there is in the book, the smaller the scale of the actions depicted. Thus wordless picture books with multiple images per page are more likely to depict in successive images very small units of action, as in Ormerod’s \textit{Sunshine} (1981), where the
activity of ‘waking up’ takes place over four or five successive images on a single page. In such a case, as long as the child reader understands that the successive representations signify a single character acting over time, no inferencing is required; every stage of the activity sequence has been made visually explicit. At the other extreme, a text with a considerable verbal component and conveying a much longer period of time may display quite separate activities in successive images. This is the case in Gleeson and Greder’s (1995) *The Princess and the Perfect Dish*, where one image shows the princess in conversation with her parents, and the next shows a different set of characters in a different location doing something else. These images clearly depict different activity sequences and without the mediation of the verbal text no further sense can be made of them. The most fundamental option, then, where images are in a relation of unfolding in a temporal succession is whether following images depict different actions within a sequence or in quite different sequences. Where the latter is the case, the child reader is less able to interpret the story purely from the pictures.

There are at least three general reasons to concern ourselves with the way images are used in picture books to depict the events of the story and the extent to which sequences are decomposed into individual actions. One relates to the inexperience of child readers, for whom it will always be

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Figure 2.7 [succession]. From R. Briggs *The Bear* (Red Fox)
relevant to consider how much inferencing is being required; in other words, how much is being taken for granted as understood and thus elided from the visual depiction. A second and related issue concerns inter-modality. That is, to understand the interplay between visual and verbal components of the picture book text, we need to see how meanings are distributed between the visual and the verbal – to ask which modality at any point is doing the main work of conveying the succession of events and why. There is also the issue of variation in how the succession of actions is articulated purely in the visual text. While some texts may maintain a consistency in what typically gets covered in a page or spread, it is also possible for a text to set up a typical pace, but then convey significance by varying the pattern – either by slowing down or speeding up.

3.1.2.2 SHIFTING PACE

Briggs’s (1996) text *The Bear* is an interesting one to examine in light of these issues of reader inference, inter-modality and narrative pacing. The story involves the unexpected night-time appearance of a polar bear in the bedroom of Tilly, the main character. In the course of the story, Tilly takes part in the pleasures and annoyances that go with taking responsibility for another as she looks after the bear, whose presence her parents indulgently accept as part of the wonder of childhood imagination. There is no verbal narration in the text, only dialogue, the amount of which varies from none at all, to an occasional speech bubble, to more extended stretches of dialogue accompanied by images. Visual depiction of events similarly varies, setting up an initial ‘baseline’ pace where the gradual progress of the bear’s arrival through Tilly’s bedroom window is depicted ‘slowly’ in a series of images in the first few pages, following which there are a number of interesting changes of pace carefully aligned with variation in the verbal content.

For example, at the same time as there is a visual sequence which depicts Tilly entering the family breakfast room (see Figure 2.7), the dialogue between Tilly and her parents (as she tells of the bear’s arrival) provides a verbal repetition of the sequences previously shown over several pages purely through the visual. Textual repetition in a narrative enhances the significance of the events repeated but is also facilitative for a young reader, in clarifying and fixing the sequence of events. In purely verbal texts, some children’s writers are careful to have important events narrated and then retold through dialogue, but there has been no real investigation of the distribution of visual narration and verbal dialogue in a text such as this. The ‘speeding up’ of the pace of the narrative at this point of Briggs’s text serves a number of functions. First it allows the verbal text to do the repeating and summarizing work already referred to; secondly the relative ‘speed’ of the breakfast sequence serves to background the activities of the girl in relation to her parents, since these are not what the story is primarily concerned with. Finally, the increased pace gives the reader an oppor-
tunity to imagine the activity sequences that are presented only verbally but not depicted. This occurs after the summarizing dialogue that takes up most of the left page of the spread in Figure 2.7 In the lower image on that left-hand page we see Tilly leaving the room in her pyjamas with a slice of bread, saying ‘I’ll take him up a bit of bread and butter’; then in the next picture at the top of the right-hand page we see her re-entering the breakfast room fully dressed, saying: ‘There he’s asleep now’. This leaves the reader to ‘fill in’ the sequences of Tilly feeding the bear, putting him to bed and getting herself dressed, thus stepping up the demands on reader inference.

Once the parents have made their exit, the visual text slows down again to the ‘baseline’ pace of the opening, but also at one point includes an even further slowing down. This occurs as Tilly tries to bath the bear. The nucleus action of ‘putting face into water’ is shown over two images rather than one. These lovely images invite the reader to slow down and conjure up the sensuous experience for the bear of gradually entering the water. Children’s literature critics such as Wall (1991) have long argued that action-driven narratives for children fail to apprentice them into literary ways of reading. She argues that ‘emotional detachment is a prerequisite to this kind of fiction’ (208–9) and places a premium on writers who teach sensitivity by insisting on attention to minute details of feelings and behaviour, thereby training the young reader to slow down and attend. A picture book like The Bear can also provide a valuable apprenticeship in such a ‘literary’ orientation by taking advantage of the affordances of the visual medium, which is inherently less dynamic than the verbal, to encourage the child to savour the moment and imaginatively experience the protagonist’s sensations.

Options discussed so far for the narrative unfolding of actions created by a sequence of images are displayed in Figure 2.8 above. The figure suggests that a ‘succession’ of images can represent steps within a single activity sequence, or alternatively may represent distinct sequences. If the first, the sequence as a whole can maintain the pace established in prior images, or may speed up or slow down the pace. When the pace speeds up, a sequence of actions may be encapsulated in a single image as a single action; when the pace slows down, a ‘single’ action is represented as a series of images, visually expanding the action into a sequence.
3.1.2.3 Simultaneity

Even more readily than the relation of temporal succession, juxtaposed visuals afford the relation of simultaneity. As long as the images are available on the same or facing pages, they can instantaneously present more than one action at once. This capacity is used to great effect by Burningham in *Come Away from the Water, Shirley* (1992), about a family’s day at the beach. Here, facing pages depict the mundane activities of the parents on the left and the imaginative world of the child, Shirley, in the right hand image. Thus, as well as a temporal sequence between each double page spread as pages are turned, there is, after each page turn, a temporal relation of simultaneity between the facing pages (see Figure 2.9).

Figure 2.9 [simultaneity]. From J. Burningham *Come Away from the Water, Shirley* (Red Fox)

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Figure 2.10 [— fulfilled/ + cause]. From B. McKee *Not Now Bernard* (Andersen Press)
Importantly, of course, in addition to these two sets of temporal relations, the nature of the layout and the different pictorial style of the two facing images (where the adult world is crayoned in muted colours with a bare context and the child’s imaginative world is painted in a rich palette of colours) invites comparison and contrast between them. This means there is in fact a triple set of relations operating simultaneously, making a rich set of meanings for a young child even without taking the verbal component into account.

3.1.3 Counterexpectation and causality

While the essence of any story involves a temporal sequence, a narrative text requires also the notion of counter-expectancy. Indeed, Barthes (1977) observed that the notion of (activity) sequences involves both expectancy and risk. That is, we have an expectation about the next action to come in a sequence and thus there is always the risk that it will not be fulfilled. This means that counter-expectation is crucial in the creation of a narrative problematic, and may be made highly salient in texts that effectively apprentice young learners into literacy. A classic example is Hutchins’ (1970) *Rosie’s Walk* where we find repeated depiction of ‘unfulfilled’ sequences over two double spreads (e.g. the fox in mid-air leaping above the hen, followed, after turning the page, by the fox coming to grief and failing to get the prey).

Another story exploiting expectancies is McKee’s (2005) *Not Now, Bernard*, where the facing images on the first spread set up a pattern in which the parent’s activity sequence is unfulfilled, creating a ‘but’ relation between the two pages (see Figure 2.10). At the same time, the visuals present another fundamental feature of narrative by depicting an interplay between the activity sequences of different characters. In doing so, the visual sequence allows for a relation of causality to be inferred between the actions of the two (that is, the reader can infer that the distraction of Bernard’s speech causes Dad to hammer his finger instead of the nail). Interestingly, the text, with its humorously subversive theme about parent/child relations (Bernard’s repeated attempts to tell his parents about the monster in the garden are repeatedly ignored), works equally well for the child reader who does not make this inference as for the adult who may do so enthusiastically.

3.2 Projection

In a verbal story, the relation of projection occurs where verbal speech and mental thoughts and perceptions are attributed to characters (e.g. *Mary said/ thought/ saw/ remembered... that Mum was coming*), a feature that might appear to depend on verbal language. However, while this is obviously true for representing speech, picture books do sometimes exploit image sequences to show the mental life of characters. Most commonly, images
can depict the visual perceptions of characters as we have already seen in Figure 2.3. In section 2, this image sequence was discussed in interpersonal terms, focusing on the fact that on the second page the reader looks through the character’s eyes. The sequence can also be interpreted ideationally, focusing on the fact that the left image depicts the thinking or sensing person (‘she sees’) and the second image (of the baboons) depicts some other part of reality that is seen and thus enters their consciousness (‘the baboons are squabbling’). This would be a relation of projection: real⁴ (see Figure 2.11).

Less commonly, children’s picture books may construct a relation between adjacent images where it is not a ‘seer’ and a ‘sight’ that is represented, but a ‘thinker’ and a ‘thought’. This can be referred to as projection: imagined. Burningham’s book *Granpa* (1984) provides examples of this. This text is mainly a series of similar double pages, each of which has a full page coloured image on the right and a small black and white drawing on the left page (below some verbal text). In these spreads, the right-hand page depicts Granpa and granddaughter together and as we go through the text, we begin to interpret Granpa as a ‘thinker’ in relation to the small black and white illustration on the left, which often appears to represent his ‘thought’. In one spread, for example, we see Granpa and grandchild singing in the coloured image on the right while the black and white sketch on the left depicts three small boys singing to the accompaniment of a piano. In another example we see Granpa and grandchild playing with her dolls and soft toys on the right and a drawing of a teddy in high heels in front of a mirror on the left. The relation between these pairs of images is probably dependent on the mediation of the verbal

![Figure 2.11 Expansion and projection relations between images in pictures books](image-url)
component for its interpretation, even though all that is provided there are fragments of dialogue. The most plausible interpretation is that the inter-image relation is one of projection, where the thinking character is depicted in colour on the right and what they are thinking about is on the left (this relation is termed projection: imagined in Figure 2.11). Despite the apparent simplicity of the illustrations and the accompanying verbal language, this is clearly a complex text, requiring an active reader to do the work of inferring the meaning relation between the paired images. Adding to the complexity is the fact that the projected thought is not always of the same kind. In the first example described above, where the participants sing, it is the projection of memory as Granpa recalls his youth, while in another case it might be the current imagining of either child or adult. As the verbal text itself does not construe projection, and the visual images might be insufficient on their own to enable its construal, the text exemplifies well the fact that the synergy between image and text (and between image and image) creates a greater meaning than simply the sum of the parts.

3.3 Summary of logico-semantic relations

In looking at the logico-semantic meanings carried by sequences of images within these narratives, we find both expansion and projection relations represented and also that, perhaps even more economically than language, a number of relations can be carried simultaneously. The options discussed are displayed in their entirety in Figure 2.11.

4 Conclusion

This chapter has argued that to better understand how picture books work, so that we can be alert both to the challenges they may present to children and the subtleties of the ways their creators use the visual medium and play it off against the verbal, we need to extend our visual grammar to explore visual meaning choices at the discourse level. In doing this, it is valuable to adopt a metafunctional perspective, and to focus on relations across images as well as meaning choices made within individual images. To exemplify, this chapter has considered one aspect of interpersonal meaning (the contribution of visual focalization to the construction of ‘point of view’) and one aspect of ideational meaning (that of semantic relations between images depicting narrative sequences). The meaning systems elaborated here are of course only part of the picture. Adopting the metafunctional principle reminds us that there are other interpersonal semantic systems to be explored, such as those relating to ‘inscribed’ and ‘evoked’ affect (Martin and Rose 2003); other ideational choices, such as those for the visual depiction of character and of settings, and that the textual (or Kress and van Leeuwen’s ‘compositional’) metafunction in these picture book narratives also warrants close attention. The analytical
framework provided here, then, is only a very partial one, but it is hoped that it provides useful tools for beginning to deconstruct these bi-modal narratives. By seeing more clearly how these texts mean what they do, we can facilitate reflection on the relative dependence of the narrative on its verbal component, on the demands any particular text makes of its readers, on the subtleties of the ways it might position readers to respond and on the ways interrelations between visual and verbal meaning indeed allow for meaning beyond that offered by either mode in isolation. These are all matters of great relevance to educators who use this material with young children, for whom it may be their entry into both literacy and literature and for whom the ‘transparency’ of visual meaning cannot be assumed. Teachers must make choices not only about what meanings will need to be made more explicit to children to facilitate understanding of these surprisingly sophisticated texts, but about the extent to which it will be valuable to alert young readers to the visual semiotic resources at an artist’s disposal and how these are being used to align readers with the narrative’s overall thematic significance.

Notes

1 The research on which this chapter is based was supported by a University of Sydney SESQUI grant and an Australian Research Council Discovery grant and undertaken by the author in collaboration with Talia Gill, J. R. Martin and Len Unsworth.
2 Kress and van Leeuwen (1996) use the terms ‘demand’ and ‘offer’ to describe these options.
3 Data courtesy of Dr Jane Torr, Institute of Early Childhood Education, Macquarie University.
4 Mental processes of perception in verbal language construe an ‘act’ like the baboons are squabbling as a participant within the clause, rather than a ‘projection’; however, the visual medium does not afford the linguistic distinctions between ‘act’, ‘fact’ and ‘idea’ (Halliday 2004), instead providing a visual layout that is comparable between ‘participant seeing’ + ‘sight’, and ‘participant thinking’ + ‘thought’. Given this, it can be argued that visually the relation is one of ‘projection’ in both cases.

References

1 Introduction

Daily, students engage with a range of texts from different modes: they watch TV, play video games and use game consoles; they read magazines and children’s literature; they talk to peers and adults; they search for information from print and electronic sources; they discuss their views on programmes, music, pop stars, movies and actors, as well as read about them; they chat online and send SMS messages to each other. But in the classroom the texts students engage with do not necessarily represent this multiplicity of types, modes or media.

Ideally, the classroom should prepare learners for multimodal literacy. Thus, literacy educators need to provide for the impact of new texts, new literacies and new information and communication technologies (ICTs). For many this involves the recognition of the need for critical media literacy or critical literacy to inform praxis in schools in order to enable students to be analytical, to question the texts that they are exposed to and use this knowledge in the creation of texts in similar contexts (Knobel and Healy 1998; Luke 1999; Semali 2003). Critical literacy involves ‘all texts – popular culture and canonical, media and print, audio, visual and the like’ (Alvermann and Hagood 2000: 201). Students who are critically literate are:

- critical and selective viewers and consumers of popular culture;
- able to reflect critically on media messages, their own selections and pleasures from media and texts; and
- able to use those critical skills in the production of their own multi-media or audio-visual texts (Luke 1999: 623).

Within educational institutions, like schools, teachers apprentice students into the discourses of power, those within society as well as those relevant
to an educational setting. Popular culture is a powerful medium that can engage students in developing literacy skills beyond that of reading standard written paper-based texts (Giroux et al. 1989; Buckingham and Sefton-Green 1994; Marsh 2002). The texts in popular culture are multimodal and have a powerful voice, sending messages to young children. Hence, it is important to develop students’ critical literacy skills in regard to the construction and meanings conveyed in both the visual and written texts contained within popular culture, such as the texts in children’s magazines. By interrogating the multimodal texts found in children’s magazines we can develop a more critical reading position in students so they are not as accepting of the messages in these texts.

In order to develop a critical perspective, students need to be explicitly supported by teachers to develop understandings and skills about texts as well as a means to articulate and share their knowledge and understandings. They require a language to describe school and popular texts in a purposeful and constructive way, so they can discuss the techniques employed to convey meaning to a reader (Unsworth 2002; Zammit 2002). In order for children to talk about the written, visual or multimodal texts, students need to be apprenticed into a language to talk about the affordances in the different modes: a metalanguage (New London Group 1996; Zammit and Downes 2002; Kress 2003). One basis for this metalanguage is Systemic Functional Linguistics (SFL), which views language as a social construction, with the creator of a text making selections from language or other modes of meaning to convey their message.

SFL provides a language to talk about written texts, a metalanguage, which can be understood and used in schools and which links the levels of context, text and grammar (Martin 1999; Williams 1999). SFL describes a text in terms of how it realizes what is happening (ideational function), how it interacts with a reader (interpersonal function) and how a text coheres (textual function) and these meanings are represented in the choices of language (Halliday 1985). It also provides tools, i.e. a language, that can be used to engage students in critical literacy strategies in the classroom and as a means to critique the texts and messages being conveyed (Christie 1996; Martin 2000). The implementation of this approach in the classroom enables detailed study of the construction of meaning in texts and enables students to discover the hidden, often stereotyped, messages and talk about them openly.

Although other modes of representation have not been as significantly described as the written or spoken mode, Kress and van Leeuwen (1996) have developed a grammar for the visual mode drawing on the principles of SFL. Their work provides a framework, with accompanying metalanguage, for describing visual texts, as well as visual–verbal ones, which has been used by a number of researchers of multimodal texts (see for example, Callow and Zammit 2002; Jewitt 2002; Unsworth and Wheeler 2002).

In this chapter I provide the background to a multiliteracies project and then briefly consider pedagogical models for multiliteracies. I then
describe the texts in children’s magazines in a generalized way before focusing on the construction of feature articles: their generic organization, key language and visual features. From this background, I provide details of some activities used to scaffold students explicit learning of the verbal and visual components of feature articles, and associated metalanguage, concluding the chapter with the use of these understandings in the manipulation and creation of students’ own multimodal texts.

2 The context

The project that forms the basis of this chapter was part of a larger co-researching project involving academics from the University of Western Sydney and the Priority Schools Funding Program (PSFP, formerly known as the Disadvantaged Schools Program, DSP) in the Liverpool and Fairfield Districts of Sydney. PSFP schools are identified based on the low socio-economic status of families whose children attend the school. The priority area for the PSFP was entitled ‘Fair Go Fair Share Fair Say Fair Content’ from which the title ‘The Fair Go Project’ (FGP) was coined. The main aim of the project was (and still is) ‘to explore, evaluate and describe in detail the kinds of classroom pedagogies that bring enhanced outcomes for educationally disadvantaged students’ (Munns et al. 2003). The curriculum-based projects involved a researcher and class teacher working closely together in the implementation of an integrated teaching programme. The multiliteracies project was developed around a commitment to critical media literacy. The New Literacies Environment curriculum framework (see Figure 3.1) (Downes and Zammit 2001; Zammit and Downes 2002) informed the development of the programme in the Year 4 class, with 9 and 10-year-old children, and the integration of multiliteracies into the classroom.

The school is located in the southwest area of Sydney, Australia. There is a mix of cultural backgrounds, with a predominance of children coming from an Asian background, mainly Vietnamese (42%), Chinese (22%) and Khmer (10%), with Anglo-Celtic (10%), Serbian (8%) and other cultures (10%) also represented. The class that formed the focus of the study consisted of 27 children: 12 girls and 15 boys. Most of the students were from a Vietnamese background (17 students), with 5 Chinese, 2 Samoan, 2 Anglo-Celtic and 1 South American.

Popular culture can provide a bridge between home and school literacy. Children’s magazines, such as Disney Adventures, K-Zone and D-Mag, are more appealing to the students than newspaper texts, as the magazines are relevant to the students’ culture outside the school. Thus, these magazines were chosen to focus on in the classroom, a choice which demonstrates value for the texts they read and promotes outside school literacy practices.

Other reasons for choosing children’s magazines were because the texts were easier for the students to comprehend as they dealt with topics they had greater knowledge of and were at a more appropriate reading level.
The magazines were available in local supermarkets. Children had seen these magazines and some had read them at home. Thus, the students as the target audience for the magazines would benefit from the deconstruction and critique of the texts.

3 Pedagogical models for multiliteracies

Students are not passive learners; they are active both as constructors of knowledge and in their conceptual learning. In the process of teaching and learning, teachers assist students to move beyond what they can achieve at the present, scaffolding their learning (Vygotsky 1978; Bruner 1985; Hammond 2001). In an attempt to assist teachers to scaffold student learning and to teach about text more explicitly, including multimodal texts, a number of curriculum models have been proposed. I will consider only a small range of these with a focus on the Australian context.

Pedagogically, a genre-based approach to teaching and learning, called the Curriculum Cycle (e.g. Callaghan and Rothery 1988; Murray and Zammit 1992; Hammond 2001) and the work of the New London Group (NLG) (New London Group 1996) have been significant in developing approaches that involve systematic and explicit teaching of texts. The teaching about texts occurs within a curriculum context linking the focus of the content with the learning of an appropriate text or genre.

Researchers in the pedagogy of multiliteracies include the NLG (Cope and Kalantzis 2000), Unsworth (Unsworth 2001), Zammit and Downes (Downes and Zammit 2001; Zammit and Downes 2002) and Anstey and Bull (Anstey and Bull 2004). All these approaches have an emphasis on explicit teaching, involving scaffolded learning of any mode of representation for students within a meaningful context. They attempt to help teachers to plan for the integration of texts, using any mode, into the curriculum.

The New Learning Environments (NLE) curriculum framework (Figure 3.1) (Downes and Zammit 2001; Zammit and Downes 2002) attempts to meld both an explicit and systematic pedagogy with the learning processes associated with a range of texts across diverse mediums. Within the NLE framework teachers support students learning about the processes of using, locating, comprehending, critiquing and creating visual, written, aural and multimodal texts across live, paper-based and electronic mediums. This does not all occur at the same time in a classroom but over time within the curriculum and the pedagogy employed. An additional component of the framework, not represented in Figure 3.1, is the pedagogical stages of scaffolded, collaborative and independent working (Zammit 2002). The implementation of the NLE curriculum framework enables technology to be integrated in a meaningful, authentic manner. Its use is seen by students as a resource tool that can enable them to locate information and create and manipulate multimodal texts, rather than as a set of separate, decontextualized skills to be learnt (Lankshear et al. 2000; Snyder 2002).
4 The texts in children’s magazines

We focused on three children’s magazines, *Disney Adventures*, *K-Zone*, and *D-Mag*, investigating their target audience, the types of texts found in the magazines, and their purpose. Explicit teaching, learning and critique of the text types of feature articles, reviews, procedures and fun pages was conducted. For this chapter, I focus on the feature articles, as space precludes the analysis and presentation of all the genres included in the overall programme. I provide a brief overview of the main features of feature articles in children’s magazines, and then present some of the tasks that the students completed. The selection of visual features to be presented is based on the visual grammar introduced to the students during the project, and which formed the basis of the development of the students’ visual metalanguage – colour, shots, layout, salience and framing (Kress and van Leeuwen 1996).

The texts within the magazines all use similar visual features. A design of difference is employed within children’s magazines and across issues of the same magazine. This means that pages are designed to not look alike within an issue, each page being visually distinctive. One effect is the pages look ‘busy’ to adult and child readers. In addition it means that change occurs across issues so the magazine does not always have the same ‘look’.

Figure 3.1 New Learning Environments curriculum framework
5 Feature articles in children’s popular magazines

Feature articles in children’s popular magazines inform the readership about people or characters relevant to their interests, for example, famous people such as pop stars, actors, wrestling champions, or characters (human or non-human) in films, cartoons and television series. The image is normally a photograph of the person, who is written about in the feature article, or of something related to them, for example photographs of the characters from the Harry Potter movie in an interview with J. K. Rowling. Feature articles are most often double page spreads, though they can be single pages. In the example analysed below, the double page spread is read as a single integrated entity (Kress and van Leeuwen 1996: 183). In children’s magazines two types of feature articles can be recognized: i) the question and answer (Q&A); and ii) the descriptive writing format (descriptive).

Feature articles are composed of the basic elements of: heading, by-line (in descriptive format only), blurb, sub-headings (descriptive format) or questions (Q&A format) with blocks of written text, image/s of people or characters, on a coloured background. The 'blurb' is an introductory section usually placed near the title but may be in another prominent position distinguishable by colour and/or framing. The blurb orients the reader to the article, telling who is being written about, why they have been chosen for a feature article, or what the focus of the article is. For example:

Get ready to spin out! The Web slinging super-flick of the year has arrived. We talked to the stars of the film and got all the gossip from the set! (K-Zone, June 2002: 34)

Feature articles in children’s magazines employ a structure of nucleus and satellites, similar to a news story in a newspaper (Iedema et al. 1994). The heading + blurb + (optional) by-line + (optional) image forms the nucleus of the article, providing a reader with the article’s focus. The paragraphs of subheading/question + written text blocks or the image/s are satellites, providing the reader with information about the person or character in focus. The separate satellites do not necessarily appear in a specific order on the page.

The descriptive writing format may contain an additional element: a fact file. It is a summary of the person or character’s biographical details selected by the writer. For example, it may contain when and where they were born, how many siblings they have, etc. The text is about the person or character, informing the readership about them as an entity. For example, Figure 3.2 shows a mock-up of a feature article about Kylie Minogue, Kylie Fever!, which appeared in Disney Adventures, June 2002: 38–9 (the original article could not be shown for copyright reasons).

Colour is of great significance in children’s magazines, as it is used to create meanings: to convey messages, engage the reader and consolidate meanings within a text (Kress and van Leeuwen 2002). Highly saturated colours are often used for the backgrounds, creating sometimes a psychedelic 1960s style, flower power of the 1970s, or even a surreal mood. These
colours are used to contrast with the colour of the writing, drawing the reader’s attention, attracting them to read or at least to have a look. The written text blocks are part of the visuals, generally black or white, but this may vary according to the type of text. The colour for sub-headings or questions usually contrasts with the background or links with another element on the page, for example the colour of the heading. In this way colour is used to create unity and coherence in the text (Kress and van Leeuwen 1996: 349). In the ‘Kylie Fever’ article, the written text block and the image are placed on the same pale grey coloured background creating an associative link between the two elements; in other words, the writing and image go together. In addition the word ‘Kylie’ is in white font to match with Kylie’s dress, while the pink font of the by-line and the word FEVER create a coherent link with the background colour used for the blurb and the ‘Kylie Facts’ written text.

Colours, including those of clothing, are also used to denote specific aspects of the person or character (Kress and van Leeuwen 1996: 347). Backgrounds can be a specific context, dark colours or occasionally a pale colour. The choice of background for a specific artist in an article can be used as an analogy to the type of person they are. For example, in the ‘Kylie Fever’ article, both the background and the clothing are pale colours (light grey, pink and white); the pink background and writing are both soft colours associated with femininity. The pink stereotypical feminine colour...
links to the feminine, sweet and fun-filled (although also sensual) large image of Kylie.

Selection of colour can also have an impact on the feelings of the reader, drawing an emotional response to the text (Kress and van Leeuwen 1996: 348). The colours used to denote who Kylie is extract an emotional response from the reader as well as tie the text together. The choice can also be distracting when the colour for the background means the written text is absorbed and difficult to see and hence read. At times it seems that the dominance of the colour background, style or image are designed to attract the reader’s attention creating an emotional reaction in the reader and a desire to engage with the text, but not for the article to be actually read by anyone, especially the young targeted audience as all you can see are the colours not the words. The students taking part in the project commented on this point in the initial discussion of the texts in children’s magazines (see section 4). They could not resolve in their minds this choice of design, as they could not read the words easily when they were the target audience.

The layout or composition of the page is designed to draw the reader to particular parts of the text – the heading, the image/s, the written text block. Headings are usually large and bold and placed at the top of the page, as in the ‘Kylie Fever’ feature article (Figure 3.2). Images and the written text blocks may be placed on either the right or the left side of a page or at the top or bottom. If an image is placed on the left side, the space of the Given, it is assumed to be known to the reader and of lesser importance than the elements placed on the right side, the space of the New and the area the reader should pay particular attention to, as this is where the more important elements are located (Kress and van Leeuwen 1996: 186). If an image is placed in the bottom half of the page then often the heading is also placed at the bottom. In most feature articles, images take up roughly half the page, the other half devoted to written text. Pages may consist of more images than written text; the opposite case is less likely to occur. The power of the visual is a dominating factor in feature articles, enticing the reader into the text.

In the ‘Kylie Fever’ article, the image is on the right side, showing the ‘new’ look of Kylie and foregrounding her look as the important element in the article. The fact file is also placed in a prominent position on the right. This means that the summary is more likely to be read over the rest of the written text if a reader is browsing the magazine. On the left side is the bulk of the writing: the heading, by-line, blurb and written text block. It is secondary to the image and fact file and least likely to be read, except the huge heading, which draws the reader’s attention. This reinforces the notion of the image as most influential on readers. It is more important to see Kylie and what she is like than to read all about her.

Size of an image and/or the use of colour attract the focus of a reader’s attention on a part of the feature article. This privileging of one part can create a ‘hierarchy of importance among the elements, selecting some as
more important, more worthy of attention than others’ (Kress and van Leeuwen 1996: 212). Salience is realized through size, colour, colour contrasts, tonal contrast and placement on the page, drawing the reader’s gaze to an element on the page (Kress and van Leeuwen 1996). The size of the image can make it the most salient on a magazine page purely because it takes up so much of the page and appears to dominate over the written text. The written text blocks normally use very small font, making them the least salient element.

In the ‘Kylie Fever’ article, the image of Kylie and her name are the most salient elements on the page. The size of both elements captures the reader’s attention. The heading is extremely large consisting of two words. The largest in white dominates the top left half of the page. It is the first name of the person the feature is about: ‘Kylie’. No other name is necessary, as she is so famous for the targeted audience.

6 Developing students’ understandings of texts in children’s magazines

A variety of scaffolding approaches were utilized to focus on, analyse and critically reflect on the purpose, style, audience, structure, layout, organization and grammatical features of the different multimodal texts found in children’s magazines. For example, we employed explicit teaching as a whole class, demonstrating how to complete a task: building knowledge about the text, deconstructing texts as a class, and introducing visual and written metalanguage, and completing tasks in a group with peer support while the class teacher, researcher and support teacher (when in the class) provided guidance and support for groups and questioned students to determine their understanding. The use of whole class teaching, deconstruction and/or joint completion of all or part of an activity took place before students independently undertook tasks, in pairs or small groups.

In addition the teacher employed the use of three of de Bono’s Six Thinking Hats (de Bono 1986): the yellow (what we like), green (what we would like to change, or suggestions for our magazine) and black (what we don’t like), in an activity to provide students’ with a means to voice their opinions about the magazine texts. Colour was an important aspect of the magazines for the students. Some thought the difference in colours and variety of styles was a positive aspect while others believed it was a negative. Most of the students did not like the size of the written text block, commenting that it was too small. They also did not appreciate the designer’s choice of colour if they couldn’t read the written text, as mentioned in section 5.

7 Learning about the language of feature articles in children’s magazines

During the scaffolding of the structure of the multimodal texts in the children’s magazines, students were actively engaged with learning a metalanguage to talk about the visual + written texts, as presented in
section 5 on feature articles. The metalanguage was introduced in a meaningful way to students through the investigation and analysis of the children’s magazine texts.

In relation to the written text in Q&A feature articles the class learnt about the two different types of questions: the Yes/No interrogative and the WH-interrogative. These were called closed and open questions. Examples were identified and questions in the magazines were discussed. One of the tasks involved pairs of students completing a Q&A matching activity, where they had to match the jumbled up answers to the questions from a feature article called ‘Here’s Harry! Exclusive Interview!’ (Disney Adventures, June 2002: 36). As they pasted the questions and answers onto the A3 sheet with the nucleus on it (heading, blurb, image), they had to consider the sequence the questions may have been asked in and take this into consideration when reconstructing the text. Once this was completed, they justified their organization and then compared their reconstruction to the original. Another activity, as a class, involved the creation of questions to ask Daniel Radcliffe, the actor who plays Harry Potter, that would provide an interviewer with information beyond that of closed questions, which would give a Yes/No answer only. Students and teacher provided support for those who suggested a closed question in order for them to change it into an open question or rephrased the question for them to create a WH-interrogative. These questions formed the basis of the creation of a jointly constructed interview with Daniel Radcliffe, with students locating answers from the magazines and other sources before the joint construction.

In relation to the written text in descriptive feature articles the class investigated fact and opinion statements, main ideas in paragraphs and the way in which reporters would have obtained information for the article. For example, the teacher and class (and then the students in pairs) identified the use of facts and opinions in the Kylie text. The students were introduced to analysing a statement and determining if the information was factual or contained opinion words or points that people may not all agree with. The students then completed a worksheet containing sentences from the Kylie text to identify if the statement was a fact or an opinion. For example Kylie’s latest album is called Fever and was released in the US earlier this year is a fact that can be checked, whereas Kylie’s new CD, Fever, is hot! is an opinion because it uses the opinion word ‘hot’ and not all people would agree with this statement.

To ascertain students’ understandings about descriptive feature articles, students worked in groups to label as many elements on a feature article, its structure and language features, and to write some points about:

- How may the information for the feature article have been gathered?
- How is the information organized? (What is each paragraph about?)
- Why are there subheadings within the text?
- How have fact and opinion been used?

After reading a number of feature articles the class came up with a list of
topics that could be included in a ‘feature article about famous people’. To summarize the learning about feature articles, the teacher constructed a chart ‘How to Write a Feature Article: Descriptive Writing Format’. This was worked through jointly with the class on the actor Daniel Radcliffe.

8 Learning about the visual construction of feature articles in children’s magazines

Students recognized that feature articles contained a significant image and a large heading. They considered the written text as a visual element, pointing out the size of the heading and other written text, and the use of bold, italics and different colours. In their analysis, overlap of the concepts related to visual literacy was apparent, since it was difficult at times to separate out the concepts as they impacted upon each other. This happened, for example, in the interpersonal reaction to colour associated both with salience and with framing.

As a class we looked at an example of a feature article and identified what caught their eye first and how; the colours used, the impact of the colour selection and how colours impacted on their understanding of the text; the type of image used and its placement in comparison to other elements; and finally, the written text. We also discussed how all of these combined to send messages to a reader. After completion of this activity as a class, students in groups were given a large piece of paper with a feature article, a set of probe questions and a statement to focus their analysis of their article.

For example, the group who analysed the ‘MIIB’ article (Disney Adventures, August 2002: 46) stated the following in response to the task:

What is the first thing you see? *The image of Will Smith or the bold heading; the strong black heading*

What kind of image is used? (a photograph or illustration) *picture*

Where is the image placed on the page? *It fill up 1 or the left page*

What does the text look like? (size, layout, font, style) *Font – big; the picture take [sic] up half the page; the picture is cool*

What colours can you see? *Black, white, grey, silver and brown*

Describe the colours you see. *The colours are dark and bright*

What don’t you like about the page? (Black Hat) *Not enough writing.*

What do you like about the page? (Yellow hat) *The gun and the picture is mad. The colour of the picture is cool.*

During the sharing session that followed the group activity, students elaborated on their written answers and comments. The teacher also sought clarification and asked probing questions to assist students to further articulate their understandings. Many of the students used the
metalanguage of visuals they had been introduced to and used during lessons. To further focus students’ attention on the concept of layout, paper-based and electronic manipulations of a feature article were implemented. The paper-based manipulation required students to cut out the elements of a feature article, select coloured paper for the background, place the image and written text on the page and use other colours if they wished to decorate or create a different look for their page. When asked about their decisions, students spoke of placing the heading at the top to gain the reader’s attention and of using bright colours to also gain attention and make the page appealing to view. Students commented about how they thought they had done: for example, *The colour of the background is red because it suited the text and picture and I think my feature article is in a suitable order and position because it looks like a real feature article.* The teacher responded to students’ work using the metalanguage as well, for example *Good work P! I liked the colours chosen and the way you showed the question in yellow and Fantastic C! I love your layout and background designs.*

In regard to electronic manipulation, the pedagogy employed initially involved students as a class learning about the tools of the program using the same task they would also complete in a small group. During the collaborative joint manipulation they used the same tools that were used during the class scaffolded learning session to create a layout for their page and then independently worked in pairs on the creation of a multimodal electronic text. One activity was a mock feature article, called Owl Inc., which enabled students to manipulate the written text in regards to colour, type of font, style and size. It contained a heading, written text blocks and an image for them to manipulate. For this session, students were shown how to change the font colour, style, size, and how to use Word Art to create a heading using the text provided. At the same time, the other tools previously introduced, for example, resizing images and text blocks, inserting backgrounds, were also reviewed. This activity enabled students to insert a background that went behind the written text and image blocks, something they were not able to achieve with the other creations. The use of bright, bold, eye-catching headings and backgrounds were a feature of the students’ multimodal texts. Students’ own feelings about colours, their reaction to the aesthetic qualities of colour, as well as the message they were trying to achieve contributed to their decisions. They did not articulate textual, cohesive links, as a reason for use of colour but this could be identified in their work. Some of the comments made by the students included:

* I put the illustration on the top right hand corner. I laid the blurb under the title and the text on the bottom of the page. I did my layout this way because I like red, blue, I like bold writing.

* I used Italic and bold writing for the text and change the size of the font so people can see the font better.
9 Employing their knowledge of the multimodal genres in children’s magazines

Simply analysing and understanding the way texts are constructed is not an end in itself but a means to enable students to design, create and construct similar texts for their own purposes. To contextualize the learning they were undertaking, students knew that they were going to be involved in designing and publishing a class magazine. The production of the magazine involved students working in small teams to generate ideas for magazine articles. Teams set about researching, creating, drafting, editing and publishing their magazine articles. Students had to use different sources of information, conduct interviews and/or internet searches, make items or recipes, take digital photos and find relevant written and visual texts. Students had to use a variety of forms of technology to complete these tasks.

The multimodal texts created by the students reflected the learning in which they had been involved. Their comments and those of their teacher support the amount learnt about multimodal magazine texts. In addition the work demonstrated the importance of employing similar scaffolding techniques but also the reworking or addition of different scaffolding activities in the learning of the other magazine genres. Eventually students required less explicit teaching or scaffolding as they were confident about what was expected of them in a task.

When asked the question: *What sort of things have you thought about when deciding on the layout of your multimodal texts?*, their comments demonstrated the impact of the teaching/learning experiences they were involved in, especially the use of colour to convey meaning and the placement of elements on the page. For example, *colour important so it would suit the image; where the writing goes.* From the teacher’s perspective one important aspect of the project was the *‘authentic’ real world nature of learning* that informed the implementation of the programme.

10 Conclusion

A semiotic perspective, based on SFL, clearly enabled students to talk about the texts in a meaningful way. The knowledge of the grammar of visual and verbal texts also gave the teacher and students a means to engage in critical literacy practices (Luke 1999). A language to talk about texts in any mode, a metalanguage, can have great benefits for students from low socio-economic and different cultural backgrounds to the mainstream English schooling as it gives them control over the texts they read and produce.

Scaffolding their learning provided the access explicitly, supporting their learning directly. The NLE framework allowed planning to occur for the introduction and consolidation of relevant understandings, knowledge and skills. Students were given many opportunities to jointly and independently construct magazine genres as part of the activities leading up to...
producing a class magazine. Technology was an important aspect of the creation of these texts as it provided the students with access to the means of production of multimodal texts. It allowed them to transform the knowledge and understandings they had gained through the explicit teaching of multimodal texts into another context. The use of children’s popular culture provided the link between the world of school and the world of home, bringing relevance and authenticity to the school learning.

By the end of the year, students felt confident to talk about the visual, written and multimodal aspects of texts, using language in appropriate ways when describing, critiquing and creating multimodal texts. Links were being made between the purpose of a text and its visual/verbal construction. The learning about visual grammar, especially the use of colour, had a definite impact on students’ understanding and knowledge of children’s magazines. Although the students did not specifically use technical terms such as salience, Given/New, they spoke of these using more common sense language and employed their knowledge when creating multimodal examples. Understanding of the written component of the genres was obvious from the joint constructions and independent constructions of students, where they employed the organization and grammatical features of the genre that had been part of the explicit teaching cycle. Though these texts were not the standard, mandated ones from the state syllabus, this learning had clearly been consolidated.

As a result of students’ engagement in the multiliteracies project, there was a flow-on effect to other areas. In their books, they began to make decisions about how to compose the page for specific reasons related to what they had learnt. Students were extremely interested to take part in and have a go at tasks, which was not obvious prior to the commencement of the multiliteracies project. Students demonstrated increased persistence in their work, with a subsequent decrease in the amount of complaining about work. The highest impact occurred with the boys. They became more engaged in discussions, offered ideas and were generally more willing to participate in activities than previously. The use of children’s popular culture created a bridge to developing students’ understandings of how multimodal texts were created and how to use that knowledge in their own school literacy practices.

Notes

1 Co-researching refers to the equal power relation that exists between researcher and class teacher in the development, implementation and refinement of the research project.

2 The term ‘mediums’ is used to emphasize more than one medium and to not confuse ‘media’ with the content area of ‘media’ or ‘media’ literacy.

3 Student understandings about the target audience, purposes for and types of texts in children’s magazines were based on previous study of
texts in newspapers. Their newspaper work included how the texts found in a newspaper varied according to their purpose and how the different purposes influenced the organization and language features of the texts.

4 Not all the text types in children’s magazines were included in the implementation of the programme due to time constraints; for example, letters, cartoons, fun pages were not explicitly taught.

5 The students commented on the page having too much on it and being very busy, and on the difficulty of knowing where to start reading for some pages.

6 ‘+’ is used to denote ‘in addition’ as the elements are not placed in sequence but in space.

7 The italics are the group’s answer written using their spelling.

8 The layout work began with the feature articles but was also covered in construction of a review page and procedural texts.

References


**Children’s magazine texts**

Kylie Fever! *Disney Adventures*, June 2002: 38–9

Here’s Harry! Exclusive Interview! *Disney Adventures*, June 2002: 36

MIIB *Disney Adventures*, August 2002: 46–7

**Acknowledgement**

Thanks to the co-researching teacher Michelle Wilson and her class 4W for sharing their learning with me.
4 Systemic Functional Multimodal Discourse Analysis (SF–MDA) Approach to Mathematics, Grammar and Literacy

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1 Introduction

A systemic functional (SF) multimodal discourse analysis (MDA) approach to mathematical discourse is presented in this chapter with the view of exploring the literacy demands of secondary school mathematics. The SF–MDA perspective is based on Halliday’s social semiotic theory of language (Halliday 1978, 2002–, 2004a; Martin 1992; Martin and Rose 2003) which has been extended to other semiotic resources, including visual images, displayed art, music, action and mathematical symbolism (e.g. O’Toole 1994; van Leeuwen 1999; Martinec 2000, 2001; O’Halloran 2005). The SF–MDA approach is concerned with the theory and analysis of semiotic choices in printed and electronic texts, and three-dimensional sites (e.g. Kress and van Leeuwen 1996; Iedema 2003; O’Halloran 2004b; Ventola et al. 2004; Baldry and Thibault 2006; Royce and Bowcher 2006). At present, the growing interest in multimodal and multimedia literacies (e.g. Kress et al. 2001; Unsworth 2001; Kress 2003; Pahl and Rowsell 2006) is gradually shifting the focus of educational linguistics research (Hornberger and Hult 2006) into a new realm where language is considered in conjunction with the use of other semiotic resources (as evidenced also through the work presented by Painter, Zammit and Jones, this volume).

From the SF–MDA perspective, mathematics is conceptualized as a discourse which is constructed through the use of three semiotic resources: language, visual imagery and mathematical symbolism (O’Halloran 1999, 2003, 2005, 2006; Lemke 2003). The multisemiotic makeup of mathematics is evident in Figure 4.1, an example from a secondary high school mathematics textbook (Teh and Looi 2001: 198), where linguistic, visual
Example 6

A particle moves along a straight line AB so that, after $t$ seconds, its speed, $v$ m/s, in the direction AB is given by

$$v = 3t^2 - 15t + 20.$$ 

The corresponding values of $t$ and $v$ are given in the table below:

<table>
<thead>
<tr>
<th>$t$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$v$</td>
<td>20</td>
<td>8</td>
<td>2</td>
<td>$k$</td>
<td>8</td>
</tr>
</tbody>
</table>

Calculate the values of $k$ and $h$.

Taking 1 cm to represent 1 second on the horizontal axis and 1 cm to represent 5 m/s on the vertical axis, draw the graph of $v = 3t^2 - 15t + 20$ for the range $0 \leq t \leq 5$. Use your graph to estimate

(a) the value of $t$ when the speed is 10 m/s;
(b) the time at which the acceleration is zero;
(c) the gradient at $t = 4$, and explain what this value represents;
(d) the time interval when the speed is less than 15 m/s.

\[ \text{Solution} \]

![Graph showing the velocity-time curve for a particle moving along a straight line.]

When $t = 3$, $v = 3(3)^2 - 15(3) + 20 = 2$. \quad \therefore \quad k = 2

When $t = 5$, $v = 3(5)^2 - 15(5) + 20 = 20$. \quad \therefore \quad h = 20

(a) From the graph, $t \approx 0.8$ or 4.2 when speed = 10.

(b) The acceleration is zero when the gradient of the curve is zero. From the graph, the acceleration is zero at $t \approx 2.5$.

(c) A tangent is drawn at the point $t = 4$. From the graph,

\[
\text{gradient of the tangent} = \frac{15.0 \text{ m/s}}{1.7 \text{ s}} = 8.8 \text{ m/s}^2
\]

(The gradient of the tangent of the speed-time graph gives the acceleration of the particle at that instant.)

(d) The time interval for which the speed is less than 15 m/s is $0.35 < t < 4.65$.

Figure 4.1 Mathematical text (Teh and Looi 2001: 198)
and symbolic elements combine to form Example 6 and its solution. The SF–MDA approach to mathematics is concerned with four interrelated issues: (i) the development of SF frameworks to explore the functionality and grammatical systems for mathematical visual images and mathematical symbolism; (ii) the theorization of the meaning arising from the combined use of the three semiotic resources in written, printed and electronic mathematics texts; (iii) the investigation of the impact of computer technology on mathematics; and (iv) the development of new approaches to classroom discourse analysis to incorporate the range of semiotic resources which come into play; e.g. gaze, gesture, action, three-dimensional objects and the architectural features of the room. The study of linguistic discourse alone has theoretical limitations which have the potential to simplify and distort the actual nature of pedagogical practices in mathematics classrooms.

This chapter, however, is confined to a multimodal perspective of mathematical discourse itself; the written texts which students read, learn and reproduce at school. The areas of interest are (1) intra-semiotic, the functionalities and grammars for language, mathematical visual images, and mathematical symbolism; and (2) inter-semiotic, the meaning arising from the integration of linguistic, visual and symbolic elements in mathematics texts. The major focus of the chapter is directed towards theorizing intersemiosis in mathematical discourse where meaning is the product of linguistic, visual and symbolic choices. This investigation is undertaken with the aim of developing the concepts of mathematical discourse, grammar and literacy. Kress (2003: 35) extends the concept of literacy beyond language:

> We can no longer treat literacy (or ‘language’) as the sole, the main, let alone the major means for representation and communication. Other modes [i.e. forms of semiosis] are there as well, and in many environments where writing occurs these other modes may be more prominent and more significant. As a consequence, a linguistic theory cannot provide a full account of what literacy does or is; language alone cannot give us access to the meaning of the multimodally constituted message; language and literacy now have to be seen as partial bearers of meaning only.

Semiotic resources other than language are particularly significant in mathematics where the meaning potentials of mathematical symbolism and visual display are accessed, alongside language. One key aspect to theorizing mathematical discourse is understanding how meaning arises across selections from these three semiotic resources.

The theoretical separation of linguistic, visual and symbolic semiotic resources is an artificial construct, because, in reality, choices from each of these resources combine in mathematical discourse. For example, the linguistic text, the visual images and the symbolic statements are typically multisemiotic, as seen in Figure 4.1 where (i) the problem contains linguistic and symbolic elements; (ii) the graph contains linguistic and symbolic elements; and (iii) the remainder of the solution (apart from the graph) is a mixture of linguistic and symbolic choices. Mathematical
discourse integrates choices from the three resources at each stage of the text. For this reason, the major focus of the paper is directed towards conceptualizing intersemiosis and the meaning arising from the integrative use of linguistic, visual and symbolic choices in mathematical discourse. Only general observations are made about the individual functions and grammars for language, mathematical symbolism and visual imagery (for details, see O’Halloran 2005). The educational implications of the multimodal approach to mathematics in relation to literacy become evident in the ensuing discussion.

In what follows, a brief overview of the SF approach to language prepares the ground for the SF frameworks for mathematical symbolism and mathematical visual images. These two SF frameworks form the basis for an integrated a SF–MDA framework for mathematical discourse. Following this, the semantics of intersemiosis are explored in terms of contextualization (i.e. co-contextualization and re-contextualization) and mechanisms for intersemiosis. Metafunctionally-based systems for intersemiosis at the ranks of discourse and grammar are explored through examples from Figure 4.1. The discussion includes intersemiotic systems on the display stratum (i.e. the expression stratum), illustrating the need to take into account the material basis of semiosis. It becomes evident from the discussion that existing SF approaches to language are insufficient for modelling multimodal phenomena. In today’s increasingly visual and multimedia culture, the need to develop theoretical and analytical approaches to multimodal discourse becomes more pressing.

2 Halliday’s systemic functional (SF) social semiotic theory

Social semiotics is the study of socially-based sign systems which function as communicative resources for making meaning in a culture (for example, Halliday 1978, Kress and Hodge 1988; van Leeuwen 1999, 2005). The meaning of a sign is not pre-given, rather it depends on the situational and cultural context of use. In this chapter, multimodal refers to the multiple modes (i.e. spoken, written, printed, digital and audio texts, embodied action and three-dimensional material sites) through which social semiosis takes place. SF social semiotic theory (Martin 1992; Martin and Rose 2003; Halliday 2004a) provides a comprehensive theoretical platform for multimodal discourse analysis (MDA) aimed at investigating the meanings arising from the integrative use of semiotic resources in mathematical discourse and the classroom. Given its central role for developing a SF–MDA perspective, the main ideas of Halliday’s (1978, 2004a) social semiotic theory are outlined below.

Semiotic resources are seen as multifunctional from the SF perspective. That is, experiential and logical relations are construed through semiotic choices, while, simultaneously, social relations between the interactants are established, maintained and negotiated. Semiotic resources have grammatical systems through which these functions are fulfilled, including
systems for textual meaning which function to organize the message. Halliday (2004a) provides a comprehensive description of the systems constituting the lexicogrammar of the English language for the four metafunctions of language: i.e. experiential, logical, interpersonal and textual. Martin (1992; Martin and Rose 2003) extends the SF model of language through the formulation of discourse systems which operate at the level of paragraph and text. In each case, the basis for the SF descriptions is semantic, rather than formal. That is, SF discourse analysis is concerned with the nature of metafunctionally-based linguistic choices, which may be contrasted with other possible choices. The SF lexicogrammar and discourse systems are organized according to a constituent rank scale (see Table 4.1).

Previous efforts at systematizing language and other semiotic resources, for example, Chomksy’s formal descriptions of language, and Bouissac’s description of kinetic behaviour (see Freedman 1981), encounter the problem of the relationship between form and meaning. That is, formal descriptions of semiotic choices – as opposed to the SF semantic descriptions – are divorced from the functional semantics of those choices. The basis for theorizing and analysing multimodal texts from the SF–MDA perspective, however, is the metafunctional principle which overcomes the form/meaning problem, and simultaneously provides a platform for viewing the meaning arising from the integration of semiotic choices through the concept of contextualization. That is, semiotic choices contextualize each other to create new meanings. Baldry and Thibault (2006: 23) explain:

Rather than speaking of different channels or ‘codes’, the metafunctional basis of semiosis suggests that different resources are integrated on the basis of the meanings which are created through the synergy of and co-contextualizing relations between modalities. The meaning of the multimodal texts is the result of the often complex ways in which different resources work in partnership.

Halliday’s (2002, 2004a) social semiotic metafunctional theory provides a comprehensive theoretical foundation for SF–MDA. The challenge,
however, is to model the functionality and systems of semiotic resources other than language, and to explore the meanings arising from the interaction between semiotic choices. Baldry and Thibault (2006) take a substantial step in this direction by introducing a theory and practice for multimodal transcription and text analysis for printed pages, web pages, websites and film texts. As will become evident in the ensuing discussion, this requires moving beyond the forms of description for linguistic systems (e.g. metafunctional system networks with syntagmatic realization statements) and the traditional approaches to discourse analysis developed for the study of language.

3 SF–MDA: theoretical frameworks

I now present SF frameworks for mathematical symbolism and visual images and then develop an integrated SF–MDA framework for mathematics. The frameworks are illustrated through examples from Figure 4.1. Given space constraints, the functions of mathematical language are not discussed (see Halliday and Martin 1993; Halliday 2004b; O’Halloran 2005), other than to say language has a significant role in terms of introducing, describing and contextualizing the mathematics which is developed (e.g. see Figure 4.1). The semantic advances made possible in mathematics through the integrative use of mathematical symbolism, visual images and language provide the focus of this chapter.

3.1 SF framework for mathematical symbolism

The SF framework for mathematical symbolism displayed in Table 4.2 is based on Halliday’s (2004a) lexicogrammar and Martin’s (1992; Martin and Rose 2003) discourse systems for language. The display stratum, which corresponds to the expression stratum for language, is concerned with the material (i.e. actual) symbolic text. The close connection between language and mathematical symbolism lies in the fact that the latter is a sign system which in part evolved from language. The intimate

<table>
<thead>
<tr>
<th>MATHEMATICAL SYMBOLISM</th>
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<tbody>
<tr>
<td>CONTENT</td>
</tr>
<tr>
<td>Inter-Statemental Relations</td>
</tr>
<tr>
<td>Grammar</td>
</tr>
<tr>
<td>Statement (clause complex)</td>
</tr>
<tr>
<td>Clause ( / / / )</td>
</tr>
<tr>
<td>Expression ( [ [ ] ] )</td>
</tr>
<tr>
<td>Element</td>
</tr>
<tr>
<td>DISPLAY</td>
</tr>
</tbody>
</table>
relationship between linguistic and symbolic forms of semiosis is evident from the ways in which two resources combine in Figure 4.1 (e.g. A particle moves along a straight line AB so that, after \( t \) seconds, its speed, \( v \) m/s, in the direction of AB is given by \( v=3t^2-15t+20 \)).

Following Halliday’s SF grammar for language, the grammatical framework for mathematical symbolism in Table 4.2 is based on a rank scale. For example, \( v=3t^2-15t+20 \) is a clause consisting of the relational identifying process = and participants \( v \) and \( 3t^2-15t+20 \). Participants in mathematical symbolism are often rankshifted expressions, indicated by [[ ]] (e.g. \([[[(3t^2)-15t]+20]]\)). Expressions consist of elements (e.g. 3, \( t \), 15 and 20). A series of linked clauses forms a statement (e.g. When \( t=3, \ v=3(3)^2-15(3)+20=2 \), \( k=2 \)). Inter-statemental relations exist at the rank of discourse. For example: ‘Use your graph to estimate (a) the value of \( t \) when the speed is 10 m/s’ links the question in Figure 4.1 to the graph, which is linked to the solution (i.e. (a) From the graph, \( t=0.8 \) or 4.2 when speed=10). Such inter-statemental relations, where the discourse shifts from question (a) (linguistic/symbolic) → the graph (visual) → solution (a) (linguistic/symbolic), reveal that discourse systems are potentially intersemiotic systems. The need to analyse such intersemiotic discourse moves is evident, and one question which subsequently arises is the existence of other forms of intersemiotic systems. In the SF–MDA framework (see Table 4.4), it is proposed that intersemiosis can take place at each rank in the content stratum, and on the display stratum. This proposal is presented in section (c) SF–MDA theoretical framework, and developed in the remainder of the chapter.

O’Halloran (2005: 94–128) provides a preliminary description of the metafunctionally organized systems constituting the grammar of mathematical symbolism. The grammatical systems are not reproduced here, because the emphasis is directed towards the theorization of intersemiosis. However, general observations concerning the metafunctional orientation of mathematical symbolism are made, with reference to Figure 4.1. The discussion is concerned with textual, interpersonal and ideational meanings of mathematical symbolism. A similar overview of mathematical visual images follows, in preparation for the presentation of the SF–MDA framework.

The textual organization of mathematical symbolic texts is regulated at each rank, from elements to the complete text. In Figure 4.1, system choices include spatial positioning for organizing the problem and the solution; the information in the table; (a), (b), (c) and (d) in the questions and answers; statements and clauses (e.g. \( v=3t^2-15t+20 \) is centred on the next line); and expressions and elements (e.g. the superscript in \( t^2 \)). In addition, the symbolic/linguistic text includes marked textual organization of clauses (e.g. . . . after \( t \) seconds, its speed, \( v \) m/s in the direction AB is given by \( v=3t^2-15t+20 \)) and clause complexes (e.g. When \( t=3, \ v=3(3)^2-15(3)+20=2 \)). The generic organization of the mathematics text, including other choices on the display stratum (such as italic font for variables) separates and makes prominent the symbolic text.
Interpersonal meaning primarily consists of statements and commands which are often hybrid mixtures of linguistic and symbolic elements (e.g. Taking 1cm to represent 1 second on the horizontal axis and 1cm to represent 5 m/s on the vertical axis, draw the graph of $v=3t^2-15t+20$ for the range $0 \leq t \leq 5$). The tenor remains constant as unmodulated commands are issued and information is given. Degrees of uncertainty are realized as unmodalized relational statements of probability and approximation (e.g. $t=0.8$ or $4.2$). The result is maximum modality which provides a sense of unchallengeable authority and certainty. In addition, the style of the symbolic font arising from specialized software programs reinforces the maximal modality. Mathematical symbolic texts maintain steady and direct interpersonal relations with the reader, a strategy which provides a stable environment for the unimpeded exchange of information and the issuing of commands.

The organization of the symbolic text and the consistency of the interpersonal relations provide a backdrop for foregrounding ideational meaning. The selection of relational and operative mathematical processes and circumstances for experiential meaning (e.g. $v=3t^2-15t+20$ for the range $0 \leq t \leq 5$) means that activity sequences unfold within a semantic domain largely concerned with relations between mathematical participants. These relations, preserved in the rankshifted expressions, are rearranged to solve problems. The strength of the mathematical symbolism is an economy of expression which is unambiguous in meaning. The economy takes place through specialized systems (e.g. spatial positioning, use of brackets and generic symbols, and the rule of order through which the processes unfold). Experiential meaning is unquestionably clear and concise in mathematical symbolic texts. The primary function of the symbolism is logical meaning, and the derivation of results with respect to the experiential relations which are encoded. Logical reasoning is based on established results which are not usually made explicit (e.g. algebraic laws and the rule of order are used to derive the answer ‘When $t=3$, $v=3(3)^2-15(3)+20=2 \therefore k=2$’). The vertical nature of mathematical knowledge (Bernstein 2000; O’Halloran 2007) and the specialized grammar of mathematical symbolism must be taken into account in approaches to mathematical literacy.

3.2 Mathematical visual imagery

The SF model for mathematical visual imagery is based on O’Toole’s (1994) framework for paintings (see Table 4.3). The grammar consists of a rank scale, where Figures (composed of Parts) are involved in an Episode which may be part of a larger scene involving other Episodes. The Work/Genre (e.g. abstract graphs, statistical graphs and geometrical diagrams) may form part of larger Inter-Visual Relations, for example, where a series of graphs or diagrams are presented. The expression stratum is called the graphics stratum (Lim 2004), which is concerned with
the material visual image. O’Halloran (2005: 129–57) provides a description of the metafunctionally organized systems for mathematical visual images. These grammatical systems are not reproduced here, but general observations about the functionality of mathematical visual images are necessary before intersemiosis can be explored. Illustrative examples are drawn from the graph in Figure 4.1.

Mathematical visual images are multisemiotic texts which are composed of visual and symbolic elements, and possibly linguistic choices, as seen in the graph in Figure 4.1. The mathematics image makes visible the relationship which is symbolically encoded (e.g. abstract graphs and statistical graphs), or alternatively, the image displays the relationship of the parts to some whole (e.g. geometrical objects and statistical displays). In essence, mathematical visual imagery is the art of making patterns of relations immediately discernible to the reader, and so the image functions to foreground experiential and logical meaning. In order to achieve this functionality, mathematics images are organized according to generic conventions, which today are generated through software programs. This involves the explicit framing of the relationship which is displayed so that each point bears a direct relationship to every other point, a relationship which can be described symbolically. Thus the textual organization of mathematics image is carefully scripted.

Interpersonally, the de-contextualized nature of mathematical visual imagery creates a context where the focus of the exchange is directed towards the mathematical relations which are portrayed (e.g. the curve in Figure 4.1). The modality is high, and the images produce an unrivalled degree of certainty which is not found in other genres of visual imagery. The patterns of interpersonal meaning are reinforced by the generalized symbolic nature of the participants, and the style of production on the graphics stratum. The shifting nature of interactions in the social world of the everyday is replaced with the steady calm abstract realm of the mathematical. One result is a direct focus on ideational meaning where a glance

<table>
<thead>
<tr>
<th>CONTENT</th>
<th>Discourse Semantics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inter-Visual Relations</td>
</tr>
<tr>
<td></td>
<td>Work</td>
</tr>
<tr>
<td>Grammar</td>
<td>Episode</td>
</tr>
<tr>
<td>Figure</td>
<td>Part</td>
</tr>
</tbody>
</table>

Table 4.3 SF Framework for Mathematical Visual Imagery

MATHEMATICAL VISUAL IMAGES

| DISPLAY | Graphics |

<table>
<thead>
<tr>
<th>CONTENT</th>
<th>Discourse Semantics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inter-Visual Relations</td>
</tr>
<tr>
<td></td>
<td>Work</td>
</tr>
<tr>
<td>Grammar</td>
<td>Episode</td>
</tr>
<tr>
<td>Figure</td>
<td>Part</td>
</tr>
</tbody>
</table>

| DISPLAY | Graphics |
is sufficient to pick up relevant information about the patterns of the mathematical relations which are visually displayed.

In terms of experiential meaning, the mathematics image makes visible the relations in such a way that Parts are related to other Parts in the Work, and spatiality is combined with temporality (e.g. Figure 4.1). The continuous flow of abstract relationships may be suspended at any point of time (e.g. ‘acceleration = 0’ in Figure 4.1). Significant instances are marked on the graph through the use of arrows, and symbolic and linguistic labels (see Figure 4.1). As with the symbolism, there is no ambiguity with regard to the experiential meaning.

The mathematics visual image bears a relationship to perceptual reality so that the image is located within Peirce’s (1991) definition of an indexical sign system. The immediate perceptual aspect of the mathematics images means that it is an important tool for logical reasoning. This is evident in Figure 4.1 where the reader is called upon to ‘use your graph’ to answer the questions. The visual image displays the patterns and trends in a way which permits the viewer to see how the patterns unfold, and to locate significant points in those unfolding relations (e.g. ‘acceleration = 0’ in Figure 4.1). The semiotic means for suspending and exactly describing the relations, however, lies with the symbolism, the tool which has been specifically developed for this purpose. The importance of the visual image is increasing with advances in digital technology, a point which cannot be developed in this chapter.

This overview of the functionality of the mathematical symbolism and visual imagery serves to introduce the SF–MDA framework which forms the basis for describing the mechanisms and systems for intersemiosis between language, mathematical symbolism and visual images in mathematical discourse.

3.3 SF–MDA theoretical framework

The framework for the SF–MDA approach to mathematical discourse (based on O’Halloran 2005: 160) is given in Table 4.4. The framework follows Martin’s (1992; Martin and Rose 2003) approach to language, context and ideology. In what follows, I first develop the SF–MDA framework and then explore intersemiosis in mathematical discourse.

Mathematical discourse consists of a range of genres or text types, which extend from academic papers to books and exam papers. As Baldry and Thibault (2006) explain, texts are the result of multimodal choices which are both generic (i.e. with standardized patterns) and text specific (i.e. with variation). The mathematical textbook is a Generic Mix (see Table 4.4) consisting of micro-genres (O’Halloran 1996, 2004a) or Mini-Genres (Baldry and Thibault 2006) (e.g. laws, theorems, explanations, demonstration problems, questions, solutions and so forth). The Mini-Genres differ in terms of Registerial Mix, or field, tenor and mode selections arising from ideational, experiential and textual meanings respectively.
The Mini-Genres consist of Items (Kok 2004) which, in turn, consist of smaller multimodal Components. The Mini-Genres, Items and Components in Figure 4.1, displayed in Figure 4.2, are considered in detail below.

Figure 4.1 is the Mini-Genre of the demonstration problem with Items the Problem (Components: Statement of Problem Context, Table and Questions) and the Solution (Components: Graph and Question Answers). Items are discernible parts which are typically marked in terms of textual layout. For example, the Problem has the heading ‘Example 6’ and the Solution has the heading ‘Solution’. The Problem and Solution are framed using lines, and a downward arrow points to the solution. The layout is somewhat text specific and innovative. More typically, the heading ‘Solution’ would be aligned on the left-hand side of the page underneath ‘Example 6’. Apart from the textual arrangement, Items may also differ in
Example 6  

**Item: PROBLEM**

A particle moves along a straight line AB so that, after \( t \) seconds, its speed, \( v \) m/s, in the direction AB is given by \( v = 3t^2 - 15t + 20 \).

The corresponding values of \( t \) and \( v \) are given in:

<table>
<thead>
<tr>
<th>( t )</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>( v )</td>
<td>20</td>
<td>8</td>
<td>2</td>
<td>( k )</td>
<td>8</td>
<td>( h )</td>
</tr>
</tbody>
</table>

Calculate the values of \( k \) and \( h \).

Taking 1 cm to represent 1 second on the horizontal axis, draw the graph of \( v = 3t^2 - 15t + 20 \). Estimate

(a) the value of \( t \) when the speed is 10 m/s;
(b) the time at which the acceleration is zero;
(c) the gradient at \( t = 4 \), and explain what this value represents;
(d) the time interval when the speed is less than 15 m/s.

**Solution**

When \( t = 3, \ v = 3(3)^2 - 15(3) + 20 = 2, \therefore k = 2 \)

When \( t = 5, \ v = 3(5)^2 - 15(5) + 20 = 20, \therefore h = 20 \)

(a) From the graph, \( t = 0.8 \) or 4.2 when speed = 10.

(b) The acceleration is zero when the gradient of the curve is zero. From the graph, the acceleration is zero at \( t = 2.5 \).

(c) A tangent is drawn at the point \( t = 4 \). From the graph,

\[
\text{gradient of the tangent} = \frac{15.0 \text{ m/s}}{1.7 \text{ s}} = 8.8 \text{ m/s}^2
\]

(The gradient of the tangent of the speed-time graph gives the acceleration of the particle at that instant.)

(d) The time interval for which the speed is less than 15 m/s is \( 0.35 < t < 4.65 \).

---

**Figure 4.2** Mini-Genre, Items and Components (Teh and Looi 2001: 198)
terms of interpersonal meaning (e.g. statements and commands in the Problem and statements only in the Solution) and ideational content (the Questions and the Question Answers) (see Figure 4.2).

I propose that intersemiosis occurs on the content stratum for Mini-Genres, Items and Components at the rank of discourse semantics and grammar, as displayed in Table 4.4. In addition, I propose that intersemiosis occurs on the display stratum in regard to the materialization and layout of the text. Systems such as spatial positioning, colour and font style and size are considered to be systems which function on the display stratum. For example, the 6 in ‘Example 6’, the borders, the ‘Solution’ and the curve in the Graph in Figure 4.1 are brown in the original text. This choice functions intersemiotically to make Example 6 textually cohesive and to signal important information (e.g. the curve).

The SF–MDA framework for mathematical discourse accords with Baldry and Thibault’s (2006) formulation of a ‘scalar hierarchy’ for multimodal texts which allows for different kinds of units and relations at different levels. As they explain (2006: 144), levels and associated units and relations are not mutually exclusive because:

(a) larger-scalar units provide integrating contexts for smaller-scale ones;
(b) the different levels mutually interact with and constrain each other, they are not for this reason completely separable.

Smaller-scale units are not simply smaller parts or building blocks in larger wholes. Leakage across levels is part of the way in which a hierarchy of meaningful units and relations functions in discourse.

The SF–MDA framework in Table 4.4 provides the basis for investigating intersemiosis in mathematical discourse. The discussion is contextualized in relation to Baldry and Thibault’s (2006) recent formulations, and the concepts are illustrated through examples from Figure 4.1.

4 Intersemiosis

Understanding the phenomenon of intersemiosis lies at the heart of the SF–MDA approach to multimodality because, as Lemke (1998) explains, the effect on meaning is multiplicative. Semiotic choices combine in various ways to make meaning, and the most productive way to model the interactions and orchestrations of semiotic choices in static and dynamic texts poses a major challenge for multimodal discourse analysts. How are the metafunctional meanings played out across choices from the semiotic resources across the different levels? Baldry and Thibault (2006) address this complex question, and in doing so, take a major step forward with regard to developing conceptual and methodological practices for analysing multimodal printed pages, web pages and film texts. Before developing the mechanisms, strategies and systems for intersemiosis in mathematics discourse, I briefly outline Baldry and Thibault’s approach.

Baldry and Thibault (2006: 31) view static multimodal texts (e.g. the
printed page and some web pages) as clusters of items, objects and elements which are ‘spatially proximate thereby defining a specific region or subregion of the page as a whole’. Clusters differ according to scale, where larger scale items consist of interactions of smaller scale ones, which are variously called sub-clusters, clusters and super-clusters. The different scales of clusters interact through the ‘meaning compression principle’ which is ‘a principle of economy whereby patterned multimodal combinations of visual and verbal resources on the small, highly compressed scale ... provide semiotic models of the larger, more complex realities that individuals have to engage in’ (Baldry and Thibault 2006: 19). As such, meaning compression means that ‘[v]isual scanning of these [smaller scale] patterns may take mere seconds and places no burden on processing’ (ibid.). In other words, information is scanned in complex texts through the assimilation of lower scale clusters which are contextualized at higher levels.

The meaning compression principle is certainly at work in mathematical discourse. The Items and Components of Mini-Genres are very distinct, as seen in Figure 4.2. The Items (i.e. Problem and the Solution) and the Components of the Items (Statement of the Problem, Table, Questions; and Graph and Question Answers) are spatially separated. Furthermore, important elements within the Components (e.g. the equation \( v = 3(3)^2 + 15(3) + 20 = 2 \)) are spatially separated through line spacing and centring. Spatial distinctness in mathematical discourse is one factor which ensures the successful operation of the meaning compression principle. Experienced readers of mathematical discourse need only glance at visual and symbolic components to gain relevant information (Lemke 2003; O’Halloran 2005). The scanning process is aided by the metafunctional orientation of the mathematical symbolism and visual imagery which foregrounds ideational meaning. That is, the sophisticated textual organization (e.g. the use of space, headings and numbering) and the consistent nature of the interpersonal relations permit the ideation content of mathematical discourse to be foregrounded.

Baldry and Thibault’s (2006) formulations of the scalar dimensions of multimodal interplay are productive with regard to examining the co-contextualizing and re-contextualizing processes of intersemiosis which result in a convergence of meaning (i.e. parallelism) and/or a divergence of meaning (i.e. dissonance) (Royce 1998, 2002; O’Halloran 1999). The contextualizing processes in mathematical discourse are not left to chance. On the contrary, mathematical discourse is carefully crafted discourse which unfolds in a particular sequence (e.g. Problem followed by Solution consisting of the Graph and Question Answers in Figure 4.1). Transitions within and across Mini-Genres, Items and Components are a consistent feature of mathematics discourse. Lemke’s (1998) notion of multiplicity explains the outcome of the transitions: there is an expansion of meaning arising from the contextualizing relations which subsequently occur. One major basis for the expansion of meaning is the shift in the
metafunctional orientation of semiotic choices which have the potential to produce contextualizing relations (i.e. convergence and divergence) at different levels in the scalar hierarchy. This point is developed below.

The potential for contextualizing relations to occur in mathematical discourse is extensive because there are three semiotic resources which combine to form Mini-Genres, Items and Components through selections from four metafunctional sets of systems (with $Z_n$ options) on the content stratum (ranks of discourse semantics and grammar) and on the display stratum. In other words, semiotic choices are contextualized in relation to other semiotic choices at different levels in the hierarchy. That is, meaning $A'$ (semiotic choice/s $A$ in Mini-Genre $A$, Item $A$ and/or Component $A$) is contextualized with respect to meaning $B'$ (semiotic choice/s $B$ in Mini-Genre $B$, Item $B$ and/or Component $B$) to create meaning $C''$ from $C'$ (semiotic choice/s $C$ in Mini-Genre $C$, Item $C$ and/or Component $C$). The resulting metafunctional orientation of $C''$ may differ from $A'$ and $B'$. For example, ‘use your graph’ (linguistic: interpersonal command $A'$) links the graph (visual: experiential meaning $B'$) to answer ‘(a) From the graph, $t=0.8$ or $4.2$’ (linguistic/symbolic: logical and experiential meaning $C''$). Thus, there is intersemiotic interplay between metafunctions and ranks across Mini-Genres, Items and Components. More generally, the recursive

![Figure 4.3 Recursive nature of intersemiotic contextualizing processes](https://example.com/figure4.3.png)
nature of contextualizing processes in mathematical discourse is displayed in Figure 4.3.

Intersemiotic processes in mathematics result in expanded yet unambiguous ideational meanings. Intersemiosis takes place through various mechanisms, which have the potential to co-contextualize (i.e. converge) or re-contextualize (diverge) the meanings of semiotic choices and/or Mini-Genres, Items and Components. These mechanisms require further research, but from the following examples, it appears that intersemiosis in mathematics involves the re-contextualization of ideational meaning which produces divergence – and hence multiplicative expansion – of experiential and logical meaning. We may see the following intersemiotic mechanisms at work in Figure 4.1:

1. **Semiotic Cohesion**: System choices function to make the text cohesive within and across Mini-Genres, Items and Components. For example, there is a high degree of repetition involving co-contextualizing relations across the three semiotic resources (e.g. \( t \) seconds, \( t \), value of \( t \), \( t(s) \); speed, \( v \) m/s, \( v \), \( v \), \( v = \frac{t^2 - 15t + 10}{11} \), \( v(m/s) \)).

2. **Semiotic Adoption**: System choices from one semiotic resource are incorporated as system choices within another semiotic system. For example, symbolic elements appear in linguistic statements: e.g. ‘The corresponding values of \( t \) and \( v \) are given in the table below:’ and ‘Calculate the values of \( k \) and \( h \)’ (see Figure 4.4). In this example, the meaning of \( t \) and \( v \) are re-contextualized in relation to each other in the Table, and \( k \) and \( h \) are subsequently re-contextualized in relation to that new relationship.

![Figure 4.4 Semiotic adoption](image)

3. **Semiotic Mixing**: Items consist of system choices from different semiotic resources. For example, the symbolic and linguistic choices ‘acceleration = 0’ and ‘\( v = 3t^2 - 15t + 20 \)’ appear in the Graph (see Figure 4.5). This involves re-contextualization of the linguistic and symbolic elements in relation to the visual display of the curve in the Graph. The linguistic and symbolic elements are situated within a new semantic field; one involving visual semiosis.

4. **Juxtaposition and Spatiality**: Mini-Genres, Items, Components and constituent elements are compositionally arranged to facilitate intersemiosis:

(a) The spatial arrangement of the Statement of the Problem involves line spacing and centring which permits the symbolic equation to be
foregrounded as new and important information (see Figure 4.6). This involves co-contextualization of the linguistic description with the symbolic equation.

Figure 4.5 Semiotic mixing

A particle moves along a straight line AB so that, after t seconds, its speed, $v$ m/s, in the direction AB is given by

$$v = 3t^2 - 15t + 20.$$  

Figure 4.6 Juxtaposition and spatiality (a)

(b) The answer (c) involves line spacing and centring which permits the symbolic solution to be foregrounded as new and important information (see Figure 4.7). This involves co-contextualization of the linguistic description with the symbolic solution.

(c) A tangent is drawn at the point $t = 4$. From the graph,

\[
\text{gradient of the tangent} = \frac{15.0 \text{ m/s}}{1.7 \text{ s}} = 8.8 \text{ m/s}^2
\]

(The gradient of the tangent of the speed-time graph gives the acceleration of the particle at that instant.)

Figure 4.7 Juxtaposition and spatiality (b)

5. Semiotic Transition: System choices result in intersemiotic discourse moves called macro-transitions, which shift the discourse from one Mini-Genre, Item and Component to another. In addition, micro-transitions occur within Items. For example:

(a) In Figure 4.1, Macro-transitions occur from ‘… draw the graph of $v = 3t^2 - 15t + 20$ for the range $0 \leq t \leq 5$ and ‘Use your graph…’ in the Question, to the Graph itself, to ‘From the graph…’ in the Question
Answers. This involves semiotic transitions from the Questions (linguistic/symbolic) → to the Graph (visual) → Question Answers (linguistic/symbolic). This involves re-contextualization of linguistic, visual and symbolic elements.

(b) A micro-transition occurs in the shift from the linguistic/symbolic description ‘The corresponding values of \( t \) and \( v \) are given in the table below’ to the symbolic Table (see Figure 4.4). This example involves re-contextualization of the linguistic/symbolic formulation ‘the corresponding values of \( t \) and \( v \)’ to relational identifying processes between \( v \) and \( t \) in the Table. This intersemiotic shift of meaning is significant, and it is further investigated with respect to semiotic metaphor below.

6. Semiotic Metaphor: Metaphorical shifts occur where the functional status of elements is not preserved and new elements are introduced. For example:

(a) The nominal group ‘the corresponding values of \( t \) and \( v \)’ (Figure 4.4) is re-contextualized as a series of identifying relational clauses between the corresponding values of \( t \) and \( v \) in the Table (i.e. \( t \leftrightarrow v, 0 \leftrightarrow 20, 1 \leftrightarrow 8, 2 \leftrightarrow 2, 3 \leftrightarrow k, 4 \leftrightarrow 8 \) and \( 5 \leftrightarrow h \)). This involves a shift from a nominal (linguistic) group to a series of (symbolic) processes, a semantic drift which flows in the opposite direction to grammatical metaphor in language (Halliday and Martin 1993; Halliday 2004b).

(b) The identifying relations between the values of \( t \) and \( v \) established in the Table (Figure 4.4) become a single functional element, the point, in the Graph (Figure 4.5). The re-contextualizing relations in the shift from the Table to the Graph form the basis for the introduction of the new functional element, the curve. This involves a shift from a series of (symbolic) processes to a single (visual) entity.

It becomes evident that intersemiosis creates new semantic layers resulting from the contextualizing relations which take place. In particular, the re-contextualizing relations (of divergence) are significant because they mean that mathematics has the potential to reconstrue reality in ways which exceed the potential of language. The discussion suggests, however, that the re-contextualizing relations in mathematics may be metafunctionally-based, because the relations discussed above largely involve processes, participants and circumstances, or experiential meaning. In turn, these experiential relations permit the re-contextualization or expansion of logical reasoning. For example, temporality is combined with spatiality in the curve, and consequently the Graph is used as the basis for logical reasoning in the Question Answers. On the other hand, the textual organization makes the ideational content immediately apparent. As such, textual meaning functions to co-contextualize (i.e. converge) the re-contextualized ideational meanings. With regard to interpersonal meaning, it appears that intersemiosis in mathematical discourse functions to co-contextualize (i.e. converge) dominating social relations.
with high modality values across linguistic, visual and symbolic selections, thus providing a stable context for mathematical ideational meaning.

In summary, mathematical discourse involves:

- Intrasemiosis for accessing the meaning potential of language, visual imagery and mathematical symbolism.
- Intersemiosis in the form of co-contextualizing and re-contextualizing relations. Intersemiosis creates new semantic layers where the meaning of the re-contextualized ideational relations extend beyond that possible with language. The semantic realm is concerned with the descriptions of relations for the purposes of prediction and establishing causality (O’Halloran 2007). Co-contextualizing textual and interpersonal relations enable the new ideational content to be foregrounded.

5 Intersemiotic metafunctionally-based systems

The exploration of intersemiotic mechanisms suggests that metafunctionally-based systems for intersemiosis exist (see Royce 1998; O’Halloran 2005). Most certainly, Martin’s (1992; Martin and Rose 2003) discourse systems have the potential to function intersemiotically in multimodal texts (Martin 2002). Furthermore, the preceding discussion suggests that metafunctionally-based systems for intersemiosis exist at the rank of grammar and on the display stratum. Tentative preliminary frameworks for ideational intersemiotic systems, which require further research and development, are presented in Tables 4.5(a)–(b). The SF–MDA discourse systems are based on Martin’s (1992; Martin and Rose 2003) discourse systems of IDEATION and CONJUNCTION & CONTINUITY. The frameworks are illustrated by examples from Figure 4.1. SF–MDA intersemiotic systems for interpersonal and textual meaning (O’Halloran 2005) are not included because of space constraints.

The SF–MDA discourse system for experiential meaning in Table 4.5(a) is INTERSEMIOTIC IDEATION. For example, the Activity Sequence in Figure 4.1 (e.g. ‘Use your graph’ and ‘from your graph’) stretches across Mini-Genres, Items and Components. At the rank of grammar, TRANSITIVITY RELATIONS involve relational processes which assign values across different semiotic resources (e.g. after $t$ seconds, its speed, $v$ m/s, in the direction AB is given by $v=3t^2−15t+20$). This may involve LEXICALIZATION, SYMBOLIZATION and/or VISUALIZATION of the functional element in question (e.g. speed and $v$ m/s). Intersemiosis is aided by LABELS which are often multisemiotic (e.g. ‘acceleration=0’ with arrow in the Graph). On the display stratum, JUXTAPOSITION and the use of space create intersemiotic relations (e.g. relational identifying processes in the Table). In addition, FONT style (e.g. italics for variable $t$) and COLOUR (e.g. red points in the Graph to represent the relations in the Table) are systems which aid the intersemiotic expansion of meaning.

The SF–MDA discourse system for logical meaning in Table 4.5(b) is the INTERSEMIOTIC IMPLICATION SEQUENCE, which stretches across
Mini-Genres, Items and Components through the use of linguistic and symbolic conjunctions, conjunctive adjuncts and cohesive ties (e.g. ‘when’ and ‘.’ to calculate $k$ and $h$ in the Question Answers). At the rank of grammar, LOGICO-SEMANTICS & INTERDEPENDENCY establish inter-semiotic logical relations (e.g. use of arrow in the Graph). The INTERPLAY OF SPATIALITY & TEMPORALITY through visual, textual and symbolic transformations realizes logical meaning (e.g. relational processes in the Table are reconstrued as points on the Graph and the resulting curve is used in Question Answers). On the display stratum, SPATIAL POSITION is used to create a sequence of Items (e.g. Questions and Question Answers) and COLOUR aids logical reasoning (e.g. brown borders in the Table are linked to the brown curve in the Graph in the original text).

Table 4.5(a) SF–MDA Systems: The Experiential Metafunction

<table>
<thead>
<tr>
<th>Meta-function</th>
<th>Discourse</th>
<th>Grammar</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiential</td>
<td>INTERSEMIOTIC IDEATION</td>
<td>TRANSITIVITY RELATIONS</td>
<td>JUXTAPOSITION</td>
</tr>
<tr>
<td></td>
<td>Activity sequences and relations which span semiotic resources</td>
<td>Relational processes to set up identifying relations across semiotic resources</td>
<td>Use of space and position to create lexical, symbolic and visual relations</td>
</tr>
<tr>
<td></td>
<td>LEXICALIZATION, SYMBOLIZATION &amp; VISUALIZATION</td>
<td>FONTS</td>
<td>Use of font style, size and colour for experiential meaning</td>
</tr>
<tr>
<td></td>
<td>Functional elements are represented using semiotic resources</td>
<td>SEMIOTIC METAPHOR</td>
<td>COLOUR</td>
</tr>
<tr>
<td></td>
<td>Shifting in functional status of elements and introduction of new elements</td>
<td>LABELS</td>
<td>Use of Labels which use multiple semiotic resources</td>
</tr>
</tbody>
</table>

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Table 4.5(a) SF–MDA Systems: The Experiential Metafunction

| INTERSEMIOSIS ACROSS LANGUAGE, MATHEMATICAL SYMBOLISM AND VISUAL DISPLAY |
|---|---|---|
| Meta-function | Discourse | Grammar | Display |
| Experiential | INTERSEMIOTIC IDEATION | TRANSITIVITY RELATIONS | JUXTAPOSITION |
|               | Activity sequences and relations which span semiotic resources | Relational processes to set up identifying relations across semiotic resources | Use of space and position to create lexical, symbolic and visual relations |
|               | LEXICALIZATION, SYMBOLIZATION & VISUALIZATION | FONTS | Use of font style, size and colour for experiential meaning |
|               | Functional elements are represented using semiotic resources | SEMIOTIC METAPHOR | COLOUR | Use of colour for experiential meaning |
|               | Shifting in functional status of elements and introduction of new elements | LABELS | Use of Labels which use multiple semiotic resources |

Mini-Genres, Items and Components through the use of linguistic and symbolic conjunctions, conjunctive adjuncts and cohesive ties (e.g. ‘when’ and ‘.’ to calculate $k$ and $h$ in the Question Answers). At the rank of grammar, LOGICO-SEMANTICS & INTERDEPENDENCY establish inter-semiotic logical relations (e.g. use of arrow in the Graph). The INTERPLAY OF SPATIALITY & TEMPORALITY through visual, textual and symbolic transformations realizes logical meaning (e.g. relational processes in the Table are reconstrued as points on the Graph and the resulting curve is used in Question Answers). On the display stratum, SPATIAL POSITION is used to create a sequence of Items (e.g. Questions and Question Answers) and COLOUR aids logical reasoning (e.g. brown borders in the Table are linked to the brown curve in the Graph in the original text).
The formulations of SF–MDA systems for ideational meaning in Tables 4.5(a)–(b) are illustrative only. Further research is necessary to investigate the systems through which an expansion of meaning occurs through intersemiosis in multimodal texts (Kress and van Leeuwen 1996; Baldry and Thibault 2006). For example, Royce (1998) proposes systems for intersemiotic complementarity between linguistic and visual texts, and Martinec (2005) formulates systems for logico-semantic relations and status for text-image relations in old and new media. Such research is fundamental to developing SF–MDA aimed at theorizing and analysing multimodal texts.

6 SF–MDA analysis of Example 6 (Figure 4.1)

The formulation of intersemiotic mechanisms and systems sheds light on the functionality of mathematical discourse, and the strategies through which this form of knowledge has rewritten the world. In what follows, an exhaustive analysis of Example 6 is not undertaken. Rather, the ways in which the problem is solved using the semantic expansions made possible
through the meaning potentials of language, visual imagery and the symbolism, and the intersemiotic re-contextualizing relations which subsequently take place are discussed. The value of the SF–MDA approach for conceptualizing mathematical discourse and related issues of literacy are demonstrated.

The Statement of the Problem Context consists of two clauses where the problem is introduced. Significantly, the textual organization (i.e. spatial arrangement) and the passivized nature of ‘A particle moves along a straight line AB so that, after \( t \) seconds, its speed, \( v \) m/s, in the direction of AB is given by \( v=3t^2-15t+20 \)’ means that the symbolic equation \( v=3t^2-15t+20 \) is foregrounded as new and important information. From this point, the discourse shifts to the Table where ‘the corresponding values of \( t \) and \( v \)’ are organized as a series of relational processes between the values of \( t \) and \( v \). This shift involves a re-contextualization of experiential meaning, whereby the generalized symbolic equation \( v=3t^2-15t+20 \) is reconfigured as a series of identifying relational clauses between the corresponding values of \( t \) and \( v \) in the Table (i.e. \( t \leftrightarrow v \), \( 0 \leftrightarrow 20 \), \( 1 \leftrightarrow 8 \), \( 2 \leftrightarrow 2 \), \( 3 \leftrightarrow k \), \( 4 \leftrightarrow 8 \) and \( 5 \leftrightarrow h \)). The first command is to calculate the missing values \( k \) and \( h \). The second command is to draw the graph with the implicit assumption that the Table of values is to be used for this exercise. The third command is to use the graph to answer questions (a)–(d).

The first command, to calculate the values of \( k \) and \( h \), is completed, using \( v=3t^2-15t+20 \), algebraic laws and the rule of order of operations. The second command, to draw the graph, is undertaken using the Table of values and the calculated values of \( k \) and \( h \). The curve is suspended within the symbolic framework determined by the \( t \) and \( v \) axes. The transition from the Table to the Graph is very significant because it involves re-contextualizing the relational identifying relations between \( t \) and \( v \) as single entities in the form of points on the curve. This is a case of Semiotic Metaphor where symbolic relations (i.e. participants and processes \( v \leftrightarrow t \)) are reconstrued as single entities (i.e. points). The intersemiotic relations between the corresponding values and the visual display of those relations as points mean that the new entity of the curve is introduced. From here, the Graph provides a visual construal of the problem which is used to answer the Questions.

The Questions involve finding values at particular instances in the unfolding relations displayed in the Graph. Lines appear on the Graph to mark these values. The solutions involve the intersemiotic relations between the Graph, and the symbolic description of the curve and significant points on the curve. The solutions involve the grammar of language, mathematical symbolism and visual images, and significantly, the intersemiotic relations between the three forms of description. Furthermore, pre-established algebraic laws and definitions and the visual interpretation of those definitions are involved (e.g. questions (b)–(c) involve theoretical and geometrical interpretations of the gradient).
The above discussion reveals that Example 6 is solved by a series of inter-semiotic transitions involving the re-contextualization of ideational meaning. The linguistic introduction to the problem and the symbolic description of speed are re-contextualized as a series of corresponding values at different instances of time in the Table. From here, the relational processes between time ($t$) and speed ($v$) are re-contextualized as single points on the speed–time Graph. The resulting Graph is used a basis for logical reasoning about the speed–time relations at different instances of time. The re-contextualizing relations across the linguistic description, the symbolic relations in the Table, the visual Graph and the symbolic description of suspended instances mean that the problem is solved. The basis for the solution is pre-established definitions, laws and theorems which remain implicit. Mathematical literacy must necessarily take into account all these dimensions of meaning in mathematical discourse.

7 Conclusion

The preceding discussion underlines the claim that to be literate in mathematics, one needs to move beyond language to understand the functionality and grammars for mathematical symbolism and visual imagery, and the intersemiotic relations between the three semiotic resources through which semantic expansions take place. Such an approach requires a theory capable of incorporating these dimensions of mathematics discourse. It is proposed that this SF–MDA approach provides such a framework for exploring mathematical discourse and issues of literacy in mathematics education. The transdisciplinary approach incorporates perspectives from mathematics, linguistics, semiotics and education. The result is an approach which re-contextualizes literacy in mathematics; an approach which creates a new semantic realm to explore mathematics discourse, grammar and literacy.

Notes

1 Joseph (1991) and Swetz (1987), for example, describe the shifts which took place from rhetorical and syncopated algebra to symbolic algebra.

2 Functional labels (e.g. Problem, Solution, Question and Question Answer) are capitalized, following standard SFL practices (see Halliday 2004a and Martin 1992). In addition, the units and levels in the scalar hierarchical model (Baldry and Thibault 2006) proposed for multimodal mathematics texts are capitalized (e.g. Part, Figure and Episode; and Component, Item, Mini-Genre and Work/Genre) following O’Toole’s (1994) use of capitalization in The Language of Displayed Art (see O’Toole (1994: 10) for Member, Figure, Episode and Work).

3 Baldry and Thibault (2006: 31) refer to local groupings of elements in printed pages and web pages as clusters. However, the term does not effectively describe the very precise arrangement of groupings in mathematical texts, which are therefore called Items in this paper.
References


Lemke, J. L. (2003), ‘Mathematics in the middle: measure, picture,


5 Multiliteracies for Academic Purposes: Multimodality in Textbook and Computer-based Learning Materials in Science at University

Janet Jones

University of Sydney

1 Introduction

In today’s universities, traditional technologies in teaching and learning are increasingly being supplemented or replaced with newer information and communication technologies (ICTs). This poses challenges for literacy practices, while the blend of old and new pedagogical approaches has shifted boundaries which were previously clearly delineated. Learning science at university today is a very different experience from ten or fifteen years ago. In addition to ‘face-to-face’ activities such as attending lectures, tutorials and laboratory sessions, students spend a large proportion of their course time in an online learning environment. Here, they may receive all their course information, communicate via chat rooms with their lecturers and other students, search on the internet for relevant information for their assignments, compose and submit these online, and complete interactive computer modules and quizzes on their course content. Even their textbooks may be digitized or the print versions supplemented with interactive media.

The implications of the new learning technologies for redefining literacy and pedagogical practices have not yet been fully explored, as Kress (this volume) points out. The growing body of research on students learning with ICTs has yielded different perspectives on its benefits for learning. Research has tended to focus on the nature of the innovation, or on measuring student ‘learning gains’, rather than on what kinds of literacies students need in the new learning environments (e.g. Emerson and Mosteller 1998; Alexander 1999; Scott 2000; Laurillard 2002; Duhaney 2005; Riffell and Sibley 2005). The assumptions underlying much of the
research are that students already have the broader set of literacies they need in order to benefit from technology-enhanced learning environments.

The complexity of practices in which students are now engaged necessitates broadening the ‘singular’ concept of literacy to a pluralized set of literacies, or ‘multiliteracies’, encompassing visual, verbal and other literacies (Cope and Kalantzis 2000; Unsworth 2001). As Cope and Kalantzis (2000: 5) argue, in the new media environments, ‘meaning is made in ways that are increasingly multimodal’. This broader conceptualization of literacy is increasingly being framed within the research field of ‘multimodality’.

Thibault (2000: 312) characterizes multimodality as the diverse ways in which a number of distinct semiotic resources (linguistic, visual images, sound, movement) ‘are both co-deployed and co-contextualized in the making of a text-specific meaning’. It has also been described as a multiplicative rather than additive concept (e.g. Lemke 1998; Royce 1998; Thibault 2000), in which the combination of semiotic resources produces new patterns of relations which are not the same as the sum of each resource.

Over the past decade, social semiotic accounts of multimodality in a range of contexts have appeared. These accounts, largely based on systemic functional linguistics (SFL) (Halliday 1985; Martin 1992) include grammatical descriptions of images (O’Toole 1994; Kress and van Leeuwen 1996) see Kress, this volume, for differences between these two SFL-based approaches), of sound (van Leeuwen 1999), of action (Martinec 1998, 2000), and of three-dimensional space (O’Toole 2004; Stenglin 2004). The unifying theoretical principle underlying much of this research is Halliday’s metafunctions. This principle posits three metafunctions which simultaneously construe meaning: the ideational (representation and ordering of experience, oriented towards the field of discourse), the interpersonal (enacting social relationships, oriented towards the tenor of discourse) and the textual (organizing text, oriented towards the mode of discourse) (Halliday 1985).

In educational contexts in the science disciplines, recent investigation of multimodal representation on the page and screen has been carried out (Lemke 1998, 2000a, 2000b, 2002; Martin and Veel 1998; Miller 1998; Veel 1998; O’Halloran 1999a, 1999b, 2003, 2005, this volume; Baldry 2000; Thibault 2001; Guo 2004). However, apart from Baldry and Guo, much of this research has been confined to school-based contexts. In university settings, with the exception of Guo (2004), multimodal research has tended to focus on the ‘expert’ genres of the conference presentation (e.g. Rowley-Jolivet 2002), or the journal article (e.g. Lemke 1998; Miller 1998), rather than on multimodal genres in undergraduate science.

This chapter reports on research which aims to provide a social semiotic account of multimodality in print and electronic student learning materials in science at university. A particular objective of the research is
to explore the role of multimodality in the creation of technicality and abstraction in science.

There are two main motivating factors for this research, both of which are of an applied nature. One derives from my professional context in the Learning Centre (LC) at the University of Sydney. The role of the LC is to provide academic literacy support for all students regardless of language background, discipline or year of study. Increasingly, and in collaboration with staff in academic departments across the University, the LC has become engaged in curriculum design of online learning resources to support the development of students’ multiliteracies. Many of these projects have involved collaboration with departments in science and engineering. These include online report writing projects for undergraduate students in biology, biochemistry and chemical engineering. This work requires a deeper understanding not only of the multiliteracies undergraduate students need but also of how different disciplines construe meanings in the new learning environments. The other is to understand how SFL theory, which is the theoretical foundation for much of the teaching and research of the LC, can be extended to support a pedagogy for multiliteracies. At the core of such a pedagogy would be the development of a metalanguage for students and teachers to understand how meaning is construed in print and screen environments.

With this context in mind, the chapter will discuss selected results of the study. After describing the research design and the corpus, results of the visual content analysis will be presented. Next, the analyses of visual and verbal abstraction and technicality are discussed. The chapter concludes by considering the implications of the research for the teaching of multiliteracies for academic purposes.

2 The research design and the corpus

The research design consisted of two main stages, the first informing the selection of the texts analyzed in the second. The first stage involved a multimodal content analysis of a corpus of different types of computer-based and print-based learning materials in first-year science at university and the second stage involved SFL-based multimodal discourse analysis of a principled selection of these materials.

The corpus consisted of two chapters from textbooks used in physics and biology, interactive activities from two CD-ROMs accompanying textbooks in physics and biology, and activities from three websites designed for students in first-year physics, chemistry and biology. All texts covered the same general topic area in each discipline, e.g. fungi in biology, mechanical waves in physics. A total of 71 textbook pages and 192 screens were analyzed.
2.1 Multimodal content analysis

One of the criticisms of multimodal analysis within a social semiotic framework is that it is overly interpretive and not supported by empirical evidence (Bateman et al. 2002: 2–3). In selecting content analysis as the methodology, I was concerned to adopt a quantitative approach which complemented the subsequent qualitative multimodal discourse analysis. While clearly offering a different perspective on the corpus, quantitative approaches yield solid empirical data upon which to base further detailed analysis, and, in this study, provided a principled basis for selecting the texts for the SF semiotic analysis. Adopting a dual approach to analysis thus provides a multifaceted perspective on the texts, which can show both generality and complexity.

Content analysis is a very general approach to text analysis and recently, with computer-assisted techniques of analysis, the range of data has widened to include written and multimedia material such as books, advertisements, films, song lyrics, photographs, etc. (Bauer 2000). Bell (2001: 13) has defined content analysis as ‘an empirical (observational) and objective procedure for quantifying recorded “audio-visual” (including verbal) representation using reliable, explicitly defined categories (“values” on independent “variables”).’ Bell’s study of the front covers of an Australian magazine provides a useful insight into how content analysis can be linked to a semiotic model of the visual (Bell 2001: 27–31).

2.2 Categorization of content

One of the limitations of content analysis often cited is the ‘un-theorized’ content (Neuman 2000: 294; Bell 2001: 24). In Stage 1, I decided therefore, to draw on SF semiotic theory to inform the categorization of the content. Accordingly, as an integrating principle, the metafunctional orientation to meaning formed the theoretical basis for the categorization of the content.

The multimodal content was first divided into visual content, text blocks, animations, interactivity and sound. Visual content, text blocks and types of interactivity were also grouped according to which metafunctional meaning appeared to be foregrounded. Coding systems were then devised for categories of:

1) visuals and use of colour or black/white
2) technology used to create the visual content
3) location of visual on page/screen
4) proportion of text blocks to visual blocks on page/screen
5) text blocks and use of colour or black/white
6) font/font size
7) animation *
8) interactivity and its functions *
9) presence or absence of sound *
10) functions of sound.*

(* = only in screen texts)
The next section presents some key findings for the multimodal content analysis, focusing on analyses of visual content, and considering how this content varies according to page or screen format and to discipline.

3 Results of visual content analysis

The categorization of visuals was informed by typologies of visuals in scientific text within social semiotics (e.g. Lemke 1998; Thibault 2001) and other areas of inquiry such as the sociology of scientific knowledge (e.g. Lynch 1990; Myers 1992), and graphic design (Twyman 1979). I decided to distinguish the categories of photograph, photographic collage and micrograph, as not only was each of these three categories seen to perform a different function, different technology was used to create the images. Photographs were mostly used to depict the topic or field while photographic collage was a computer-enhanced assemblage of different parts of a photo or of different photos designed to add decorative interest to the page or screen. Micrographs are typical of the discipline of biology, and, while on one level they can be considered photographs, in that a camera may capture the image, the camera is affixed to a microscope and the image is taken through a microscope or similar device to show a magnified image. This produces a highly technical image and, unlike the photograph, tends to be recognizable only by a person with disciplinary knowledge. Equations were also included in visual content as, following O’Halloran (1999a, 1999b, 2005, this volume) and Lemke (1998), they employ mathematical symbolism as a semiotic resource distinct from verbal language. Also, they were often set off typographically from the verbal text or numbered, and as such were regarded as visual rather than textual blocks. The category of icon and its hypertextual counterpart on the screen texts were also considered part of the visual display, as they contributed to visual rather than to verbal content. Graphs were distinguished from scientific drawings and equations, since they serve a different

<table>
<thead>
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<th>oriented meanings</th>
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<tbody>
<tr>
<td>Photograph</td>
<td>* Photo collage</td>
</tr>
<tr>
<td>Micrograph</td>
<td>* Cartoon</td>
</tr>
<tr>
<td>Drawing</td>
<td>Logo, button or icon</td>
</tr>
<tr>
<td>Table</td>
<td>* Logo, button or icon as hyperlink</td>
</tr>
<tr>
<td>Equation</td>
<td></td>
</tr>
<tr>
<td>Graph</td>
<td></td>
</tr>
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</table>
function, although they often incorporated elements of each of these categories.

Ten categories of visuals were found, which were grouped according to their main purpose in the text and their orientation in the metafunctional organization of meanings. Within SFL, all meaning systems select simultaneously from the metafunctions, but at this point in the analysis, the visual categories were classified according to which metafunctional meanings appeared to be foregrounded, as shown in Table 5.1.

Categories in the left-hand column all contributed to the experiential content, creating the field-specific meanings and technicality. Categories in the middle column occurred only in the screen texts and were peripheral to the disciplinary content, adding ‘interest’ for the user in the form of cartoons or photo collage. Categories in the right-hand column focused on the organization of the text as a whole, e.g. through forward or back buttons or as ‘anchoring’ logos (e.g. University of Sydney, WebCT, publishers’ logos), pointing the reader/user to other information or to activities not visible on the active page or screen.

To determine the distribution of the metafunctional groupings of visuals across the texts, the total contribution of each group of visuals was calculated. The results are shown in Figure 5.1.

Different groups of visuals predominate in the textbooks and screen texts. In the textbooks, experientially-oriented categories far outweighed the other two groups, while in the screen texts, categories foregrounding

![Figure 5.1 Comparison of experiential, interpersonal and textual categories of visuals across texts](image-url)
the textual metafunction were dominant. The screen texts focused more on navigational types of visuals to orient the user to the organization of the content and the pedagogical activities, while the textbooks were more concerned with topic-oriented visuals, i.e. those foregrounding the experiential metafunction.

The range of visual categories for each text and the proportions of each category per text showed variation according to both discipline and text. The physics CD-ROM and the biology website showed the greatest range of visual categories with seven of the full range of ten visual types represented. This does not mean, however, that these two screen texts were more ‘visually’ oriented than the others, since in these two texts the visual content was doing more navigational work than experiential. When all the non-topic oriented categories, that is, those which contribute to navigation – logos, buttons and icons, and those which are interpersonally-oriented – photo collage and cartoon – are removed from the range, leaving the experientially-oriented categories, the disciplinary variation becomes more marked. Some categories only occurred in physics and chemistry, i.e. equations and graphs, while others, i.e. micrographs, only in biology. There was also a high proportion of photographs in the biology texts. Overall, the textbooks had a far higher proportion of experientially-oriented visuals than the screen texts. Perhaps this is not surprising as the volume of text and image in the textbooks enabled a greater coverage of the topic.

4 Visual density and proportion of visual blocks to text blocks

4.1 Analyses of visuality

Two analyses of visuality of the corpus were carried out, visual density and the proportion of visual blocks to text blocks. The measure for visual density (VD) was calculated as the total number of visuals counted for each text divided by the number of pages/screens analysed. For example, the biology textbook chapter has a total of 27 pages and 51 visuals, giving a

<table>
<thead>
<tr>
<th></th>
<th>VD</th>
<th>VD1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Txt Bio</td>
<td>1.89</td>
<td>1.89</td>
</tr>
<tr>
<td>Txt Phys</td>
<td>3.48</td>
<td>3.39</td>
</tr>
<tr>
<td>CD Bio</td>
<td>2.62</td>
<td>0.62</td>
</tr>
<tr>
<td>CD Phys</td>
<td>4.26</td>
<td>0.96</td>
</tr>
<tr>
<td>Web Bio</td>
<td>3.62</td>
<td>0.6</td>
</tr>
<tr>
<td>Web Phys</td>
<td>1.72</td>
<td>0.1</td>
</tr>
<tr>
<td>Web Chem</td>
<td>10.15</td>
<td>1.42</td>
</tr>
</tbody>
</table>
visual density of 1.89. Because of the high proportion of navigation visuals in the screen texts, a second measure of visual density (VD1) was calculated to give a more accurate representation of the visual density of the disciplinary content of the texts. VD1 refers to the total number of visuals without the icon/button/logo categories, the navigational cartoons and the photo collage images. Table 5.2 compares the VD across the texts in terms of two values, VD and VD1.

The highest VD was for the chemistry website while the lowest was for the physics website. This pattern changes for VD1, where both textbooks showed a higher visual density than the screen texts. This finding accords with Unsworth (1999), who also found visual sparsity of content-oriented visuals in screen texts. The bulk of the work being done by the visuals is for navigation rather than for depicting disciplinary content.

4.2 Proportion of visuals to text

Another measure of visuality which complements that of visual density is a measure of the proportion of visual blocks to text blocks. Three categories were devised to determine roughly how much space was devoted to visuals per page or screen. (A = more than 1/2 page/screen, B = 1/2 page/screen; and C = less than 1/2 page/screen). There was considerable variation across the texts. Within the textbooks, the visuals in the biology textbook occupied the largest amount of space, since half of the pages were in Category A, while in the physics textbook, less than 20 per cent of the pages fell into this category. In the screen texts, only the biology CD-ROM showed a greater proportion of space occupied by visuals than text blocks, with 70 per cent of screens in Categories A and B. The next highest proportion in the same categories was the chemistry website (about 60 per cent). The biology and physics websites and the physics CD-ROM showed that more space was assigned to text blocks than to visuals. In both textbooks the salience of many drawings, through their size, was also of interest, many of them occupying a full half page.

4.3 Location of visuals on page and screen

It was decided to track location of visuals to determine whether there was any consistency in location and ultimately, how layout contributed to meaning. Decisions about the location of visuals was also informed by the principles of graphic design and web design, such as the use of the vertical and horizontal axes and the underlying modular grid (Nielsen 2000; Gillieson 2003). Following Halliday (1985: 274–8) on information structure, Kress and van Leeuwen (1996) posit that meanings are realized by the placement of visual elements in various ‘zones’ on the page (or screen) e.g. right–left; centre–margin; top–bottom. For example, elements placed on the left are described as Given or ‘commonsensical, self-evident’, while elements on the right are described as New or ‘something
which is not yet known . . . problematic, contestable . . .' (Kress and van Leeuwen 1996: 187; however, this concept has also been challenged by other multimodal researchers such as Bateman et al. 2002). Both the textbook and screen text visuals occupied a large number of locations on the page and screen, ranging from 18 in the physics textbook to six on the biology CD-ROM. The high number of locations in the physics textbook was due to the high proportion of equations, which need to occupy a wide variety of positions on the page, since they are integrated more closely than other visual types into the running text. Visuals such as photographs, micrographs or drawings have fewer possible positions due to page/screen size and design constraints. Moreover, the space that these three categories occupy tends to be larger than that for equations, particularly in the case of textbook visuals.

The location of visuals appears to be more related to the underlying design grid of the page or screen than to information value. For example, the underlying grid of the biology textbook page is two vertical columns divided into a possible maximum of eight blocks, which can each be occupied by text or image. These eight blocks are more or less arranged on the horizontal axis as four pairs of adjacent blocks. In their discussion of left-hand (Given) and right-hand (New) relations in magazine layouts, Kress and van Leeuwen (1996: 189) claim that the Given space is often occupied by the verbal text while the New is occupied by images. In the textbooks, there was no such pattern. In both textbooks, verbal text occupied left and right position equally on the page, although the proportions of text varied. In the biology textbook, where the page is divided into two equal columns, images occurred more on the left than on the right but in the physics textbook, the reverse was true. The constraints of space may also play a role in the layout and design of large complex university textbooks such as these.

To sum up, in terms of experiential content, the visual density is higher in the textbooks and a higher proportion of visuals contribute to this content than in the screen texts. Moreover, many of the visuals in the textbooks are highly salient, and display a complexity and intricacy which has been achieved by employing advanced technologies in their production. The high proportion of textually-oriented visuals in the screen texts means that the visual mode is used more for navigation than for teaching subject content. Visuals are generally allocated less space than text blocks on the screen and there is less variation in the range of visuals than in the range of text blocks. There is clear disciplinary variation in the types of visual consistent across page and screen texts. Finally, the location of visuals is more variable on the page than on the screen and is influenced strongly by the design grid. It has been claimed that the textbook is being influenced by the logic of the screen (Kress 2003: 7–8) and that compared with 40 years ago the functional load of textbooks is now carried by the image. The results of the visual content analysis present evidence which challenges this claim.
While the focus in the preceding discussion has been mainly on visual content, the multimodal content analysis of this study yielded some solid empirical data on the distribution of text, image, sound and interactivity according to format and discipline. On the basis of these data it was observed how discipline and format can determine such content. Although it is important to acknowledge the limitations of content analysis, it provided a set of principles on which to make an informed selection of texts for the SF semiotic analysis, the focus of the second part of this chapter.

5 Visual and verbal technicality and abstraction

In the language of science there is a complex interrelationship between the lexical and grammatical resources of elaboration and distillation, superordination and composition used to set up technicality and abstraction. Technical terminology is identified, defined, ordered and explained so that generalizations can be made about classes of participants. Grammatical metaphor plays a vital role in this technicalizing process (Halliday 1998). However, in constructing the technicality of a discipline, language is not the only meaning system involved. The concept of technicality also includes an understanding of how multimodal meaning resources, such as image, typography and animation contribute to technical meaning. A microscopic image of a spore which can be seen in a textbook or animated on the screen is read or viewed in conjunction with a definition or explanation in the verbal text. A technical term may be highlighted in a text through typographical resources such as colour, bold face or italics. On screen, the technical term may be hyperlinked to a glossary which defines and explains the term or to a databank of images. An image may also be represented in increasingly more abstract ways, when we compare a photograph with an abstract drawing or a graph, for example. Different types of images may range along a scale of abstraction, from the most naturalistic representation to the least. In this process, other variables come into play, which relate to the degree of abstraction of a certain image. The image may depict a certain representation of events and participants or represent these as generic. It may show surface characteristics or the underlying structure of an object. From the field of visual rhetoric, the work of Beck and Osman-Jouchoux (1992) and Mishra (1999), for example, provide useful insights into the concept of abstraction in scientific and technical images.

5.1 Verbal technicality and abstraction

In order to establish the extent to which the verbal text displayed co-variation in the grammatical resources typical of complexity in scientific discourse, measures for lexical density, technicality and grammatical metaphor were calculated for a total of 887 clauses in six texts – two
textbooks, two CD-ROMs and two websites – as a prelude to the analysis of visual technicality and visual abstraction. I was also interested to determine if any variation in the measures was related to discipline or format. The grammatical resources which contribute to technicality, which have to do with the semantics of elaboration and taxonomic relations among participants (Martin 1986: 20–2) were therefore tracked across the texts. Based on these resources, a table of categories of technicality was set up and a measure obtained for each text by dividing the number of instances by the number of ranking clauses. The measure included grammatical resources and field-specific technical terms and was based on the analytical categories in Jones (1991). Grammatical metaphor analysis was carried out in a similar way, with a table of categories of metaphor set up to track the number of instances through the texts. The table of categories extends those proposed by Jones (1991) and Ravelli (1985). The following extract from the corpus illustrates the grammatical metaphor analysis, in which the instances are marked in bold:

Cl CHEMISTRY WEBSITE: CHEMICAL EQUILIBRIUM MODULE

Some chemical **reactions** continue until one reagent is effectively completely consumed.
The **reaction** has reached a condition where the **reaction** of **reactants** forming **products** (left to right) is occurring at exactly the same rate as the breakdown of **products** to re-form the **reactants**.

Although **concentrations** can be used, in describing gaseous **reactions** it is quite common that the equilibrium law is written in terms of the partial **pressures** of the substances taking part in the **reaction**.

Nominalizations of material Processes and Things metaphorically realized as Epithets or Classifiers were the two most frequently occurring sub-categories in all the texts. In the chemistry website module on chemical equilibrium, for example, nominalizations of material processes accounted for over half the measure of grammatical metaphor. It was used to build up the technicality about the behaviour of chemical reactions as they approach equilibrium. Technical terms **reaction**, **reactant**, **product**, **concentration**, **pressure** are all instances of nominalized material processes. In the same text about one quarter of the instances were Things realized as Epithets or Classifiers, which also contributed to technical taxonomies through Classifier^Thing structures such as **reactant concentrations**.

Finally, lexical density as a measure of the average number of content words per clause was calculated. The three measures tended to occur as co-varying patterns in all texts. High lexical density was associated with high measures of technicality and grammatical metaphor – for example in the biology textbook – and low lexical density with low measures of grammatical metaphor and technicality – for example in the physics CD-ROM. Both the biology and physics textbooks displayed similar measures of lexical density and grammatical metaphor, although technicality was
higher for all biology texts. This suggests that variation appears to be associated with format rather than discipline, a point which was reinforced by the content analysis discussed above. The verbal text in textbooks serves the important pedagogical function of building discipline-specific knowledge which is both technical and abstract.

5.2 Visual technicality

If a reconstrual of experience occurs through the grammatics of technicality and abstraction in scientific discourse what kinds of reconstruals are taking place in the images which accompany the text and, if scientific verbiage and image co-occur, do they also co-vary? In order to track the relationship between verbal and visual technicality, the proportion of visuals contributing to technicality and field-specific meaning (i.e. photos, micrographs, drawings, tables, equations and graphs) was represented with the measure of technicality for the verbal text. Figure 5.2 shows the results of these two measures.

In the textbooks there was a strong relationship between verbal and visual technicality, in that the high proportion of visuals contributing to technicality corresponded to high measures of technicality. The relationship is less clear in the screen texts. This can be partly explained by the fact that in the screen texts, the visuals are doing more navigation work than field-oriented work, as was discussed earlier in the content analysis. The relatively high measure of verbal technicality for the biology CD-ROM can be explained by the use of a glossary of technical terms with hyperlinks to the term and its definition or explanation. This glossary is not, however,

![Figure 5.2 Verbal and visual technicality](image-url)
elaborated in the visual mode. In the textbooks, the visuals played a much more significant role in constructing field than in the screen texts. The CD-ROMs and websites have similar proportions of technical visuals, although those of the websites are slightly lower.

5.3 Visual abstraction

Next, the relationship between visual and verbal abstraction was investigated by comparing the measure of grammatical metaphor with a measure obtained for visual abstraction. Following Kress and van Leeuwen (1996: 159) and Unsworth (2001: 89–90), abstract images were taken to be those which involved a shift from concrete reality, removing them from familiar representations of events, participants and places in the concrete world. Aspects of form, function, setting and other detail are removed to render the whole image, or parts of the image, abstract. Although visual abstraction is not completely analogous to verbal abstraction or grammatical metaphor, there are some points of contact. One is the shift from concrete to abstract, which occurs in both systems of semiosis, resulting in a reconstrual of experiential meaning in the perceived world. Another is the shift from specific to generic which takes place through grammatical metaphor in language and through the depiction of elements of the image as generic or typical rather than specific. The relationship between abstraction in text and in image in pedagogic texts is seldom made explicit to students at university and would be a very productive area to explore in developing a pedagogy of multiliteracies.

Four categories of visuals were considered to be abstract: drawings, tables, equations and graphs. A measure of abstract visuals for each text

![Figure 5.3 Grammatical metaphor and abstract visuals](image-url)

Figure 5.3 Grammatical metaphor and abstract visuals
was obtained by calculating the proportion of these categories of the total number of visuals for the text.

There was some co-variation in the measures for abstract visuals and grammatical metaphor, as shown in Figure 5.3. In part, similar patterns of co-variation to those found in visual and verbal technicality occurred. The highest proportion of abstract visuals corresponded to the highest measure of grammatical metaphor, or verbal abstraction, in the physics textbook. However, a low measure of abstract visuals corresponded to a high measure of grammatical metaphor in the biology textbook and CD-ROM. The websites had a lower proportion of abstract visuals than the CD-ROMs and the textbooks, but a medium-high grammatical metaphor measure. This can be explained by disciplinary differences in the choice of abstract visual. In the biology textbook, photographs and micrographs, which are seen at this stage to contribute to technicality rather than to visual abstraction, were predominant, while drawings occurred less frequently and graphs and equations not at all. The reverse was true in the physics textbook, where drawings, equations and graphs formed 92 per cent of the total number of visuals.

5.4 The four measures

When all four measures are plotted together, interesting patterns emerge. Apart from the biology textbook, the values for visual abstraction and technicality were similar. Low or high measures of visual abstraction corresponded to low or high measures of visual technicality. In the screen texts

![Figure 5.4 Visual and verbal technicality and abstraction showing co-variation](image-url)
the four measures form a somewhat different pattern. On the websites, low visual measures corresponded to medium verbal measures, while on the biology CD-ROM, low visual measures corresponded to high verbal measures, and on the physics CD-ROM, medium visual measures to low verbal measures. The only high visual measures were found in the textbooks, with the physics textbook showing strong correspondence in all four measures. The relationships can be seen in Figure 5.4.

Seen together, the measures reveal a relatively strong trend of co-variation, although the patterns differ depending on format and discipline. This may be expected in such pedagogic genres in science, where visual and verbal semiosis have to work closely together to create highly explicit technical and abstract meanings for the student. In expert genres such as research articles, the interrelationships may not need to be as explicit, since the expert reader will have a high level of insider knowledge.

6 Conclusion and pedagogical implications

In pedagogic texts, highly technical and abstract images are mediated by labels, captions and the main text. To an expert eye it may be possible to read such images without verbal explanation or elaboration, but for the student, the verbal text plays a vital role in translating the meaning of the image. Moreover, the principles of selection of images for pedagogic purposes may be quite different from those for expert genres such as research articles, since images, like text, are social constructs and serve different functions in different genres. In textbooks for science, images are not there to ‘prove’ a point in a particular piece of research but rather to present generalized ‘evidence’ for accepted knowledge, as Myers (1992) has noted. What then are the implications for pedagogy, curriculum and research of the new literacy demands for today’s university students? As alluded to in the introduction, the pedagogy in the complex new learning environments does not acknowledge the challenges for students of the ‘new dimensions of multiliteracies afforded by information technology’ and the need for ‘meta-semiotic knowledge’ (Unsworth 2001: 12). Such complex learning environments certainly warrant a pedagogy which considers multiliteracies and the differentiation of discipline-specific literacies. A crucial component of a new pedagogy for multiliteracies is that of a metalanguage for ‘an open-ended and flexible functional grammar’ (Cope and Kalantzis 2000: 6) that describes multimodal meaning resources in their contexts of use. In university contexts, the metalanguage of SFL has been effectively used in the development of academic literacies and in transdisciplinary approaches to teaching and research. Jones (2004) provides an overview of some of the key references in this area. Further analysis of multimodality and intersemiosis will help to extend the metalanguage, thereby opening up possibilities for incorporating into pedagogy a description of how different forms of semiosis work together to expand...
meaning potential in any discipline. This entails collaborative approaches to developing students’ multiliteracies, which combine different areas of teaching expertise in multimodal semiotics and in disciplines such as the sciences.

The new learning technologies are here to stay in our universities. The challenge for the future will be to move beyond research which sets out to establish the superiority of such technologies over traditional technologies. It is hoped that insights from research such as that presented here can be used to inform educational design of screen and print-based pedagogical genres in science and lead to a more critical perspective on a pedagogy of multiliteracies in the wider university community.

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with high modality values across linguistic, visual and symbolic selections, thus providing a stable context for mathematical ideational meaning.

In summary, mathematical discourse involves:

- **Intrasemiosis** for accessing the meaning potential of language, visual imagery and mathematical symbolism.
- **Intersemiosis** in the form of co-contextualizing and re-contextualizing relations. Intersemiosis creates new semantic layers where the meaning of the re-contextualized ideational relations extend beyond that possible with language. The semantic realm is concerned with the descriptions of relations for the purposes of prediction and establishing causality (O’Halloran 2007). Co-contextualizing textual and interpersonal relations enable the new ideational content to be foregrounded.

5 Intersemiotic metafunctionally-based systems

The exploration of intersemiotic mechanisms suggests that metafunctionally-based systems for intersemiosis exist (see Royce 1998; O’Halloran 2005). Most certainly, Martin’s (1992; Martin and Rose 2003) discourse systems have the potential to function intersemiotically in multimodal texts (Martin 2002). Furthermore, the preceding discussion suggests that metafunctionally-based systems for intersemiosis exist at the rank of grammar and on the display stratum. Tentative preliminary frameworks for ideational intersemiotic systems, which require further research and development, are presented in Tables 4.5(a)–(b). The SF–MDA discourse systems are based on Martin’s (1992; Martin and Rose 2003) discourse systems of IDEATION and CONJUNCTION & CONTINUITY. The frameworks are illustrated by examples from Figure 4.1. SF–MDA intersemiotic systems for interpersonal and textual meaning (O’Halloran 2005) are not included because of space constraints.

The SF–MDA discourse system for experiential meaning in Table 4.5(a) is INTERSEMIOTIC IDEATION. For example, the Activity Sequence in Figure 4.1 (e.g. ‘Use your graph’ and ‘from your graph’) stretches across Mini-Genres, Items and Components. At the rank of grammar, TRANSITIVITY RELATIONS involve relational processes which assign values across different semiotic resources (e.g. after t seconds, its speed, \(v\) m/s, in the direction AB is given by \(v=3t^2-15t+20\)). This may involve LEXICALIZATION, SYMBOLIZATION and/or VISUALIZATION of the functional element in question (e.g. speed and \(v\) m/s). Intersemiosis is aided by LABELS which are often multisemiotic (e.g. ‘acceleration=0’ with arrow in the Graph). On the display stratum, JUXTAPOSITION and the use of space create intersemiotic relations (e.g. relational identifying processes in the Table). In addition, FONT style (e.g. italics for variable \(t\)) and COLOUR (e.g. red points in the Graph to represent the relations in the Table) are systems which aid the intersemiotic expansion of meaning.

The SF–MDA discourse system for logical meaning in Table 4.5(b) is the INTERSEMIOTIC IMPLICATION SEQUENCE, which stretches across
Mini-Genres, Items and Components through the use of linguistic and symbolic conjunctions, conjunctive adjuncts and cohesive ties (e.g. ‘when’ and ‘.’ to calculate $k$ and $h$ in the Question Answers). At the rank of grammar, LOGICO-SEMANTICS & INTERDEPENDENCY establish intersemiotic logical relations (e.g. use of arrow in the Graph). The INTERPLAY OF SPATIALITY & TEMPORALITY through visual, textual and symbolic transformations realizes logical meaning (e.g. relational processes in the Table are reconstrued as points on the Graph and the resulting curve is used in Question Answers). On the display stratum, SPATIAL POSITION is used to create a sequence of Items (e.g. Questions and Question Answers) and COLOUR aids logical reasoning (e.g. brown borders in the Table are linked to the brown curve in the Graph in the original text).

### Table 4.5(a) SF–MDA Systems: The Experiential Metafunction

<table>
<thead>
<tr>
<th>Meta-function Discourse</th>
<th>Grammar</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERSEMIOTIC IDEATION</td>
<td>TRANSITIVITY RELATIONS</td>
<td>JUXTAPOSITION</td>
</tr>
<tr>
<td>Activity sequences and relations which span semiotic resources</td>
<td>Relational processes to set up identifying relations across semiotic resources</td>
<td>Use of space and position to create lexical, symbolic and visual relations</td>
</tr>
<tr>
<td>LEXICALIZATION, SYMBOLIZATION &amp; VISUALIZATION</td>
<td>FONT</td>
<td>Use of font style, size and colour for experiential meaning</td>
</tr>
<tr>
<td>Functional elements are represented using semiotic resources</td>
<td>SEMIOTIC METAPHOR</td>
<td>COLOUR</td>
</tr>
<tr>
<td>Shifts in functional status of elements and introduction of new elements</td>
<td>USE OF LABELS</td>
<td>Use of Labels which use multiple semiotic resources</td>
</tr>
</tbody>
</table>

**INTERSEMIOSIS ACROSS LANGUAGE, MATHEMATICAL SYMBOLISM AND VISUAL DISPLAY**
The formulations of SF–MDA systems for ideational meaning in Tables 4.5(a)–(b) are illustrative only. Further research is necessary to investigate the systems through which an expansion of meaning occurs through intersemiosis in multimodal texts (Kress and van Leeuwen 1996; Baldry and Thibault 2006). For example, Royce (1998) proposes systems for intersemiotic complementarity between linguistic and visual texts, and Martinec (2005) formulates systems for logico-semantic relations and status for text-image relations in old and new media. Such research is fundamental to developing SF–MDA aimed at theorizing and analysing multimodal texts.

### Table 4.5(b) SF–MDA Systems: The Logical Metafunction

<table>
<thead>
<tr>
<th>Meta-function Discourse</th>
<th>Grammar</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical</td>
<td>INTERSEMIOTIC IMPLICATION SEQUENCES Cohesive and structural devices</td>
<td>LOGICO-SEMANTICS &amp; INTERDEPENDENCY Cohesive and conjunctive devices</td>
</tr>
<tr>
<td></td>
<td>SEMIOTIC METAPHOR Shifts in functional status of logical relations across semiotic resources</td>
<td></td>
</tr>
</tbody>
</table>

The formulations of SF–MDA systems for ideational meaning in Tables 4.5(a)–(b) are illustrative only. Further research is necessary to investigate the systems through which an expansion of meaning occurs through intersemiosis in multimodal texts (Kress and van Leeuwen 1996; Baldry and Thibault 2006). For example, Royce (1998) proposes systems for intersemiotic complementarity between linguistic and visual texts, and Martinec (2005) formulates systems for logico-semantic relations and status for text-image relations in old and new media. Such research is fundamental to developing SF–MDA aimed at theorizing and analysing multimodal texts.

### 6 SF–MDA analysis of Example 6 (Figure 4.1)

The formulation of intersemiotic mechanisms and systems sheds light on the functionality of mathematical discourse, and the strategies through which this form of knowledge has rewritten the world. In what follows, an exhaustive analysis of Example 6 is not undertaken. Rather, the ways in which the problem is solved using the semantic expansions made possible
through the meaning potentials of language, visual imagery and the symbolism, and the intersemiotic re-contextualizing relations which subsequently take place are discussed. The value of the SF–MDA approach for conceptualizing mathematical discourse and related issues of literacy are demonstrated. 

The Statement of the Problem Context consists of two clauses where the problem is introduced. Significantly, the textual organization (i.e. spatial arrangement) and the passivized nature of ‘A particle moves along a straight line AB so that, after \( t \) seconds, its speed, \( v \text{ m/s} \), in the direction of AB is given by \( v=3t^2-15t+20 \)’ means that the symbolic equation \( v=3t^2-15t+20 \) is foregrounded as new and important information. From this point, the discourse shifts to the Table where ‘the corresponding values of \( t \) and \( v \)’ are organized as a series of relational processes between the values of \( t \) and \( v \). This shift involves a re-contextualization of experiential meaning, whereby the generalized symbolic equation \( v=3t^2-15t+20 \) is reconfigured as a series of identifying relational clauses between the corresponding values of \( t \) and \( v \) in the Table (i.e. \( t \leftrightarrow v, 0 \leftrightarrow 20, 1 \leftrightarrow 8, 2 \leftrightarrow 2, 3 \leftrightarrow k, 4 \leftrightarrow 8 \) and \( 5 \leftrightarrow h \)). The first command is to calculate the missing values \( k \) and \( h \). The second command is to draw the graph with the implicit assumption that the Table of values is to be used for this exercise. The third command is to use the graph to answer questions (a)–(d).

The first command, to calculate the values of \( k \) and \( h \), is completed, using \( v=3t^2-15t+20 \), algebraic laws and the rule of order of operations. The second command, to draw the graph, is undertaken using the Table of values and the calculated values of \( k \) and \( h \). The curve is suspended within the symbolic framework determined by the \( t(s) \) and \( v(m/s) \) axes. The transition from the Table to the Graph is very significant because it involves re-contextualizing the relational identifying relations between \( t \) and \( v \) as single entities in the form of points on the curve. This is a case of Semiotic Metaphor where symbolic relations (i.e. participants and processes \( v \leftrightarrow t \)) are reconstrued as single entities (i.e. points). The intersemiotic relations between the corresponding values and the visual display of those relations as points mean that the new entity of the curve is introduced. From here, the Graph provides a visual construal of the problem which is used to answer the Questions.

The Questions involve finding values at particular instances in the unfolding relations displayed in the Graph. Lines appear on the Graph to mark these values. The solutions involve the intersemiotic relations between the Graph, and the symbolic description of the curve and significant points on the curve. The solutions involve the grammar of language, mathematical symbolism and visual images, and significantly, the intersemiotic relations between the three forms of description. Furthermore, pre-established algebraic laws and definitions and the visual interpretation of those definitions are involved (e.g. questions (b)–(c) involve theoretical and geometrical interpretations of the gradient).
The above discussion reveals that Example 6 is solved by a series of inter-semiotic transitions involving the re-contextualization of ideational meaning. The linguistic introduction to the problem and the symbolic description of speed are re-contextualized as a series of corresponding values at different instances of time in the Table. From here, the relational processes between time \((t)\) and speed \((v)\) are re-contextualized as single points on the speed–time Graph. The resulting Graph is used a basis for logical reasoning about the speed–time relations at different instances of time. The re-contextualizing relations across the linguistic description, the symbolic relations in the Table, the visual Graph and the symbolic description of suspended instances mean that the problem is solved. The basis for the solution is pre-established definitions, laws and theorems which remain implicit. Mathematical literacy must necessarily take into account all these dimensions of meaning in mathematical discourse.

7 Conclusion

The preceding discussion underlines the claim that to be literate in mathematics, one needs to move beyond language to understand the functionality and grammars for mathematical symbolism and visual imagery, and the intersemiotic relations between the three semiotic resources through which semantic expansions take place. Such an approach requires a theory capable of incorporating these dimensions of mathematics discourse. It is proposed that this SF–MDA approach provides such a framework for exploring mathematical discourse and issues of literacy in mathematics education. The transdisciplinary approach incorporates perspectives from mathematics, linguistics, semiotics and education. The result is an approach which re-contextualizes literacy in mathematics; an approach which creates a new semantic realm to explore mathematics discourse, grammar and literacy.

Notes

1 Joseph (1991) and Swetz (1987), for example, describe the shifts which took place from rhetorical and syncopated algebra to symbolic algebra.

2 Functional labels (e.g. Problem, Solution, Question and Question Answer) are capitalized, following standard SFL practices (see Halliday 2004a and Martin 1992). In addition, the units and levels in the scalar hierarchical model (Baldry and Thibault 2006) proposed for multimodal mathematics texts are capitalized (e.g. Part, Figure and Episode; and Component, Item, Mini-Genre and Work/Genre) following O’Toole’s (1994) use of capitalization in The Language of Displayed Art (see O’Toole (1994: 10) for Member, Figure, Episode and Work).

3 Baldry and Thibault (2006: 31) refer to local groupings of elements in printed pages and web pages as clusters. However, the term does not effectively describe the very precise arrangement of groupings in mathematical texts, which are therefore called Items in this paper.
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1 Introduction

In today’s universities, traditional technologies in teaching and learning are increasingly being supplemented or replaced with newer information and communication technologies (ICTs). This poses challenges for literacy practices, while the blend of old and new pedagogical approaches has shifted boundaries which were previously clearly delineated. Learning science at university today is a very different experience from ten or fifteen years ago. In addition to ‘face-to-face’ activities such as attending lectures, tutorials and laboratory sessions, students spend a large proportion of their course time in an online learning environment. Here, they may receive all their course information, communicate via chat rooms with their lecturers and other students, search on the internet for relevant information for their assignments, compose and submit these online, and complete interactive computer modules and quizzes on their course content. Even their textbooks may be digitized or the print versions supplemented with interactive media.

The implications of the new learning technologies for redefining literacy and pedagogical practices have not yet been fully explored, as Kress (this volume) points out. The growing body of research on students learning with ICTs has yielded different perspectives on its benefits for learning. Research has tended to focus on the nature of the innovation, or on measuring student ‘learning gains’, rather than on what kinds of literacies students need in the new learning environments (e.g. Emerson and Mosteller 1998; Alexander 1999; Scott 2000; Laurillard 2002; Duhaney 2005; Riffell and Sibley 2005). The assumptions underlying much of the
research are that students already have the broader set of literacies they need in order to benefit from technology-enhanced learning environments.

The complexity of practices in which students are now engaged necessitates broadening the ‘singular’ concept of literacy to a pluralized set of literacies, or ‘multiliteracies’, encompassing visual, verbal and other literacies (Cope and Kalantzis 2000; Unsworth 2001). As Cope and Kalantzis (2000: 5) argue, in the new media environments, ‘meaning is made in ways that are increasingly multimodal’. This broader conceptualization of literacy is increasingly being framed within the research field of ‘multimodality’.

Thibault (2000: 312) characterizes multimodality as the diverse ways in which a number of distinct semiotic resources (linguistic, visual images, sound, movement) ‘are both co-deployed and co-contextualized in the making of a text-specific meaning’. It has also been described as a multiplicative rather than additive concept (e.g. Lemke 1998; Royce 1998; Thibault 2000), in which the combination of semiotic resources produces new patterns of relations which are not the same as the sum of each resource.

Over the past decade, social semiotic accounts of multimodality in a range of contexts have appeared. These accounts, largely based on systemic functional linguistics (SFL) (Halliday 1985; Martin 1992) include grammatical descriptions of images (O’Toole 1994; Kress and van Leeuwen 1996) see Kress, this volume, for differences between these two SFL-based approaches), of sound (van Leeuwen 1999), of action (Martinec 1998, 2000), and of three-dimensional space (O’Toole 2004; Stenglin 2004). The unifying theoretical principle underlying much of this research is Halliday’s metafunctions. This principle posits three metafunctions which simultaneously construe meaning: the ideational (representation and ordering of experience, oriented towards the field of discourse), the interpersonal (enacting social relationships, oriented towards the tenor of discourse) and the textual (organizing text, oriented towards the mode of discourse) (Halliday 1985).

In educational contexts in the science disciplines, recent investigation of multimodal representation on the page and screen has been carried out (Lemke 1998, 2000a, 2000b, 2002; Martin and Veel 1998; Miller 1998; Veel 1998; O’Halloran 1999a, 1999b, 2003, 2005, this volume; Baldry 2000; Thibault 2001; Guo 2004). However, apart from Baldry and Guo, much of this research has been confined to school-based contexts. In university settings, with the exception of Guo (2004), multimodal research has tended to focus on the ‘expert’ genres of the conference presentation (e.g. Rowley-Jolivet 2002), or the journal article (e.g. Lemke 1998; Miller 1998), rather than on multimodal genres in undergraduate science.

This chapter reports on research which aims to provide a social semiotic account of multimodality in print and electronic student learning materials in science at university. A particular objective of the research is
to explore the role of multimodality in the creation of technicality and abstraction in science.

There are two main motivating factors for this research, both of which are of an applied nature. One derives from my professional context in the Learning Centre (LC) at the University of Sydney. The role of the LC is to provide academic literacy support for all students regardless of language background, discipline or year of study. Increasingly, and in collaboration with staff in academic departments across the University, the LC has become engaged in curriculum design of online learning resources to support the development of students’ multiliteracies. Many of these projects have involved collaboration with departments in science and engineering. These include online report writing projects for undergraduate students in biology, biochemistry and chemical engineering. This work requires a deeper understanding not only of the multiliteracies undergraduate students need but also of how different disciplines construe meanings in the new learning environments. The other is to understand how SFL theory, which is the theoretical foundation for much of the teaching and research of the LC, can be extended to support a pedagogy for multiliteracies. At the core of such a pedagogy would be the development of a metalanguage for students and teachers to understand how meaning is construed in print and screen environments.

With this context in mind, the chapter will discuss selected results of the study. After describing the research design and the corpus, results of the visual content analysis will be presented. Next, the analyses of visual and verbal abstraction and technicality are discussed. The chapter concludes by considering the implications of the research for the teaching of multiliteracies for academic purposes.

2 The research design and the corpus

The research design consisted of two main stages, the first informing the selection of the texts analyzed in the second. The first stage involved a multimodal content analysis of a corpus of different types of computer-based and print-based learning materials in first-year science at university and the second stage involved SFL-based multimodal discourse analysis of a principled selection of these materials.

The corpus consisted of two chapters from textbooks used in physics and biology, interactive activities from two CD-ROMs accompanying textbooks in physics and biology, and activities from three websites designed for students in first-year physics, chemistry and biology. All texts covered the same general topic area in each discipline, e.g. fungi in biology, mechanical waves in physics. A total of 71 textbook pages and 192 screens were analyzed.
2.1 Multimodal content analysis

One of the criticisms of multimodal analysis within a social semiotic framework is that it is overly interpretive and not supported by empirical evidence (Bateman et al. 2002: 2–3). In selecting content analysis as the methodology, I was concerned to adopt a quantitative approach which complemented the subsequent qualitative multimodal discourse analysis. While clearly offering a different perspective on the corpus, quantitative approaches yield solid empirical data upon which to base further detailed analysis, and, in this study, provided a principled basis for selecting the texts for the SF semiotic analysis. Adopting a dual approach to analysis thus provides a multifaceted perspective on the texts, which can show both generality and complexity.

Content analysis is a very general approach to text analysis and recently, with computer-assisted techniques of analysis, the range of data has widened to include written and multimedia material such as books, advertisements, films, song lyrics, photographs, etc. (Bauer 2000). Bell (2001: 13) has defined content analysis as ‘an empirical (observational) and objective procedure for quantifying recorded “audio-visual” (including verbal) representation using reliable, explicitly defined categories (“values” on independent “variables”)’. Bell’s study of the front covers of an Australian magazine provides a useful insight into how content analysis can be linked to a semiotic model of the visual (Bell 2001: 27–31).

2.2 Categorization of content

One of the limitations of content analysis often cited is the ‘un-theorized’ content (Neuman 2000: 294; Bell 2001: 24). In Stage 1, I decided therefore, to draw on SF semiotic theory to inform the categorization of the content. Accordingly, as an integrating principle, the metafunctional orientation to meaning formed the theoretical basis for the categorization of the content.

The multimodal content was first divided into visual content, text blocks, animations, interactivity and sound. Visual content, text blocks and types of interactivity were also grouped according to which metafunctional meaning appeared to be foregrounded. Coding systems were then devised for categories of:

1) visuals and use of colour or black/white
2) technology used to create the visual content
3) location of visual on page/screen
4) proportion of text blocks to visual blocks on page/screen
5) text blocks and use of colour or black/white
6) font/font size
7) animation *
8) interactivity and its functions *
9) presence or absence of sound *
10) functions of sound.*

(* = only in screen texts)
The next section presents some key findings for the multimodal content analysis, focusing on analyses of visual content, and considering how this content varies according to page or screen format and to discipline.

3 Results of visual content analysis

The categorization of visuals was informed by typologies of visuals in scientific text within social semiotics (e.g. Lemke 1998; Thibault 2001) and other areas of inquiry such as the sociology of scientific knowledge (e.g. Lynch 1990; Myers 1992), and graphic design (Twyman 1979). I decided to distinguish the categories of photograph, photographic collage and micrograph, as not only was each of these three categories seen to perform a different function, different technology was used to create the images. Photographs were mostly used to depict the topic or field while photographic collage was a computer-enhanced assemblage of different parts of a photo or of different photos designed to add decorative interest to the page or screen. Micrographs are typical of the discipline of biology, and, while on one level they can be considered photographs, in that a camera may capture the image, the camera is affixed to a microscope and the image is taken through a microscope or similar device to show a magnified image. This produces a highly technical image and, unlike the photograph, tends to be recognizable only by a person with disciplinary knowledge. Equations were also included in visual content as, following O’Halloran (1999a, 1999b, 2005, this volume) and Lemke (1998), they employ mathematical symbolism as a semiotic resource distinct from verbal language. Also, they were often set off typographically from the verbal text or numbered, and as such were regarded as visual rather than textual blocks. The category of icon and its hypertextual counterpart on the screen texts were also considered part of the visual display, as they contributed to visual rather than to verbal content. Graphs were distinguished from scientific drawings and equations, since they serve a different

<table>
<thead>
<tr>
<th>Visual category</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photograph</td>
<td>* Photo collage</td>
</tr>
<tr>
<td>Micrograph</td>
<td>* Cartoon</td>
</tr>
<tr>
<td>Drawing</td>
<td>Logo, button or icon</td>
</tr>
<tr>
<td>Table</td>
<td>* Logo, button or icon as hyperlink</td>
</tr>
<tr>
<td>Equation</td>
<td></td>
</tr>
<tr>
<td>Graph</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1 Visual categories grouped according to metafunctional oriented meanings
function, although they often incorporated elements of each of these categories.

Ten categories of visuals were found, which were grouped according to their main purpose in the text and their orientation in the metafunctional organization of meanings. Within SFL, all meaning systems select simultaneously from the metafunctions, but at this point in the analysis, the visual categories were classified according to which metafunctional meanings appeared to be foregrounded, as shown in Table 5.1.

Categories in the left-hand column all contributed to the experiential content, creating the field-specific meanings and technicality. Categories in the middle column occurred only in the screen texts and were peripheral to the disciplinary content, adding ‘interest’ for the user in the form of cartoons or photo collage. Categories in the right-hand column focused on the organization of the text as a whole, e.g. through forward or back buttons or as ‘anchoring’ logos (e.g. University of Sydney, WebCT, publishers’ logos), pointing the reader/user to other information or to activities not visible on the active page or screen.

To determine the distribution of the metafunctional groupings of visuals across the texts, the total contribution of each group of visuals was calculated. The results are shown in Figure 5.1.

Different groups of visuals predominate in the textbooks and screen texts. In the textbooks, experientially-oriented categories far outweighed the other two groups, while in the screen texts, categories foregrounding

![Figure 5.1 Comparison of experiential, interpersonal and textual categories of visuals across texts](image-url)
the textual metafunction were dominant. The screen texts focused more on navigational types of visuals to orient the user to the organization of the content and the pedagogical activities, while the textbooks were more concerned with topic-oriented visuals, i.e. those foregrounding the experiential metafunction.

The range of visual categories for each text and the proportions of each category per text showed variation according to both discipline and text. The physics CD-ROM and the biology website showed the greatest range of visual categories with seven of the full range of ten visual types represented. This does not mean, however, that these two screen texts were more ‘visually’ oriented than the others, since in these two texts the visual content was doing more navigational work than experiential. When all the non-topic oriented categories, that is, those which contribute to navigation – logos, buttons and icons, and those which are interpersonally-oriented – photo collage and cartoon – are removed from the range, leaving the experientially-oriented categories, the disciplinary variation becomes more marked. Some categories only occurred in physics and chemistry, i.e. equations and graphs, while others, i.e. micrographs, only in biology. There was also a high proportion of photographs in the biology texts. Overall, the textbooks had a far higher proportion of experientially-oriented visuals than the screen texts. Perhaps this is not surprising as the volume of text and image in the textbooks enabled a greater coverage of the topic.

4 Visual density and proportion of visual blocks to text blocks

4.1 Analyses of visuality

Two analyses of visuality of the corpus were carried out, visual density and the proportion of visual blocks to text blocks. The measure for visual density (VD) was calculated as the total number of visuals counted for each text divided by the number of pages/screens analysed. For example, the biology textbook chapter has a total of 27 pages and 51 visuals, giving a

<table>
<thead>
<tr>
<th>Text</th>
<th>VD</th>
<th>VD1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Txt Bio</td>
<td>1.89</td>
<td>1.89</td>
</tr>
<tr>
<td>Txt Phys</td>
<td>3.48</td>
<td>3.39</td>
</tr>
<tr>
<td>CD Bio</td>
<td>2.62</td>
<td>0.62</td>
</tr>
<tr>
<td>CD Phys</td>
<td>4.26</td>
<td>0.96</td>
</tr>
<tr>
<td>Web Bio</td>
<td>3.62</td>
<td>0.6</td>
</tr>
<tr>
<td>Web Phys</td>
<td>1.72</td>
<td>0.1</td>
</tr>
<tr>
<td>Web Chem</td>
<td>10.15</td>
<td>1.42</td>
</tr>
</tbody>
</table>

Table 5.2 Comparison of visual density and visual density 1 across the texts
visual density of 1.89. Because of the high proportion of navigation visuals in the screen texts, a second measure of visual density (VD1) was calculated to give a more accurate representation of the visual density of the disciplinary content of the texts. VD1 refers to the total number of visuals without the icon/button/logo categories, the navigational cartoons and the photo collage images. Table 5.2 compares the VD across the texts in terms of two values, VD and VD1.

The highest VD was for the chemistry website while the lowest was for the physics website. This pattern changes for VD1, where both textbooks showed a higher visual density than the screen texts. This finding accords with Unsworth (1999), who also found visual sparsity of content-oriented visuals in screen texts. The bulk of the work being done by the visuals is for navigation rather than for depicting disciplinary content.

4.2 Proportion of visuals to text

Another measure of visuality which complements that of visual density is a measure of the proportion of visual blocks to text blocks. Three categories were devised to determine roughly how much space was devoted to visuals per page or screen. (A = more than 1/2 page/screen, B = 1/2 page/screen; and C = less than 1/2 page/screen). There was considerable variation across the texts. Within the textbooks, the visuals in the biology textbook occupied the largest amount of space, since half of the pages were in Category A, while in the physics textbook, less than 20 per cent of the pages fell into this category. In the screen texts, only the biology CD-ROM showed a greater proportion of space occupied by visuals than text blocks, with 70 per cent of screens in Categories A and B. The next highest proportion in the same categories was the chemistry website (about 60 per cent). The biology and physics websites and the physics CD-ROM showed that more space was assigned to text blocks than to visuals. In both textbooks the salience of many drawings, through their size, was also of interest, many of them occupying a full half page.

4.3 Location of visuals on page and screen

It was decided to track location of visuals to determine whether there was any consistency in location and ultimately, how layout contributed to meaning. Decisions about the location of visuals was also informed by the principles of graphic design and web design, such as the use of the vertical and horizontal axes and the underlying modular grid (Nielsen 2000; Gillieson 2003). Following Halliday (1985: 274–8) on information structure, Kress and van Leeuwen (1996) posit that meanings are realized by the placement of visual elements in various ‘zones’ on the page (or screen) e.g. right–left; centre–margin; top–bottom. For example, elements placed on the left are described as Given or ‘commonsensical, self-evident’, while elements on the right are described as New or ‘something
which is not yet known . . . problematic, contestable . . .' (Kress and van Leeuwen 1996: 187; however, this concept has also been challenged by other multimodal researchers such as Bateman et al. 2002). Both the textbook and screen text visuals occupied a large number of locations on the page and screen, ranging from 18 in the physics textbook to six on the biology CD-ROM. The high number of locations in the physics textbook was due to the high proportion of equations, which need to occupy a wide variety of positions on the page, since they are integrated more closely than other visual types into the running text. Visuals such as photographs, micrographs or drawings have fewer possible positions due to page/screen size and design constraints. Moreover, the space that these three categories occupy tends to be larger than that for equations, particularly in the case of textbook visuals.

The location of visuals appears to be more related to the underlying design grid of the page or screen than to information value. For example, the underlying grid of the biology textbook page is two vertical columns divided into a possible maximum of eight blocks, which can each be occupied by text or image. These eight blocks are more or less arranged on the horizontal axis as four pairs of adjacent blocks. In their discussion of left-hand (Given) and right-hand (New) relations in magazine layouts, Kress and van Leeuwen (1996: 189) claim that the Given space is often occupied by the verbal text while the New is occupied by images. In the textbooks, there was no such pattern. In both textbooks, verbal text occupied left and right position equally on the page, although the proportions of text varied. In the biology textbook, where the page is divided into two equal columns, images occurred more on the left than on the right but in the physics textbook, the reverse was true. The constraints of space may also play a role in the layout and design of large complex university textbooks such as these.

To sum up, in terms of experiential content, the visual density is higher in the textbooks and a higher proportion of visuals contribute to this content than in the screen texts. Moreover, many of the visuals in the textbooks are highly salient, and display a complexity and intricacy which has been achieved by employing advanced technologies in their production. The high proportion of textually-oriented visuals in the screen texts means that the visual mode is used more for navigation than for teaching subject content. Visuals are generally allocated less space than text blocks on the screen and there is less variation in the range of visuals than in the range of text blocks. There is clear disciplinary variation in the types of visual consistent across page and screen texts. Finally, the location of visuals is more variable on the page than on the screen and is influenced strongly by the design grid. It has been claimed that the textbook is being influenced by the logic of the screen (Kress 2003: 7–8) and that compared with 40 years ago the functional load of textbooks is now carried by the image. The results of the visual content analysis present evidence which challenges this claim.
While the focus in the preceding discussion has been mainly on visual content, the multimodal content analysis of this study yielded some solid empirical data on the distribution of text, image, sound and interactivity according to format and discipline. On the basis of these data it was observed how discipline and format can determine such content. Although it is important to acknowledge the limitations of content analysis, it provided a set of principles on which to make an informed selection of texts for the SF semiotic analysis, the focus of the second part of this chapter.

5 Visual and verbal technicality and abstraction

In the language of science there is a complex interrelationship between the lexical and grammatical resources of elaboration and distillation, superordination and composition used to set up technicality and abstraction. Technical terminology is identified, defined, ordered and explained so that generalizations can be made about classes of participants. Grammatical metaphor plays a vital role in this technicalizing process (Halliday 1998). However, in constructing the technicality of a discipline, language is not the only meaning system involved. The concept of technicality also includes an understanding of how multimodal meaning resources, such as image, typography and animation contribute to technical meaning. A microscopic image of a spore which can be seen in a textbook or animated on the screen is read or viewed in conjunction with a definition or explanation in the verbal text. A technical term may be highlighted in a text through typographical resources such as colour, bold face or italics. On screen, the technical term may be hyperlinked to a glossary which defines and explains the term or to a databank of images. An image may also be represented in increasingly more abstract ways, when we compare a photograph with an abstract drawing or a graph, for example. Different types of images may range along a scale of abstraction, from the most naturalistic representation to the least. In this process, other variables come into play, which relate to the degree of abstraction of a certain image. The image may depict a certain representation of events and participants or represent these as generic. It may show surface characteristics or the underlying structure of an object. From the field of visual rhetoric, the work of Beck and Osman-Jouchoux (1992) and Mishra (1999), for example, provide useful insights into the concept of abstraction in scientific and technical images.

5.1 Verbal technicality and abstraction

In order to establish the extent to which the verbal text displayed co-variation in the grammatical resources typical of complexity in scientific discourse, measures for lexical density, technicality and grammatical metaphor were calculated for a total of 887 clauses in six texts – two
textbooks, two CD-ROMs and two websites – as a prelude to the analysis of visual technicality and visual abstraction. I was also interested to determine if any variation in the measures was related to discipline or format. The grammatical resources which contribute to technicality, which have to do with the semantics of elaboration and taxonomic relations among participants (Martin 1986: 20–2) were therefore tracked across the texts. Based on these resources, a table of categories of technicality was set up and a measure obtained for each text by dividing the number of instances by the number of ranking clauses. The measure included grammatical resources and field-specific technical terms and was based on the analytical categories in Jones (1991). Grammatical metaphor analysis was carried out in a similar way, with a table of categories of metaphor set up to track the number of instances through the texts. The table of categories extends those proposed by Jones (1991) and Ravelli (1985). The following extract from the corpus illustrates the grammatical metaphor analysis, in which the instances are marked in bold:

Cl CHEMISTRY WEBSITE: CHEMICAL EQUILIBRIUM MODULE
4 Some chemical reactions continue
5 until one reagent is effectively completely consumed.
19 The reaction has reached a condition where the reaction of reactants forming products (left to right) is occurring at exactly the same rate as the breakdown of products to re-form the reactants.

72 Although concentrations can be used,
73 in describing gaseous reactions
74 it is quite common
75 that the equilibrium law is written in terms of the partial pressures of the substances taking part in the reaction.

Nominalizations of material Processes and Things metaphorically realized as Epithets or Classifiers were the two most frequently occurring sub-categories in all the texts. In the chemistry website module on chemical equilibrium, for example, nominalizations of material processes accounted for over half the measure of grammatical metaphor. It was used to build up the technicality about the behaviour of chemical reactions as they approach equilibrium. Technical terms reaction, reactant, product, concentration, pressure are all instances of nominalized material processes. In the same text about one quarter of the instances were Things realized as Epithets or Classifiers, which also contributed to technical taxonomies through Classifier^Thing structures such as reactant concentrations.

Finally, lexical density as a measure of the average number of content words per clause was calculated. The three measures tended to occur as co-varying patterns in all texts. High lexical density was associated with high measures of technicality and grammatical metaphor – for example in the biology textbook – and low lexical density with low measures of grammatical metaphor and technicality – for example in the physics CD-ROM. Both the biology and physics textbooks displayed similar measures of lexical density and grammatical metaphor, although technicality was
higher for all biology texts. This suggests that variation appears to be associated with format rather than discipline, a point which was reinforced by the content analysis discussed above. The verbal text in textbooks serves the important pedagogical function of building discipline-specific knowledge which is both technical and abstract.

5.2 Visual technicality

If a reconstrual of experience occurs through the grammatics of technicality and abstraction in scientific discourse what kinds of reconstruals are taking place in the images which accompany the text and, if scientific verbiage and image co-occur, do they also co-vary? In order to track the relationship between verbal and visual technicality, the proportion of visuals contributing to technicality and field-specific meaning (i.e. photos, micrographs, drawings, tables, equations and graphs) was represented with the measure of technicality for the verbal text. Figure 5.2 shows the results of these two measures.

In the textbooks there was a strong relationship between verbal and visual technicality, in that the high proportion of visuals contributing to technicality corresponded to high measures of technicality. The relationship is less clear in the screen texts. This can be partly explained by the fact that in the screen texts, the visuals are doing more navigation work than field-oriented work, as was discussed earlier in the content analysis. The relatively high measure of verbal technicality for the biology CD-ROM can be explained by the use of a glossary of technical terms with hyperlinks to the term and its definition or explanation. This glossary is not, however,
elaborated in the visual mode. In the textbooks, the visuals played a much more significant role in constructing field than in the screen texts. The CD-ROMs and websites have similar proportions of technical visuals, although those of the websites are slightly lower.

5.3 Visual abstraction

Next, the relationship between visual and verbal abstraction was investigated by comparing the measure of grammatical metaphor with a measure obtained for visual abstraction. Following Kress and van Leeuwen (1996: 159) and Unsworth (2001: 89–90), abstract images were taken to be those which involved a shift from concrete reality, removing them from familiar representations of events, participants and places in the concrete world. Aspects of form, function, setting and other detail are removed to render the whole image, or parts of the image, abstract. Although visual abstraction is not completely analogous to verbal abstraction or grammatical metaphor, there are some points of contact. One is the shift from concrete to abstract, which occurs in both systems of semiosis, resulting in a reconstrual of experiential meaning in the perceived world. Another is the shift from specific to generic which takes place through grammatical metaphor in language and through the depiction of elements of the image as generic or typical rather than specific. The relationship between abstraction in text and in image in pedagogic texts is seldom made explicit to students at university and would be a very productive area to explore in developing a pedagogy of multiliteracies.

Four categories of visuals were considered to be abstract: drawings, tables, equations and graphs. A measure of abstract visuals for each text

![Figure 5.3 Grammatical metaphor and abstract visuals](image-url)
was obtained by calculating the proportion of these categories of the total number of visuals for the text.

There was some co-variation in the measures for abstract visuals and grammatical metaphor, as shown in Figure 5.3. In part, similar patterns of co-variation to those found in visual and verbal technicality occurred. The highest proportion of abstract visuals corresponded to the highest measure of grammatical metaphor, or verbal abstraction, in the physics textbook. However, a low measure of abstract visuals corresponded to a high measure of grammatical metaphor in the biology textbook and CD-ROM. The websites had a lower proportion of abstract visuals than the CD-ROMs and the textbooks, but a medium-high grammatical metaphor measure. This can be explained by disciplinary differences in the choice of abstract visual. In the biology textbook, photographs and micrographs, which are seen at this stage to contribute to technicality rather than to visual abstraction, were predominant, while drawings occurred less frequently and graphs and equations not at all. The reverse was true in the physics textbook, where drawings, equations and graphs formed 92 per cent of the total number of visuals.

5.4 The four measures

When all four measures are plotted together, interesting patterns emerge. Apart from the biology textbook, the values for visual abstraction and technicality were similar. Low or high measures of visual abstraction corresponded to low or high measures of visual technicality. In the screen texts

![Figure 5.4](image-url)
the four measures form a somewhat different pattern. On the websites, low visual measures corresponded to medium verbal measures, while on the biology CD-ROM, low visual measures corresponded to high verbal measures, and on the physics CD-ROM, medium visual measures to low verbal measures. The only high visual measures were found in the textbooks, with the physics textbook showing strong correspondence in all four measures. The relationships can be seen in Figure 5.4.

Seen together, the measures reveal a relatively strong trend of co-variation, although the patterns differ depending on format and discipline. This may be expected in such pedagogic genres in science, where visual and verbal semiosis have to work closely together to create highly explicit technical and abstract meanings for the student. In expert genres such as research articles, the interrelationships may not need to be as explicit, since the expert reader will have a high level of insider knowledge.

6 Conclusion and pedagogical implications

In pedagogic texts, highly technical and abstract images are mediated by labels, captions and the main text. To an expert eye it may be possible to read such images without verbal explanation or elaboration, but for the student, the verbal text plays a vital role in translating the meaning of the image. Moreover, the principles of selection of images for pedagogic purposes may be quite different from those for expert genres such as research articles, since images, like text, are social constructs and serve different functions in different genres. In textbooks for science, images are not there to ‘prove’ a point in a particular piece of research but rather to present generalized ‘evidence’ for accepted knowledge, as Myers (1992) has noted. What then are the implications for pedagogy, curriculum and research of the new literacy demands for today’s university students? As alluded to in the introduction, the pedagogy in the complex new learning environments does not acknowledge the challenges for students of the ‘new dimensions of multiliteracies afforded by information technology’ and the need for ‘meta-semiotic knowledge’ (Unsworth 2001: 12). Such complex learning environments certainly warrant a pedagogy which considers multiliteracies and the differentiation of discipline-specific literacies. A crucial component of a new pedagogy for multiliteracies is that of a metalanguage for ‘an open-ended and flexible functional grammar’ (Cope and Kalantzis 2000: 6) that describes multimodal meaning resources in their contexts of use. In university contexts, the metalanguage of SFL has been effectively used in the development of academic literacies and in transdisciplinary approaches to teaching and research. Jones (2004) provides an overview of some of the key references in this area. Further analysis of multimodality and intersemiosis will help to extend the metalanguage, thereby opening up possibilities for incorporating into pedagogy a description of how different forms of semiosis work together to expand
meaning potential in any discipline. This entails collaborative approaches to developing students’ multiliteracies, which combine different areas of teaching expertise in multimodal semiotics and in disciplines such as the sciences.

The new learning technologies are here to stay in our universities. The challenge for the future will be to move beyond research which sets out to establish the superiority of such technologies over traditional technologies. It is hoped that insights from research such as that presented here can be used to inform educational design of screen and print-based pedagogical genres in science and lead to a more critical perspective on a pedagogy of multiliteracies in the wider university community.

References


Part II: Discourse Analysis and Education
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6 Applying a Critical Systemic-Functional Literacy Frame in a UK Secondary Education Context

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1 Introduction

This chapter considers the potential of a research-based pedagogical, analytical and heuristic tool for the critical analysis of texts, the Critical Systemic-Functional Literacy Frame, and provides recommendations for pedagogy, curriculum, teacher education, policy and further complementary research. The Frame offers an approach to the consideration of the construction of dominant discourses, as well as directions for challenging such discourses, leading to social action and social change. This chapter is grounded in a social-constructionist orientation to language and through approaches based on Systemic-Functional Linguistics (SFL) and Critical Discourse Analysis (CDA), seeks to consider the ways in which insights from such an approach can be useful in educational contexts. This work is further informed by literature in the areas of language and power, media discourse, specifically broadcast interviewing, and critical pedagogies.

Systemic Functional Linguistics (Halliday 1985) argues that the way in which people make sense of the world is through language – it is a discursive process. Language is a social semiotic system which, instead of drawing meanings passively from pre-existing knowledge of the world, plays an active role in classifying the phenomena and experiences through which individuals construct, understand and represent reality. The way in which people make sense of the world is therefore discursively mediated. Over the past 20 years concerns have been growing as to how this can be reflected in a range of classroom contexts through an emphasis on notions of more critical literacy practices.

In terms of pedagogy and practical classroom application this chapter will look at how SFL-based critical literacy tools can be incorporated into
secondary education, in particular in light of recent UK policy initiatives in the area of Citizenship teaching. My aim is to emphasize the value of being able to ‘unpack’ various texts/genres/discourses as a tool for understanding how language is employed to make meanings, and specifically how this can be introduced into one secondary education context. Through such critical understanding, the aim is to help learners to make representations, agendas and positionalities more transparent, and to be aware of the opaqueness and provisionality of language use.

1.1 Why a Critical Systemic-Functional Literacy Frame?

In education, texts are one of the central tools of our trade. Yet there is evidence that we still fail to address these texts critically in many instances. For example, Grady (1997) offers a critique of how textbooks can operate to perpetuate the economic social and political status quo that privileges certain groups over others. There has been a long and valuable history of critical literacy theorization and practical classroom application, particularly in the Australian context. Whilst there have been differing varieties of and developments in critical literacy (Shor 1992; Morgan 1996; Luke and Freebody 1997; Janks 2002), all share a concern with the inter-relationships between language, power and social practices. Whilst the classroom potential for these concerns to be aired has received extensive treatment in the Australian context (Luke et al. 1994; Morgan 1996) I would contend there is a parallel need for considering how this debate can be extended to the UK secondary classroom for both learners and learner–teachers. We can only be better equipped as language teaching professionals if we understand the ways in which language operates to construct meaning, and the fact that this operation takes place on a number of levels.

1.2 Theoretical influences on the frame

Throughout this chapter, it is important to remind ourselves that context is central to the use of language and also fundamental to a view of language as ‘social semiotic’ (Halliday 1978) – it is social in that it is a system of communication shared and mutually intelligible by its particular speech community, and semiotic in that it is a system of signs that convey meaning about a particular culture of its users. Any analysis of meaning in language, therefore, needs to consider both linguistic and extra-linguistic factors.

Drawing on this conceptualization of language and on the post-modern social theorizing of Foucault (1981), Pêcheux (1982) and Bourdieu (1991), Fairclough (1992: 28) notes that language cannot be seen as being divorced from its social relations. Language constructs and is constructed by society. If language is invested with power relationships, then an understanding of power is central to an understanding of language use, particularly in the way in which the control of this shaping power can be
used as a tool for influence and authority. Of particular relevance here is
the process of ‘naturalization’ (Fairclough 1989) in which language acts as
a social control agent, through which members of society are conditioned
to accept conventions and practices that may not be in their best interests,
these language practices and conventions being represented as ‘common-
sense’, inevitable and beyond challenge. However, the key aim of a critical
approach to language teaching resides in attempts to uncover the process
of naturalization in any discourse, and through the problematization of
the accepted conventions and practices, seeks to show how meaning
‘...because it is socially constructed, can be deconstructed and recon-

dominant practices and conventions may be confronted with alternative and opposi-
tional ones, with different valuations of languages and varieties, or different
ideological investments.

This move to a more critical notion of pedagogy, then, is the principal aim
of the textual ‘uncloaking’ of language.

It is the intention of this chapter to provide a practical classroom tool,
and so I have opted for a set of criteria that will allow learners and teachers
to look at elements of the text at both a ‘micro’ lexico-grammatical level,
as well as consider the impact of such choices at more ‘macro’ semantic
and societal levels. The work is largely grounded in my own research on
this area (Hyatt 2003), which itself was informed by key work in SFL
(Hunston and Thompson 2000; Martin 2000), in the field of CDA
(Fairclough 1995a), and in Critical Literacy (Luke and Freebody 1997).

2 The Critical Systemic Literacy Frame

The Frame was developed from a research project involving the analysis of
a corpus of political interviews and interview data from participants in such
a discourse. The use of this Frame is currently the subject of a further
research project in the School of Education, University of Sheffield,
working with teachers and learners from local secondary schools. In this
project we are attempting to ascertain the views of teachers and learners as
to the value of such a Frame, and more specifically with teachers working
to consider the ways in which such a Frame can be used within current
curricular and policy constraints. Underlying this project is our contention
that policy and practice cannot be viewed as discrete, and that pedagogy is
always located within institutional contexts. This chapter takes as a starting
point that valuable teacher development has to recognize that such
contexts are influential and teachers need to engage not only with what
they do in the classroom but how and why. The examples used in this
section come largely from classroom contexts, on initial and continuing
professional development programmes. The teaching sessions were based
around considering the potential of using critical literacy in a range of
English teaching contexts, and in turn the materials discussed were based
on a number of corpora illustrating educational, media and advertising discourses. I propose a Frame for a critical approach to reading texts, genres and discourses with the following criteria:

1) Pronouns – Participant Choices
2) Passive / Active Forms – Transitivity Choices
3) Time – Tense and Aspect
4) Adjectives, Adverbs, Nouns, Verbal Processes – Evaluation and Semantic Prosody
5) Metaphor
6) Presupposition / Implication
7) Medium
8) Audience
9) Visual Images
10) Age, Class, Disability, Gender, Race / Ethnicity and Sexuality Issues
11) Reference to other texts, genres, discourse and individuals

The criteria have been ordered for pedagogical purposes in order to allow learners to move from the more micro elements of lexico-grammar, through discourse semantics, register and genre. This allows learners to locate texts in relation to both linguistic and extra-linguistic features, central elements of SFL theory (Eggins 1994).

The subsequent sections offer a brief general gloss as to how I feel these criteria are relevant the classroom-based analysis of how texts work.

2.1 Pronouns – participant choices

This aspect of the Frame considers the way in which pronouns may be used in the text, whether they are inclusive (our, us, we, etc.) or exclusive (they, their, them, he, she, it, you, your, etc.). It also considers how the reader and other participants are positioned as allies or in-group members with the author, thus assuming shared knowledge, beliefs and values, or how readers and other participants are marginalized as ‘outsiders’ with different beliefs and agendas. Pronouns are central to the way individuals and groups are named and so are always political in the way they inscribe power relations (Brown and Gilman 1960; Pennycook 1994). For example, the ‘I’ that is authoring this thesis is in many ways different to the friend, colleague, parent and partner that exists in other contexts, in that only certain values, beliefs and feelings are engaged with by the authorial ‘I’. It is therefore a partial and highly selective construction of this author, and so the pronominal can be a tool to present that which the author wishes to present. This view is though tempered by an awareness of Ivanič’s writing on authors’ discoursal construction of the self, or the ‘impression – often multiple, sometimes contradictory – which they consciously or unconsciously convey of themselves in a particular written text’ (Ivanič 1997: 25).
2.2 Activization / passivization

Transformations of active constructions into passive forms can be motivated by the desire to elide agency and therefore systematically background responsibility for actions in some instances or to foreground responsibility in others (Fowler et al. 1979). The manipulation of agency transparency serves to construct a world of various responsibilities, and power, e.g. ‘The present perfect is used to . . .’. By removing the agent, the use of a particular grammatical form, in this case the present perfect, is given an unquestionable, universal function, in spite of its context of use. Such an analysis is almost always absent from textbooks and grammar reference books using such definitions.

I feel, however, that it is important to note that to assume that such a basic transitivity shift as passivization or activization would lead to a complete shift in the understanding of the reader would be an over-simplification and patronizing to the reader. However, the construction is effected through a layering of strata of representations and the claim for relevance of this aspect of the Frame is one of these myriad strata. Within this chapter, for example, I use passivization to highlight activity rather than individuals (as in the example later of The first steps towards my development of a Critical Systemic Functional Literacy Frame have been enhanced by collaborative classroom analysis and discussion with learner–teachers), though my intention here is not to elide the agents, and so I have been at pains to attempt to make these clear.

2.3 Time – tense and aspect

This relates to the way in which tense and aspect are used to construct ‘understanding’ about events. For example, the use of the present simple tense constructs an event as reality or fact; the use of the present perfect simple constructs a past event as being of relevance at the moment; the past simple tense can represent a past event as no longer being important or relevant. The effect of tense choices can be demonstrated by converting the past simple tenses to present perfect and vice versa and noting the different semantic effects. For example my own use of the present simple tense in this article (e.g. the way in which people make sense of the world is through language – it is a discursive process, above) constructs such statements as fact, though clearly this is only so from my own perspective.

It is therefore important to understand that choices made in terms of tense and aspect are not merely concerned with the time frame of an action or process but also impact clearly on the representation of that action or process as true, relevant or significant.
2.4 Adjectives/adverbs/nouns/verbal processes

The use of loaded, dramatic and stereotyping adjectives, adverbs and nouns are central to the construction of an event or a person, whether or not that construction is evaluating its object positively or negatively. Also the use of non-hedged adverbs, such as surely, obviously, clearly and so on, position a contention as being incontrovertible ‘fact’. The use here of overgeneralization and overstatement is worthy of note. All-inclusive expressions (all, every, none, no one, always, never, etc.) are rarely accurate, but can be used to construct a generalizing, stereotyping or over-simplifying evaluation. Other comment adjuncts expressing the authors attitude to the whole proposition, such as ‘constantly’, ‘totally’, ‘entirely’, ‘absolutely’, ‘wholly’, ‘utterly’, etc. fulfil the same purpose.

The concept of evaluation is useful here. Hunston and Thompson (2000: 5) define evaluation as ‘the broad cover term for the expression of the speaker or writer’s attitude or stance towards, viewpoint on, or feelings about the entities or propositions that he or she is talking about’. Evaluation can further be divided into two main categories, *inscribed* and *evoked* (Martin 2000). In the *inscribed* category the evaluation is carried by a specific lexical item, overtly displaying the attitudinal judgement of the text producer, e.g. excellent, terrible, etc.

*Evoked* evaluation uses superficially neutral ideational choices but which have the potential to evoke judgemental responses in those who share a particular set of ideological values. These evoked evaluations in themselves do not denote the text producer’s attitude to the content overtly, but leave the value judgement to the reader/listener. However, they are mechanisms through which evaluation is covertly constructed. For example in tourism texts (Cunha de Freitas 2000) the terms natural and sunny help to construct a positive image and in food promotional text terms such as natural and organic operate in a similar way. Negative evaluation can also be constructed by terms such as suspected in suspected asylum seeker. Such mechanisms can be seen as powerful devices in the role they play in projecting a notion of ‘common sense’. An example from this chapter that could be critiqued by those with differing ideological or pedagogical positions might be my use of the term ‘critical’ in a positive sense, when this assumption points to my own ideological and pedagogical positionality.

Another useful conceptual notion here is Semantic Prosody. For Hunston and Francis (2000: 137): ‘a word may be said to have a particular semantic prosody if it can be shown to co-occur typically with other words that belong to a particular semantic set.’ These semantic sets are often positive or negative. For example, Stubbs (1995) illustrated that more than 90 per cent of the words collocating with the word cause were negative, e.g. accident, cancer, commotion, crisis and delay. Stubbs also gives an example of positive semantic prosody – provide – which has amongst its typical collocates words such as care, food, help, jobs, relief and support. A powerful
illustrative example of these differences comes if one collocates both *provide* and *cause* with the word *work*, and the outcome is clearly one of positive associations with the former and negative associations with the latter.

2.5 Metaphor – literal and grammatical

Metaphor is more than just a literary device – it plays a fundamental part in the way people represent social reality. The use of metaphor can imply certain evaluations regarding what is described, and also act to suggest the ways in which the reader should relate to the metaphorized entity. This is starkly seen in the description of individuals or the personification of entities, e.g. Saddam Hussein as a ‘monster’, Margaret Thatcher as the ‘Iron Lady’, etc. It is important to realize that the metaphor and its alternative congruent or literal form do not express exactly the same meaning – indeed the purpose of metaphor is functional in that it serves to construe a differently foregrounded meaning than its alternatives. Metaphors are neither better nor worse than their congruent counterparts – they are simply performing different functions (Thompson 2004: 221). It is also important to be aware that alongside lexical metaphors we find in certain text types grammatical metaphors.

One clear example of grammatical metaphor is nominalization, or presenting as a noun or noun phrase something that could be presented with other parts of speech, e.g. *her understanding* as opposed to *what she understood*. This has the effect of making a text more ‘lexically dense’, a feature commonly noted with ‘written’ texts. Characteristic of this are more ‘packed’ texts, texts that are more information heavy, which can make these texts appear more prestigious, academic and serious. It can construct an argument as significant and well thought through, though also produce texts that are opaque and inexact. Ivanić (1997: 267) notes that through the process of nominalization ‘...writers identify themselves with those who engage in such knowledge compacting, objectifying and capturing practices’ and so can represent themselves as ‘intellectual’ or those who use ‘reasoned thought’. The earlier example of passivization is another example of grammatical metaphor through which the agent is suppressed – in academic discourse this can work to assert that a proposition is unchallengeable, or at least to make the source of the proposition more difficult to identify and therefore difficult to challenge, e.g. ‘It has been proved that...’.

2.6 Presupposition / implication

Presuppositions help to represent constructions as convincing realities (indeed within this chapter, there is a presupposition that language is not used in a neutral, apolitical sense). There are a number of lexicogrammatical means by which this can be achieved:
• the use of negative questions and tags which presuppose a certain answer
  – isn’t it the case that. . .?, wouldn’t it be fair to say that. . .?, you’re in even more
trouble, aren’t you?;
• the use of factive verbs, adjectives and adverbs, verbs that presuppose
  their grammatical complements, adjectives and adverbs that describe
  entities and processes they presuppose, and therefore represent them as
  facts – we now know. . ., we realize. . ., we discovered that. . ., you forget that. . .,
  I believe that. . ., as you will be aware. . ., odd. . ., obvious. . ., previously. . . and
  so on. Factive verbs have been identified in Hoey (2000) as a form of
  embedded evaluation;
• the use of change of state verbs which presuppose the factuality of a
  previous state – when did you stop beating your wife?, their policy on
  Europe has changed. . ., this school has improved. . .; transform, turn into,
  become, and so on;
• the use of invalid causal links presupposing that if one fact is true then
  the next is also true – ‘90% of my class passed FCE this year, 80% of my class
  passed last year, therefore my teaching is getting better. . .’;
• rhetorical questions pre-suppose the answer implied by the questioner
  (Is it not reasonable to ask the PM such questions?), or provide the questioner
  with the opportunity to answer their own question, a question they have
  framed and therefore imply the self-response as ‘true’ (What did they do
  to British manufacturing industry? They destroyed it, that’s what).

2.7 Medium

Hasan (Halliday and Hasan 1985: 58) usefully differentiates between the
notions of channel and medium. The channel refers to whether the
message come to the addressee via sound waves – phonic; via some form of
writing – graphic; or via sign language – visually. Medium refers to the
grammatical complexity and lexical density of wordings, which represent it
as written or spoken, e.g. though a personal letter to a friend is received via
a graphic channel, it is worded as if the writer is speaking to the addressee.
This is achieved by reducing lexical density, increasing grammatical
complexity (both features of spoken rather than written language) and
exploiting the reader’s knowledge of the text type, as well as other shared
knowledge. An example of this comes with the presentation of advertising
copy in a conversational style, which serves to imply a close social
relationship between the copywriter and the reader, which does not exist.
This ‘masquerade’ (Hyatt 1994) of friendship, a shared communication
with a trusted confidant, an individual projected as someone you can
believe in, who wouldn’t lie to you, who has your best interests at heart, can
predispose the text receiver to believe what the text producer is communi-
cating.

This type of conversationalizing of a text is a form of interdiscursivity (a
notion as taken up in section 2.11), which goes beyond the ways in which
texts borrow from, steal from and interpenetrate each other, to the ways in
which genres and discourses do this. Examples of interdiscursivity can be seen in the way in which the discourse of business has penetrated the discourse of higher education (Fairclough 1993), with the perception of students being addressed more explicitly as customers and the attendant implications of this managerialist discourse – ‘value for money’ and ‘accountability’ being associated positively with this change, whilst the changing perception of teachers as constantly being in need of excessive scrutiny (Hargreaves 1994; Smyth 1995), and of viewing teachers merely as technicians, being negatively associated by many educational professionals.

Taking the example of political interviewing, some of the techniques for achieving this ‘conversationalization’ are listed below:

- **Use of a Narrative Present tense:** This tense usage suggests the narrative progression that is often associated with day-to-day conversations.

- **The representation of the talk of others, including the interlocutor:** This is a technique for offering an antagonistic proposition without direct face-risk to the propositioner. It is also a feature in the simulation of the voice of others, again representing the ‘talk’ as a conversation, e.g.:

  ‘And when you’re actually looking at the books, what’s some economists were saying is that the deficit is too big and, in fact, taxes are too low.’

  ‘Can you say tonight that you are actually saying to them, “No, I guarantee, I am not going to put my hat in the ring for the next two weeks at least”?’

- **Use of Present Continuous with narrative, verbal processes:** As discussed in Carter and McCarthy (1995) this is a grammatical feature of spoken discourse, and can be used to emphasize the act of saying, as opposed to the substantive content of what is being said. Logically, therefore, it is a feature of spoken discourse.

- **Conversational language – Discourse markers:** Again there are myriad examples of functional discourse markers, such as *so, anyway, I mean…, Well, OK, etc.* which also contribute to the reading of these exchanges as spoken discourse.

### 2.8 Audience

Central to the notion of language as a social semiotic is the idea that language is utilized for some form of communication, and therefore a party or parties at whom communication is aimed, in other words, the audience. Any analysis would therefore be inadequate if it did not focus some attention on who is perceived as being the audience, and how they are projected in terms of social distance – relationship to and familiarity with the text producer – and status. In light of the fact that there is no way that the author can know exactly who the audience is, the notion of audience can be read as an idealized, projected construction. In this idealization and projection, clues can be found as to the ideological presuppositions of the text producers. Features that could be sought under
this criterion might include any specific identification of an intended audience, a consideration of the ‘usual’ readership of the source of the text, and the way in which the author/audience relationship is constructed, in terms of register, social distance, participant roles and process sharing. Within this chapter I, and the editors who have commented on various drafts of this chapter, construct the intended audience as teachers, or a wider audience than just applied linguists, and so the exemplification, level of theoretical engagement and register used have be chosen with this in mind.

2.9 Visual images

Significant recent work in these visual and multimodal areas has been conducted by Kress and van Leeuwen (2001: 4), particularly looking at: ‘The four domains of practice in which meanings are dominantly made... Our four strata are discourse, design, production and distribution.’

In this theory of multimodal communication, discourses are seen as socially constructed knowledges of reality, designs are the uses of semiotic resources to realize discourses, production refers to the ‘organisation of the expression, to the actual material articulation of the semiotic event’ (Kress and van Leeuwen 2001: 6) and distribution as the facilitation of the pragmatic functions of preservation and distribution. They argue then that in a multimodal age, we need to pay attention to the text, but also to the way this is mediated – how it is designed and produced, how it is distributed and how it is consumed and interpreted.

Historically, the association of the camera recording ‘a set image’, and as such being associated with ‘truth’ and ‘objectivity’, has impacted on the way visual images are read. Leaving aside the potential for the manipulation of images, and the potential for displaying an image with a constructed impression of its contextual setting, visual images do play a powerful role in the construction of truth and reality. In this respect there are clear relationships with notions of hegemony in presenting a picture of ‘this is how it is’. As Fairclough notes (1995b: 7) images have primacy over words, in the sense that events in news broadcasts are usually first visually enacted before the audio track describes them in words. Within this category, indeed for example within this subsection, use of font size, and italicization, are used to highlight certain features identified by the author as significant.

2.10 Age, class, disability, gender, race/ethnicity and sexuality issues

Within a text it can be revealing to consider any comment regarding individuals who may be projected as less socially valued, in terms of age, gender, disability, etc. in order to legitimize the assertions of those who hold power, or to identify any pejorative or stereotyping presentation or labelling of such people as being a ‘normal’, naturalized and commonly-shared
viewpoint. Whilst such issues are central to any approach concerned with the relationships of language to power, I feel it is justifiable to direct teachers and learners to consider the effect these issues have on marginalized groups.

Cole (2001) has described the impact that labelling has had in the area of educational inclusion, noting Ballard’s (1995) argument that the language of Special Educational Needs and in particular the term ‘special’ ensures continuing segregation. Corbett’s (1996) use of the term ‘bad mouthing’ to represent the type of labelling which lays the blame for barriers to inclusion on individual ‘deficit’ rather than systemic failures, such as the cultures, practices and policies of educational institutions, is an illuminating metaphor in this context. Perhaps, in the classroom context, it is useful to consider the grounds for the evaluation and labelling of students as ‘good’, ‘bad’, ‘bright’, ‘thick’, ‘high ability’, ‘low achieving’ and so on.

This chapter’s conception is grounded in a social justice agenda, itself aimed at addressing inequalities constructed, reinforced and reproduced by the unproblematized use of language.

2.11 Reference to other texts, genres, discourses and individuals

One consistent way in which texts from all genres seek to establish the legitimacy of their claims, their common sense assumptions and their worldviews is through reference to other texts, genres, discourses and individuals. Fairclough (1992) offers the terms interdiscursivity (or constitutive intertextuality) for the wider appropriation of styles, genres and the ideological assumptions underpinning discursive practice. Interdiscursivity operates on a more macro level than intertextuality and refers to the diverse ways in which genres and discourses interpenetrate each other, as is clear in the regular co-penetration of the discourses of advertising, science and medicine, and the discourses of academia and consumerism (Fairclough 1993). Intertextuality is perhaps better viewed as the identifiable (either clearly or more indistinctly) borrowings from other texts. Quotation from, citation of and reference to other texts are transparent examples, whereas the use of phrasing, style and metaphor originating in other texts may be more opaque, yet equally revealing.

The impact of intertextuality, where used as a technique for particular construction, representation and projection of preferred meanings, can be to support, reinforce and legitimize the argument of the writer. Careful selection and editing of ‘borrowed’ texts, and the utilization of other genres and discourses can achieve required evaluation, yet reference to other texts, directly through quotation or indirectly, retains projected links to ‘reality’ and, hence, claims for the truth-value of the assertion. Key figures are often used as their status is used to imply a legitimizing respectability and again support the claim to the truth content of the writer’s assertions. (c.f. the way academic writing uses quotation and
citation of key research literature.) Such features are present in most academic writing, including this chapter, though hopefully in a reflexive and critical manner.

3 Implications

3.1 Classroom teaching: using the Critical Systemic Frame – pedagogical aspects

The Critical Systemic-Functional Literacy Frame is not meant to be a fixed framework, but can and should be adapted by teachers depending on the contexts, needs and interests of the learners. The choice of texts to examine also does not need to be viewed as prescriptive – it can equally well be used on a whole range of texts and genres, embracing a range of discourse types. Prior to the actual textual analysis, I feel it is useful to engage and orient learners with a series of macro-questions, aimed at fostering a critical outlook towards text in general. The following questions represent my suggestions for orientation purposes, but alternatives could be used depending upon the context, needs and interests of the learners. This list of orientation questions, therefore, needs to be viewed as an initial step in the critical orientation to, and consideration of, texts. The list could be supplemented, edited or adapted, contingent upon the texts utilized, and the pedagogic context in which the Frame is employed. The questions presented are not intended to indicate any particular order of priority:

- Is this a typical text of its type?
- Who will read it?
- Will everyone understand this text in the same way?
- Why was it produced?
- What other ways could it have been written?
- What is missing from this text?
- How does this text reflect the wider society?
- What could we do about this text if we disagree with it?

After these questions have been addressed, a more detailed analysis of the text along the themes suggested in the Frame could be employed.

This chapter advocates the critical engagement with texts, therefore also entails a critical engagement with the contexts of that text’s production and reception, its audience and its purpose, as well possibilities for interpretation. The research also suggests an orientation to working with learners to demonstrate that ideologies are represented through contexts of cultures and these contexts of cultures are construed through registers, themselves ultimately realized by particular choices in language. These ideologies themselves can therefore be unmasked by acts of analysis moving from the lexico-grammatical, through register and genre back to the ideologies that underpin the choices made at linguistic and extra-linguistic levels. Language analysis is then, by its nature, social, political and cultural analysis.
The learners are central to pedagogy in this context. My concern is not that they should mirror my, or other educators’, political stances and beliefs. What this approach advocates is open, enquiring stances, a criticality of thought and an awareness of social, political and cultural implications and responsibility for their actions. The pedagogical approach aims at providing pedagogical conditions in which they can become social agents able to take issue with, challenge and understand mechanisms of governance, and be aware of how these are mediated within society through discourse. The aim is self-sustaining in that they can then challenge the pedagogy of their own development, albeit in relation to others, and so move beyond instrumentality towards criticality.

3.2 Curriculum and teacher education recommendations

The value of a Critical Systemic-Functional Literacy Frame as an aid to personal deconstruction and ‘uncloaking’ of texts and discourse as a reflective and reflexive act lies in its potential to enhance teachers’ abilities to become more aware and, through interaction with others, develop their own notions of curriculum, so becoming more autonomous professionals. The challenge for education then is to create spaces and opportunities for reflection, that allow a continual interplay between thought and action, involving a commitment to achieving social justice through transformatory processes.

The understanding of language advocated in this chapter is one that doesn’t promote a language awareness that leads to ‘proper’ or ‘correct’ language use in the way that many proponents of a tradition, prescriptive, standard view of language promote. A clear example of such a stance is the rejection of the LINC (Language in the National Curriculum) project, by the UK Ministry of Education, because of the project’s emphasis on language in its socio-cultural context, as one variety among many. The ministry’s view was that this did not fit with the government’s view of equating ‘standard’ forms of language with ideological conceptions of discipline, patriotism and law-abiding behaviour (Carter 1992). This chapter advocates an understanding of language, and its inseparable interconnection with society, as a tool for promoting critical thought and decision-making.

The first steps towards my development of a Critical Systemic Functional Literacy Frame have been enhanced by collaborative classroom analysis and discussion with learner–teachers during my work with groups of PGCE English students on Initial Teacher Education courses in the UK, and groups of M.Ed. students both in the UK and in Dubai, Hong Kong and Singapore, as well as work with groups of teachers and teacher educators in Singapore and Spain. The Frame can, and has, been used, therefore as a tool through which teachers can critically reflect upon textual practices within their own areas of education. It has proved a valuable deconstructive tool in my own teaching and research.
3.3 Policy recommendations: the Frame in UK Secondary Education: English and Citizenship

Arguably, one of the best contemporary opportunities in the UK secondary context for exploiting the potential of a Critical Systemic-Functional Literacy Frame has arisen through the incorporation of notions of Citizenship within the National Curriculum.

The notion of citizenship education in the UK has a long history with some commentators (Lawton 2000) tracing it back to the nineteenth century, though a very different notion of citizenship was held then, subsuming such notions as patriotism, nationalism, colonialism and even racism. The most recent incarnation of Citizenship within UK education was initiated with the ‘Education for Citizenship’ report (QCA 1998). The proposal to introduce such a citizenship element into the curriculum was viewed as a response to disaffection, alienation, ‘delinquency’ and cynicism regarding politicians, resulting in low political engagement of young people as evidenced by the fact that in the 2001 election, there was a turnout of only 30 per cent of young people between 18 and 25. The Crick Report advocated ‘no less than a change in political culture…’ encouraging within young people ‘critical capacities to weigh evidence before speaking and acting… and to make them individually confident in finding new forms of involvement and acting among themselves.’ (QCA 1998: 1).

The Crick Report (QCA 1998) divided its conception of Citizenship into three component parts:

- Social and Moral Responsibility, covering ‘social virtues’ and individual responsibilities;
- Community Involvement, encouraging active participation in the community to revitalize civic networks, and;
- Political Literacy, defined as promoting effective participation in public life and the public sphere.

From a critical perspective, such a citizenship agenda could be seen a playing the role of reinforcement of the status quo in terms of the dominant values, dispositions and cultural capital of a society, but does offer the potential for a resistant space at the same time. I would contend that the introduction of a notion of Citizenship Education into the National Curriculum offers such a space and the introduction of the Critical Systemic Functional Literacy Frame, either in single subject areas, or in a cross-curricular mode, would encourage a wider engagement with critical rather than prescriptive perspectives.

The challenge evoked in this chapter is to make a space for the engagement with policy and policy-makers, whilst avoiding appropriation by the mechanisms and constructions of policy. This involves creating at the same time spaces for engagement and resistance. For me, this can be achieved at a local level by teachers. Rather than either simply following curricular imperatives, or refusing to be bound by them in totality, teachers need to seek opportunities to change and develop policy from
within. I would contend that the recent initiative around notions of Citizenship within the National Curriculum context offers such an opportunity and the Critical Systemic-Functional Literacy Frame a mechanism for critically investigating and challenging the language of policy statements, and the substance and ideology inscribed by this language. An opportunity to take advantage of openings within policy and curricular prescriptions to implement aspects of critical orientations to pedagogy might involve efforts to deconstruct the notion of Citizenship, itself not an unproblematic concept. Does this construct a picture of a homogenized group of citizens or provide an opportunity for differing and disparate voices to emerge? In what ways can individuals challenge notions of Citizenship so that they represent the latter rather than the former? And how do these challenges allow individuals to critically engage with the dilemma of the construction of a dichotomy between structure and individual agency? In Whitty’s words, the challenge is to:

...reinscribe in discourse the notion of collectivism as distinct from either atomised consumers or homogenised citizens. That collectivism is one that recognises commonality and difference... (Whitty 1998 in Torres 1998: 25)

4 Final thoughts

This chapter has sought to introduce a practical pedagogic device for the deconstruction of text in secondary classrooms. It has also sought to locate such a device within a particular educational policy context. It is hoped readers will be able to translate such a policy context to their own situations and reflect on ways in which the Critical Systemic Frame might be of use and value within their own classroom contexts.

References


1 Introduction

Most studies of adolescent literacy focus on the students’ ability to construct a coherent text that is ideationally sound. In this chapter we will explore instead how the student uses language to do the interpersonal work of managing social relationships and establishing an authorial identity in the written mode.

Adolescence is a time when learners are coming to grips with the subtleties of expressing feelings and opinions, of moderating their views, and of seeing beyond themselves to countenance other perspectives. Appraisal Theory provides us with the tools to probe how students respond to these interpersonal demands in increasingly mature ways.

In this chapter, we will look at four texts indicative of different stages of development in students’ academic writing. The first three are from the early, middle and later years of secondary school. A fourth text, from the first year of tertiary education, has been included to provide an indication of where students still need to develop interpersonally when writing for an academic audience.

All texts are from the subject History to ensure a consistency in terms of field. And within History, a particular area of study – Nazi Germany – has been focused on. This was chosen as it is a topic that generally provokes strong feelings, providing fertile ground for the observation of students’ attempts to use interpersonal linguistic resources.

The chapter proceeds in three stages: a reminder of the main systems of APPRAISAL, an outline of each text accompanied by an analysis of key APPRAISAL features, and a commentary on the students’ attempts to meet the increasing interpersonal challenges of academic writing.
2 The APPRAISAL system

The term APPRAISAL refers to a system of interpersonal meanings related to the negotiation of social relationships (Martin 2000; Martin and Rose 2003; Martin and White 2005). Appraisal theory divides these meanings into three semantic domains: Attitude, Graduation and Engagement.

2.1 Attitude

The system of ATTITUDE (Figure 7.1) deals with how we express emotion (‘affect’), how we evaluate things (‘appreciation’) and how we assess behaviour (‘judgement’). Attitudes can be positive or negative and can generally be seen as a cline (terrible > bad > so-so > good > terrific).

AFFECT involves the expression of feelings. They might be the feelings of the speaker/writer or the feelings attributed to another. These are generally realized as adjectives (the grumpy bear; Ben was ecstatic) but can also be realized as verbs (they feared the dark), adverbs (they danced merrily) or nominalizations (her happiness).

APPRECIATION is concerned with how we assess the value of things. These things can be physical objects such as paintings and movies, or abstract phenomena such as ideas and relationships. We can evaluate something in terms of its compositional qualities (a well-designed apartment, an elegant performance, a complex novel), its social value (an innovative approach, an irrelevant issue) or the reaction it provokes (a boring lecture, an appealing thought).

JUDGEMENT relates to our evaluation of behaviour or character. Our judgements may be concerned with admiration or criticism of the personal qualities that someone displays. We might, for example, judge someone in terms of whether they are special or unusual, or whether they have a particular ability, or whether they display a degree of determination and resolve. On the other hand, we might make judgements on moral grounds about someone’s truthfulness or on legal and ethical grounds about the way they conform to social norms.

Figure 7.1 The ATTITUDE System (Martin and White 2005)
2.2 Graduation

The GRADUATION (Figure 7.2) system allows us to adjust or finetune our emotions and opinions.

The strength of attitudes can be heightened or weakened through the system of FORCE. This can be achieved through intensification of the attitude (such a fool, extremely attractive) or through quantification (e.g. number: heaps of troubles; amount: so much distress; extent: long-lasting hostility).

Similarly, we can use the system of FOCUS to either sharpen an attitude (it was exactly what I wanted) or to soften an attitude (it was sort of nice).

![diagram]

**Figure 7.2** The GRADUATION System (Martin and White 2005)

2.3 Engagement

The system of ENGAGEMENT (Figure 7.3) encompasses the linguistic resources for aligning the listener/reader with the value positions of the speaker/writer. In particular, it deals with the extent to which the authorial voice engages with alternative points of view, opinions and value judgements (Martin and White 2005).

Utterances can be ‘monoglossic’ (single-voiced) where there is no overt recognition of other voices and the proposition is regarded as taken for granted. These are referred to as ‘bare assertions’, e.g.:

Hitler was a ruthless dictator.

Or they can be ‘heteroglossic’ (multi-voiced) where different possibilities and positions are acknowledged. This acknowledgement can function to close down dialogue by:

- rejecting another position (‘disclaim’)  
  *It isn’t the end of the world.*

- highly endorsing a position to the extent that other possibilities are suppressed (‘proclaim’)

...
or it can expand dialogic potential by:

- being open to a range of possibilities (‘entertain’)

  perhaps, it could be, a possibility, it seems, I believe

- explicitly recognizing other voices (‘attribute’) – referred to as ‘extra-vocalization’

  according to Brown; Smith states; (Jones 2004); it is claimed

![Figure 7.3 The ENGAGEMENT System (Martin and White 2005)](image)

Resources from the three APPRAISAL systems cluster together to construe the ‘rhetorical voice’ of a text (Iedema et al. 1994; Martin and White 2005). Different clusters tend to correlate with different genres. In the field of History, Coffin (2002) has identified three genre ‘families’:

- the recording genres (autobiographical recount, biographical recount, historical recount and historical account);
- the explaining genres (factorial explanations and consequential explanations);
- the arguing genres (exposition, discussion, challenge).

Each genre is said to typically ally itself with a distinctive rhetorical voice. Autobiography, for example, will generally involve expression of the emotions felt by the author in response to life events, biography will entail value judgements of personal qualities, while historical recounts will more likely evaluate the significance of events. In explanations we might expect some assessment of the importance of the causes or outcomes of an event. And in arguments we find Appraisal resources being used for persuading and rebutting.

Let’s examine the sequence of student texts in terms of their use of the various Appraisal resources and their development of particular rhetorical voices.
3 Early Secondary: Text A

The following text is typical of a well-established activity in early secondary history classrooms – the empathetic task. Empathy is seen by teachers of history as ‘the ability to see and understand events from the point of view of participants’. The success of an empathetic activity lies in the ability to imaginatively construct a plausible, convincing scenario demonstrating such a familiarity with the historical setting that the writer is able to recreate not only the material features of the era but the lived experience – the ‘ideas, beliefs and values appropriate to the historical context and the time period/era’.

In this case, students have been immersed in details of the everyday life of Jews under the Nazi regime. They have then been asked to imaginatively reconstruct the experience by taking on the persona of one of the participants.

Text A

April 3, 1933
Dear Diary,
Hi! It’s me Rivka. Today was one of the worst days of my life!!!!!!!!!!! Papa’s store got boycotted. No one is buying By (sic) him. He said if business doesn’t go up we’ll lose the store. We’ve had the store for ten years. I think it is unfair that just because we’re Jewish we have to lose our family store. My great-great-grandfather started that store. I’m so scared!!!!!!!!!!! Then, a few days ago I found out they opened up some kind of camp called Dachua (sic). I don’t know whether to be happy or sad. I don’t know what to think anymore.
Sincerely yours,
Rivka

3.1 Attitude

Following the curiously chatty greeting (Hi! It’s me Rivka.), the dominant tone of the text is established in the sentence:

Today was one of the worst days of my life!!!!!!!!!!!

This evaluation (negative Appreciation) sets the reader up to interpret the subsequent text in a particular way.

Given the nature of the task, with its emphasis on trauma in times of persecution, the dominant ATTITUDE resource drawn upon here is inevitably that of Affect. The writer is expressing an inner emotional state:

I’m so scared!!!!!!!!!!!

Apart from such direct, ‘inscribed’ expressions of emotion, there are statements which, out of context, could appear devoid of affect (e.g. We’ve had the store for ten years.) and yet, when read in the context of the preceding statement (... we’ll lose the store), this otherwise innocuous observation reinforces the feeling of loss. Even though it contains no explicit emotion, it is said to ‘evoke’ affect when read in the light of the surrounding text.
Another indirect way of expressing affect is to describe someone’s behaviour as indicative of an emotional state. Rather than stating, for example, ‘I felt bewildered’, the writer implies this:

*I don’t know whether to be happy or sad. I don’t know what to think anymore.*

Similarly, the writer uses affectively charged words such as ‘Dachau’ which serve to trigger an emotional response from those who are familiar with the term.

Mixed with the feelings of fear, loss and confusion, the writer also evaluates the propriety of the behaviour of the Nazis through the resources of JUDGEMENT:

*I think it is unfair that just because we’re Jewish we have to lose our family store.*

Certain implicit judgements about people’s behaviour can only be understood retrospectively. The statements that:

*Papa’s store got boycotted.*
*No one is buying By him.*

can only be fully appreciated as judgements of the effects of the Nazi regime when one later reads that ‘just because we are Jewish we have to lose our family store’.

3.2 Graduation

The attitudinal force is amplified through the use of a variety of devices drawn from the system of GRADUATION.

Amplification of a quality can be achieved through the use of a pre-modifying intensifier:

*I’m so scared!!!!!!!!!!*

or through the choice of a graded lexical item, in this case a superlative:

*Today was one of the worst days of my life!!!!!!!!!!*

Of course the multiple exclamation marks also function to boost the level of intensity.

In addition to intensification, Force can also be achieved through quantification, either in terms of number:

*No one is buying By him.*

or through extent (e.g. time):

*We’ve had the store for ten years.*
*My great-great-great-great grandfather started that store.*

These choices heighten the feeling of loss.

Graduation is also implicated in the sharpening or blurring of boundaries, referred to as Focus. In this text, for instance, the writer sharpens the focus with the use of ‘just’:

*adolescent academic writing Derewianka 147*
and blurs it with the reference to:

some kind of camp called Dachua.

3.3 Engagement

In an empathetic task, we need to distinguish between the writer of the text and the character created by the writer. In Text A, the writer uses the character of Rivka to project the emotions, evaluations and opinions that were experienced by the Jewish people under the Nazi regime.

In seeking to align the reader with plight of the Jews, the writer uses the device of ‘Rivka’ to distance him/herself from the expression of feelings, judgements and opinions. The views expressed do not represent the writer’s commitment to the truth value of a proposition, but the character’s purported commitment.

In terms of opening up the text to other voices and points of view, in a sense, the whole text can be seen as providing a space for a member of the historical era in question to ‘have a voice’. When the writer uses the resource of projection from the system of ENGAGEMENT, as in I think it is unfair, it is Rivka who is supposedly the source of these words. In this case, the projecting clause, I think, signals that the judgemental proposition, it is unfair, is grounded in Rivka’s ‘individual, contingent subjecthood and thereby representing this value position as but one among a potential diversity of viewpoints’ (White 2003: 264).

3.4 Rhetorical voice

Appraisal theory is concerned with ‘how an evaluative strategy unfolds across a text’ (Coffin 2003: 243). Martin and Rose (2003: 54) refer to this as the prosody of the text – how the pattern of choices ‘forms a prosody of attitude running through the text that swells and diminishes, in the manner of musical prosody’, constructing the voice or stance of the writer.

Text A could be thought of as a type of autobiographical genre (in this case, pseudo-autobiographical), typically associated with one of the minor voices in historical discourse – the ‘emoter voice’. Coffin (2002) characterizes the emoter voice as favouring ‘high levels of affect which are largely used to express an emotional response to major life events’. As we have seen above, Text A is primarily seeking to align the reader with Rivka’s plight by playing on feelings of loss, confusion and insecurity (e.g. I’m so scared!!!!!!!!!!). The writer deploys high levels of graduation to augment the feelings in an attempt to heighten the reader’s sympathetic response (e.g. Today was one of the worst days of my life!!!!!!!!!!!!). Apart from the intrusion of Papa (He said if business doesn’t go up we’ll lose the store.), the text is single voiced, located very much within the ‘private’ sphere of the first person
(e.g. *I found out, I don’t know, my life*), with an emphasis on the personal rather than the public.

4 Mid-Secondary: Text B

The following text – Action-Bound – was written by a mid-secondary student in response to the question:

a) Analyse why it is so vital that the remembrance, history and lessons of the Holocaust be passed to a new generation; and

b) Suggest what they, as students, can do to combat and prevent prejudice, discrimination and violence in our world today.

The essay was a prize-winning text, submitted to The Holocaust Remembrance Project, a national essay contest for high school students that ‘recognizes the moral imperative of teaching young people about this watershed event and the central importance of passing on to future generations a profound understanding of the consequences of the Holocaust and a sense of responsibility to the human community’.

It is designed to promote the study of the Holocaust, encouraging students ‘to think responsibly, be aware of world conditions that undermine human dignity, and make decisions that promote the respect and value inherent in every person’. Students are urged to use the task as a means to personally react to the messages of the Holocaust.

The essay question and the expectations of the contest have resulted in the writing of a hortatory exposition, where the writer seeks to persuade the reader to take action in relation to an issue.

4.1 Attitude

The essay starts by painting a horrific scene of mutilation and mayhem:

**Text B** (extract)

*The room is dim in the blood-red light of the setting sun. Children are cowering, wailing, in the corners. Their parents stand beside a table, begging to the warped delight of the uniformed-men who broke down the door. The leader of the band grins sadistically, forcing into the man’s hand a long, sharp knife from a dusty daypack. He orders the man to cut his wife open. His wife begs between suppressed sobs that the soldiers spare her children if her husband does as they ask. The leader grins and nods. The husband pauses with awful anticipation as he looks into his children’s eyes; should he refuse, he knows he has sealed their fate as well. He contemplates the appalling situation; how can he murder his wife . . . in front of his children’s innocent eyes? His wife pleads – her voice obscured by the men’s laughter – pleading for him to let the knife fall before the men change their minds. After one last look at his wife, he lets the heavy blade drop. The men laugh and send a shot into her belly, leaving her to die slowly. Only a block away, another squad discovers five thousand villagers huddled in a small Catholic church. They cast grenade after grenade into the little chapel, shooting all who attempt to flee until there is no movement. And with one last, fiery glance to the mountains on the horizon, the sun sets on the bloodstained earth.*

The function of this first paragraph is to engage the reader on an emotional level. It is difficult to analyse discrete elements of the paragraph as the whole is saturated with intensified affect and judgement.

As with Text A, here the primary emphasis is on raw feelings, drawing on resources of negative Affect to depict the terror experienced by the victims:

*Children are cowering, wailing, in the corners between suppressed sobs.*

Much of the Affect is evoked through the description of the setting and people’s actions and thoughts:

- *The room is dim in the blood-red light of the setting sun*
- *The husband pauses with awful anticipation*
  *how can he murder his wife . . . in front of his children’s innocent eyes?*

Condemnation of the perpetrators is suggested by tokens of Judgement: Social sanction: Propriety:

- *... to the warped delight of the uniformed-men who broke down the door. The leader of the band grins sadistically, forcing into the man’s hand a long, sharp knife from a dusty daypack.*
- *The leader grins and nods. her voice obscured by the men’s laughter*
- *The men laugh and send a shot into her belly, leaving her to die slowly.*

After revealing that the scene described is not a Holocaust tragedy but a contemporary Rwandan atrocity, the writer then turns from denunciation of the wrong-doers to criticism of society. He/she laments that humanity does not learn from history, warning against turning a blind eye to such acts of violence and urging that the wounds of the Holocaust must never heal. In condemning present-day and past societies, Judgement: Social sanction: Propriety (with high degree of Force: intensification) is used to express indignation that such events can still happen:

*How could humanity allow such events to occur after the tragic events of the Holocaust? The answer is simple: while genocide may not directly be our individual fault, we condone these horrors by forgetting the terrible memory of the Holocaust’s.*
*The act of standing by and allowing such atrocities is almost as foul as perpetrating the crimes themselves.*
*While the bulk of humanity forced the world’s problems out of sight and out of mind, these atrocities grew to create a more dreadful reality for us when we finally awoke.*

The multiple metaphorical expressions in this section also function to provoke an affectual response:

- *these wounds in our psyches*
- *these heart-sores*

In the subsequent paragraphs, the writer encourages action at the individual, community and global levels. In contrast with the previous negative judgement of the perpetrators of violence and of those who stand by, positive judgements are attached to potential role models, particularly in terms of their willingness to forgive:
The ten Boom sisters – despite their abuses at Ravensbruck – provide an example for releasing hatred from our hearts. Betsy ten Boom’s boundless love extended so far as to pray for forgiveness for Nazi guards as they whipped her fellow prisoners. Corrie’s character was similarly tested years after her release: she spotted a prior guard in the charitable shelter she established and, despite her intense emotions, she found it within herself to shake his hand. Indeed, forgiveness freely given is the only way to end such flagitiousness in the future.

Pacific Rakanwa, a survivor from the Rwandan massacres, embodied the forgiveness necessary by revealing, “We know those who killed here, but we forgive them because they have confessed to the killings. We even live with some of them here. We know them, but we forgive them.”

In each case, the admiration is enhanced through the use of concession:

- despite their abuses at Ravensbruck
- despite her intense emotions
- We know them, but we forgive them.

Through the resources of Judgement, the writer is seeking to establish communal assumptions around shared values.

4.2 Graduation

The terror and condemnation in the first paragraph is heightened by the choice of lexical items that embody high values of Graduation: Force. In terms of processes, the victims cower, wail, beg, plead and huddle, while the villains grin, order and murder. High force epithets such as appalling, innocent and blood-red and nominal choices such as atrocities, evils and genocide are designed to heighten the reader’s involvement.

In the following paragraphs the interplay of condemnation and admiration is boosted through the use of high degrees of intensification:

<table>
<thead>
<tr>
<th>Negative attitude + intensification</th>
<th>Positive attitude + intensification</th>
</tr>
</thead>
<tbody>
<tr>
<td>demonic</td>
<td>heroic</td>
</tr>
<tr>
<td>hatred</td>
<td>boundless love</td>
</tr>
<tr>
<td>abuses; flatigiousness</td>
<td>forgiveness freely given</td>
</tr>
<tr>
<td>prejudice</td>
<td>struggle against any form of hatred</td>
</tr>
<tr>
<td>great campaigns of genocide in</td>
<td>battling these forces of darkness</td>
</tr>
<tr>
<td>foreign lands</td>
<td>destroy the seeds of mass</td>
</tr>
<tr>
<td>evil; violence; disturbing; horrifying</td>
<td></td>
</tr>
<tr>
<td></td>
<td>disharmony and genocide;</td>
</tr>
<tr>
<td></td>
<td>eliminating the root of Holocaustic</td>
</tr>
<tr>
<td></td>
<td>atrocities</td>
</tr>
</tbody>
</table>
The writer also deploys Graduation: Force: Quantification as exemplified in the following extract:

*Only a block away, another squad discovers five thousand villagers huddled in a small Catholic church. They cast grenade after grenade into the little chapel, shooting all who attempt to flee until there is no movement.*

The fact that it is ‘only a block away’ (Extent: Space) gives the impression of several atrocities occurring in close proximity. The contrast between the vast numbers – *five thousand villagers* (Number) – and the *small Catholic church / the little chapel* (Mass) emphasizes the ease of the slaughter. The repetition of *grenade after grenade* (Number) hints at the relentless overkill. *All who attempt to flee* (Number) are shot *until there is no movement* (Extent: time). Although at first glance these might appear to be simply experiential choices, they are loaded with interpersonal meaning as the writer seeks to push the extremities in impressing on the reader the magnitude of the event.

4.3 Engagement

The writer draws on a variety of Engagement resources in an attempt to involve and position the reader.

Following the opening description of the brutal slaying, the reader’s assumptions are disrupted by the use of Engagement: Counter-expectancy, the writer pointing out that the incident is not a holocaust atrocity from the past but an example of genocide in contemporary Rwanda:

*One may shrug and attribute the story above to the many atrocities of the Holocaust; however, this true story did not occur fifty years ago – it took place in Rwanda in the summer of 1994.*

Such a ploy can be seen as a rehearsal for more subtle uses of endorsement and countering in later years.

In exhorting society not to turn a blind eye, the writer interacts directly with the reader, freely using high modality and first person plural pronouns:

*We cannot blind ourselves to truth
The shock and awe that tear the heart when one hears stories of the Holocaust must never heal it is up to us to ensure this happens.

We must learn from such abominable acts
we must fight against such evils
we must value human life
we must never forget what once happened in Germany and ended in Auschwitz
our remembrance must include fighting against current campaigns of genocide in foreign lands
we can never sit idly by
the dream of nine-year-old Rwandan Tutsi survivor, Hachi Mana, must become our reality*

In one instance, the modality is metaphorized:

*it is imperative that mankind understand*
There are two examples of extravocalization, first where the words of the Rwandan survivor are used to reinforce the writer’s plea for forgiveness, and secondly where Father ten Boom’s words are used to underscore the sentiments of the writer: ‘You say we could lose our lives for this child. I would consider that the greatest honor that could come to my family’.

4.4 Rhetorical voice

We could assign to this text the voice of ‘social activist’, even though such a category is not identified in Coffin’s taxonomy. The writer of Text B strives for a high degree of dialogic interaction (with around 30 instances of we to engender mutual accountability). The writer pulls out all the attitudinal stops – emotionally wrenching Affect to appeal to the reader’s heart along with strongly negative Judgement of the Nazis and equally strong positive Judgement of heroic figures to reinforce alignment with the presumed moral stance of the reader. Unlike Text A, however, this text deploys these attitudinal resources in the service of argumentation: to mount the case that knowledge of history is one of the best defences against repeating past mistakes. It then goes even further – not content with persuading the reader to accept an abstract proposition, the writer exhorts the reader to take action.

5 Late Secondary: Text C

This essay is a response written under examination conditions to the question:

To what extent were individuals responsible for the rise of a dictator you have studied?

The text sits at the intersection of an historical explanation, identifying specific causes for the rise of the dictator in question, and an argument with regard to the extent of the causal responsibility.

The essay opens with a strong thesis statement, arguing that Hitler’s rise to power was due to a significant extent to individuals: to Hitler himself, to von Papen and to Hindenburg. Social factors such as the Depression and the weakness of the political system were identified as being influential to a lesser extent.

Text C (extract)

To a significant extent, individuals can be considered responsible for the rise of Hitler to power on the 31st of January, 1933. Hitler himself, the charismatic leader of the Nazi Party, as well as creator of Nazi policy, played a key role in his own rise to power. However, other individuals in government, such as Hindenburg and von Papen were influential in Hitler’s rise. To a small extent, other factors also enabled Hitler to rise to power such as the Depression and the weakness of the political system. Nevertheless to a significant extent, individuals can be held responsible for the rise of Adolf Hitler to power.
5.1 Attitude

The primary attitudinal resource drawn on is that of JUDGEMENT, as the writer assesses the contributions made by the various parties to Hitler’s rise to power. Hitler himself is appraised positively for the role he plays:

- Hitler himself, the charismatic leader of the Nazi Party, as well as creator of Nazi policy, played a key role in his own rise to power.

He is recognized for:

- his strong leadership of the Nazi Party
- a major reorganisation of the party
- his speaking ability, and
- the way he was portrayed in the press and Nazi propaganda.

The writer is astute in responding to the requirements of the essay question – judging Hitler in terms of his strategic qualities rather than on moral grounds. Hitler is represented as a clever tactician, which was crucial to his ascension to power:

- He made sure that he was seen as a victim of the Treaty of Versailles, just like his audience. Yet, Hitler was also careful to portray himself as a World War One hero who had faced the enemy on the Western Front and was equally strong enough to face the political front of Germany.

Both Hess and Hitler are seen as contributing through positive actions – in particular their founding of the Nazi Party ideology, an essential part of their rise to power. Again, they are portrayed in a positive light in terms of their capability:

- Hitler made sure nationalism was a main feature of this policy.
- Hitler took advantage of these circumstances.
- He presented his party as a party which, if elected, would restore Germany’s pride and empire.
- Hitler was careful to tie in his propaganda to describe his aims as similar to those of Imperial Germany.
- he designed the swastika flag with the same colours as that of the pre-1914 German Imperial Flag.
- Hitler was extremely successful in attracting votes
- Hitler took full advantage of the German people’s jealousy of the Jew’s wealth and hatred of the ‘red menace’
- Hitler was also willing to change his party’s policies in response to public sentiment
- Hitler completely changed his policy on industrialisation when it became evident that it would result in less financial and political support from the important industrialist sector of society

The major resource drawn on here is Attitude: Judgement: Social Esteem: Capacity, construing Hitler as an adroit politician, the architect of his own rise to power. Apart from the explicit attribute successful (Hitler was extremely successful in attracting votes), Hitler’s capacity is evoked through tokens of behaviour.

Other individuals are acknowledged as playing a key role in Hitler’s rise to power – not because of their positive qualities but because of their
failings. Chancellor Mueller and General von Papen are judged negatively as providing the conditions for Hitler’s rise:

- *His failure* to hold together the weak centre coalition of the Reichstag
- *Who failed* to be a strong decisive leader

Hindenburg is also chastised for his weakness:

- *Hindenburg failed to realise* that he could not control Hitler
- *Hindenburg failed to see*, that by 1932, the Nazi Party was decreasing in popularity

### 5.2 Graduation

The writer’s evaluation of Hitler’s positive capacity is boosted by the use of high value ‘up-toners’ such as *extremely successful*, *completely changed his policy* and *took full advantage*. His portrayal of the negative contribution of other individuals is strengthened by his use of both Intensification and Quantification:

- *Germany, in the post war years was heavily reliant on loans*
- *The German economy suffered greatly*
- *Agricultural prices fell dramatically*
- *Industrial production, due to closure of many businesses, fell by 41%.*
- *Over 6 million people in Germany were out of work*
- *By 1932 the Nazi Party had become a major political force with some 13.4 million votes*
- *There was a crucial shortage of capital*

In evaluating the significance of events and actions, the resources of Graduation are integral to the argumentation. The claim that individuals were responsible *to a significant extent* lends a high degree of weightiness to the thesis and is further foregrounded by being placed in thematic position. The degree of causal responsibility for Hitler’s rise to power is revisited throughout the text. The individual *most responsible could be said to be Hindenburg*, while Mueller and von Papen were *somewhat responsible*. The final paragraph reiterates the thesis, with a return to the essay question in terms of the roles of different agents and the extent of responsibility. The writer reinforces his argument, reiterating that individuals were responsible *to a considerable extent*, while contextual factors were also acknowledged as responsible *to some extent*.

### 5.3 Engagement

The writer displays dexterity in his ability to moderate his commitment to a proposition. The statement that the individual *most responsible could be said to be Hindenburg*, for example, is softened with low modality and a passive verbal process – allowing for other possibilities to hover. Similarly, low modality and a passive mental process open up space for negotiation in claiming that Mueller and von Papen *can be considered somewhat responsible*. 
The enumeration of reasons for Hitler’s success exemplifies a further ENGAGEMENT category suggested by White (2003): JUSTIFICATION. The writer has made an evaluative claim regarding Hitler’s strategic genius which might go against the grain of the intended readership. He therefore must use convincing argumentation to persuade the reader to his claim. White contends that such formulations are dialogic because:

they construct the textual voice as engaged in persuasion and some other communicative participant (typically the immediate addressee) as being in the role of ‘persuadee’, as holding a viewpoint which is to some extent different from that of the textual voice and against which the textual voice needs to mount an argument. (White 2003: 274)

5.4 Rhetorical voice

If Text C were a factorial explanation (e.g. ‘Which factors contributed to Hitler’s rise to power’) it might have displayed what Coffin (2002) refers to as ‘interpreter voice’, where the authorial intrusion is less ‘morally charged’. However, because the students were asked to identify the extent to which individuals were responsible for Hitler’s rise to power, the writer is required to adopt a position and argue for it, in the process making judgements about moral, legal and ethical issues. In such a case, Coffin identifies ‘adjudicator voice’ as one drawing on the resources of social sanction, social esteem and valuation.

Unlike Texts A and B, in this text there is no recourse to affect. The writer relies on argumentation – a series of claims and warrants – to persuade the reader of the validity of his position. The writer avoids denouncing Hitler (Social sanction: Propriety) for his regime’s crimes against humanity. Rather, he acknowledges Hitler’s attributes in engineering his rise to power (positive Social esteem: Capacity). He also refrains from maligning Mueller, von Papen and Hindenburg on moral grounds but again judges them in terms of their ability (negative Social esteem: Capacity). Graduation resources are used not to intensify affective and moral issues, as in Texts A and B, but to add weight to the argumentation.

6 Early Tertiary: Text D

The following is an extract from a tertiary level essay on the issue of how the Holocaust in the Second World War began. It deals with the question of whether the Holocaust was the result of a deliberate plan or whether it happened in a more haphazard way. In this excerpt, we are introduced to the ‘intentionalist’ position of Breitman, weighed against the more ‘functionalist’ positions of others such as Browning.

Text D

Breitman, in his article Plans for the Final Solution, refers to the controversy about the origins of the Holocaust as the “intentionalist-functionalist” debate; that is one between those who think the Holocaust was a preconceived Nazi plan, and those who think it was improvised hastily, notably after early German victories in the Soviet Union in mid-1941.
Breitman, in contrast to Browning, is very much an ‘intentionalist’, arguing that the
‘murderous intentions’ of Hitler, Himmler and other key Nazis were well underway before the
invasion of the Soviet Union.

Whilst he admits that many of the Nazi documents on this issue are “inexact”, he suggests that
this is not because the Holocaust plan itself was uncertain, but rather because the Nazi
leadership wanted to “conceal” and “veil” its real intentions from others (p. 271).

To support his case for pre-planning, Breitman relies on two main sources of evidence: memos
from two officials in the Nazi Jewish Office at the time – Adolf Eichmann and Theodore
Dannecker; and the Nuremberg testimony of Viktor Brack, an official in the Fuhrer Chancellery.

The memos in question indicate that high-level discussion of some form of ‘final solution’ did
take place early in 1941.

Danneker’s memo in January 1941 disclosed that Hitler wanted a ‘final solution’ of the Jewish
question.

A month later, Eichmann in a meeting at the Propaganda Office announced to rival bureau-
crats that Hitler was determined to implement a ‘final evacuation’ of the Jews.

The problem however, with such evidence is that there is doubt among historians about what
these terms actually meant at the time.

‘Final solution’ and ‘final evacuation’ may have been code words for mass extermination, but
they may equally have referred to some less murderous Nazi policies.

It was known for example, that other options being considered around this time were the mass
deportations of Jews to Madagascar, and also mass sterilisation.

Breitman’s argument relies on an assumption that these terms could refer only to what later
became the Holocaust.

He states that to require ‘an unambiguous blueprint for extermination’ from the Nazi archives
is asking for an impossible standard of proof (p. 274).

But, unfortunately no such document has been uncovered by historians and so, we have to be
cautious about how we interpret Nazi intentions at the time.

6.1 Engagement

The writer’s employment of Engagement is significant in this text, so I will
discuss it first.

The striking feature of this extract in contrast with the previous texts is
the use of the ENGAGEMENT resource of projection, with several instances
in the space of a couple of paragraphs:

those who think the Holocaust was a preconceived Nazi plan . . .

those who think it was improvised hastily.

arguing that the ‘murderous intentions’ of Hitler, . . .

he admits that many of the Nazi documents . . . are “inexact” . . .

he suggests that this is not because the Holocaust plan . . .

The memos . . . indicate that high-level discussion . . .

Danneker’s memo . . . disclosed that Hitler wanted . . .

Eichmann . . . announced to rival bureaucrats that Hitler . . .

It was known for example, that other options being considered . . .

The act of projection allows for other voices to be admitted into the
discussion (extravocalization), with the writer orchestrating the interplay of
these voices. The writer is not the source of the propositions. Rather, he/she allows Breitman, through one of his journal articles, to introduce
the main protagonists: those who think the Holocaust was a preconceived Nazi plan and those who think it was improvised hastily. The tension thus established between these two camps remains immanent throughout the text. Breitman then puts the case for the intentionalist position, arguing that the “murderous intentions” of Hitler, Himmler and other key Nazis were well under way before the invasion of the Soviet Union. At this point, the writer introduces evidence from the primary sources – documents relied on by Breitman – into the discussion (The memos in question indicate that . . .). We read that Dannecker’s memo . . . disclosed that Hitler wanted a “final solution” and Eichmann . . . announced that Hitler was determined to implement a “final evacuation” of the Jews. This polyphony of voices – nominalized into the debate and the controversy – is skilfully managed by the writer in developing the argument.

The writer’s use of scare quotes is particularly interesting. They are used with a quoting function throughout the text to create distance from the assertions – ensuring that any instances of judgement (e.g. ‘murderous intentions’) are attributed elsewhere. When quoting Dannecker and Eichmann, however, the scare quotes perform an additional function of raising doubt, calling into question the meaning of ‘final solution’ and ‘final evacuation’ – a strategy integral to the argument being developed in relation to the purported meaning of the documents.

The lexical choice of verbal processes adds a degree of interpretation by the writer of the reported proposition. Breitman, for example, doesn’t simply ‘state’ but is portrayed as ‘arguing’, ‘admitting’ and ‘suggesting’, opening up the dialogic space by entertaining potential alternatives.

6.2 Graduation

The writer of the essay carefully probes the validity of Breitman’s position. The argument turns on the extent to which these documents provide clear-cut evidence or not of a plan to exterminate the Jews. In mounting such an argument, the Graduation resources of Focus (along with the Engagement resources of Entertain) are brought into play, blurring and sharpening the issue and softening the level of certainty. Breitman admits that the documents are inexact, but argues that they deliberately seek to conceal and veil its real intentions. The writer of the essay, however, makes the point that the documents refer to some form of ‘final solution’ but that there is doubt about what this term actually meant at the time – it may have been a code word or it may have referred to other options. While Breitman states that to require an unambiguous blueprint is to ask for an impossible standard of proof, the writer of the essay urges caution in the absence of such a document.

The weight of the writer’s critique of Breitman’s position is invested in a handful of Graduation resources: the fact that the documents acknowledge some form of “final solution” (Focus: Valeur: Specificity), though there is doubt as to what these terms actually meant at the time, bringing into question Breitman’s assumption that these terms could refer only (Focus: Valeur: Specificity) to what later became the Holocaust.
6.3 Attitude

The text is virtually devoid of overt Attitude, the main work being done by other resources. There is no expression of emotion. The writer makes no value judgements about people’s behaviour or character. There is, however, a critique of Breitman’s argument (Appreciation: Social valuation: Validity) inasmuch as he relies on two main sources of evidence, both of which are deemed by the writer to be problematic. Indirectly, this questions Breitman’s historiographic competence (Judgement: Capacity).

6.4 Rhetorical Voice

We might also think of this as ‘adjudicator voice’, though it is a different type of adjudication from Text C. As the term suggests, the writer of this text is acting more in the role of referee, weighing up the positions put by both sides of the debate. Whereas Text C is an exposition, with the writer accumulating evidence in support of his own stated position, Text D is a discussion, critically evaluating the positions taken by others.

The first half of the text appears to be simply stating, and even endorsing, Breitman’s position. There is a very subtle shift at the beginning of the second paragraph, however, with the aligning use of the emphatic did (Contraction: Proclaim: Concur): ‘The memos in question indicate that high-level discussions of some form of ‘final solution’ did take place’. The concurrence provides the context for a subsequent disaligning rhetorical move of countering (Contraction: Disclaim: Counter), signalled by however: The problem, however, with such evidence is that there is doubt among historians about what these terms actually meant at the time. The writer has created the conditions for finally taking a critical stance (though even here the responsibility is shared with the doubting historians). Described by Martin and White (2005) as setting up a plausible proposition and then discounting it as unsustainable, this rhetorical strategy is a key feature of adjudicator voice.

7 The development of students’ use of interpersonal resources

What can we say about the development of students’ interpersonal resources from the above texts? First, we would need to recognize that we cannot make any generalizations on the basis of these few texts. They are single instances of responses to particular tasks in a small range of pedagogical contexts. They do, nevertheless, provide insights into some of the interpersonal challenges facing students as they progress through secondary schooling.

Secondly, we would need to be cautious about claiming that they represent some sort of maturational continuum, where certain resources are seen as developing simply in response to the fact that the students are getting older or even that they have accumulated greater life experience, though these factors cannot be completely discounted. If we view language
in terms of a situated response to contextual demands, then we need to consider writing development in terms of the environmental pressures, affordances and constraints.

While ultimately we would need to consider the interplay of all three APPRAISAL systems, at this stage I will continue to discuss the contribution of each system separately to the development of strategies for negotiation of interpersonal meaning.

7.1 Evaluation strategies

One way of viewing the development of evaluation strategies is in terms of the increasing ‘institutionalization of feeling’. Martin (2000) sees AFFECT as the basic system which is recontextualized as JUDGEMENT and APPRECIATION when evaluations draw on criteria grounded in social norms rather than personal response.

In Text A, we find the direct expression of Affect realized congruently as adjectives functioning as Attributes (scared, happy, sad). While this is not unexpected in a diary entry written by a fictional character, an appeal to the emotions in this way would not be highly valued in later years. In Text B, the emotions are vivid and prolific: shock and awe, these heartsore, hatred, despise, despair.

In both these texts, Affect is deployed not as an end in itself but as a strategy to build solidarity and emotionally soften the reader for the ensuing assessment of people’s behaviour and character. Judgement in these texts is quite blatant and referenced to the writer’s assumption of shared values rather than to some external source. In Text A people’s actions are labelled ‘unfair’. In Text B the writer freely levels accusations:

we condone these horrors
such abominable acts
The act of standing by and allowing such atrocities is almost as foul as perpetrating the crimes themselves.
the bulk of humanity forced the world’s problems out of sight and out of mind
Similar thinking allowed six million Jews to die by the hand of Hitler.

With the move into upper secondary, the evaluation of behaviour is much more subdued. Whereas the Judgement in Text A and B is in terms of moral values (Social sanction: Propriety) – closer in origin to the more emotive end of the continuum – in Text C, the actions of Hitler and his associates are judged more in relation to achievements (Social esteem: Capacity), relying less on admiration or condemnation. The writer is interested in identifying the significance of actions in explaining the reasons for Hitler’s ascent to power (Appreciation: Social value: Valuation). In Text D we find no recourse to Affect and no overt Judgement. Indirectly, Breitman’s argument is appraised in terms of its rigour (Appreciation: Social value: Valuation) which could be seen as an implicit judgement of his academic capacity. Here what is being valued and judged are not historical figures and events as in Text C, but abstract
propositions and the merit of the argument. In Hood’s (2004a: 173) terms, this could be seen as a shift from evaluation of the field of domain to evaluation of the field of research.

We might see the movement from the affective exhortations of Texts A and B grounded in local experience and individual characters to the more detached reasoning of Texts C and D as reflecting Bernstein’s (1999) distinction between the horizontal discourses which privilege the localized and subjective and the vertical discourses which privilege generalization, theorization and a more integrated mode of knowledge construction (i.e. privileging ‘knowledge’ over the ‘knower’).

The attitudinal shift in these texts also echoes what Painter (2003) observed in the early ontogenesis of Attitude. Her data illustrates a progression from the direct experience of feelings to the semioticization of feelings in words, construing one’s own feelings and later the feelings of others. In learning to pass judgements, the child recognizes that it is less risky to evoke (for example through the use of Appreciation) than to explicitly judge:

> the middle-class child quickly learns that substituting APPRECIATION for JUDGMENT (or AFFECT) is a useful rhetorical strategy for distancing self-blame and constructing appraisals as ‘factual’ and therefore less open to challenge or dismissal. (Painter 2003: 207)

Similarly, in the sphere of adolescent academic writing, we might discern a developmental trend in terms of the movement from the direct, congruent expression of Attitude to the evocation of Attitude through the use of experiential tokens to trigger evaluative readings, placing a greater onus on the reader to interpret the intended meanings.

As they progress through secondary school, students encounter the expectation to be ‘objectively persuasive’ (Hood 2004a). In order to meet this challenge, they need to be able to evoke rather than inscribe and to rely more heavily on Appreciation (in particular, valuation) rather than the more personal Affect and Judgement. This is not to suggest that we should discourage passion in the young, but that we should ensure that they are able to make informed decisions about discoursal choices.

### 7.2 Finetuning strategies

In Texts A and B we find maximal values of Graduation encoded in intensifying premodifiers (so scared, so deeply, boundless love) and highly graded lexical items (atrocities, hatred, flatigiousness) as well as expressions such as in any shape or form and so long as we have air to breathe. The volume is turned up so loud that the writer’s credibility is called into question.

In Text B, in addition to the use of Intensification, we also see the resources of Quantification (number, mass and extent in time and space) being deployed to impress upon the reader the scale of the atrocities.
this case, the phenomena being graded are not explicitly attitudinal but as Hood (2004a) argues, the very act of quantification often implies some degree of Appreciation or Judgement, depending on whether the surrounding text encourages a more interpersonal reading.

In Texts C and D, both Force and Focus are used strategically to further the argumentation. In Text D in particular the success of the argument rests on the degree of specificity and the sharpening and blurring of boundaries. In upper secondary school, students are increasingly asked to adopt a critical stance toward both the subject matter and those engaged in constructing the discourse. Hood (2004b) suggests that it can be naive to openly criticize authorities in the field, hence the preferred strategy of using the subtleties of graduation to align the reader.

7.3 Dialogic strategies

White (2001) describes dialogistic engagement in terms of ‘utterances in which the authorial voice is represented as engaging with dialogistically alternative or external positions. The current utterance is represented as taking up, responding to, acknowledging, endorsing, rejecting, discounting, challenging or anticipating some prior or potential utterance’. In secondary education, such dialogic strategies are key to students’ effective participation in the discourses of the various subject areas. We might think about development in this area in terms of movement from a relatively undialogized writer position which sees the field as unproblematic and assumes solidarity with the reader to a writer position which is more explicitly open to other voices and possibilities and which recognizes the need to negotiate with these voices.

Text A is largely monoglossic. It attempts to convince primarily through ‘bare assertions’ emanating from the writer/character. Even though we can infer that the writer has engaged with other texts in developing knowledge about the Jewish experience as the basis for the empathetic diary entry, the sources remain unacknowledged. The writer takes for granted solidarity with a reader – most likely the teacher – who is assumed to value the personal and emotive above the critical and resistant.

In Text B we can detect a higher level of awareness of participating in a discourse community. The writer is working harder at establishing a convincing authorial persona and managing the relationship with the reader – even though the attempts are at this stage somewhat over-reaching, with the heavy reliance on the use of high modality (obligation) and the first person plural.

The writer of Text C appears to be much more conscious of the need to negotiate meanings with the reader (e.g. through modalization and the use of the passive). Although the bulk of the utterances are monoglossic, they are no longer sourced to individual experience (e.g. Papa’s store got boycotted) but carry evidence of having widely consulted other texts in the field (e.g. Industrial production, due to closure of many businesses, fell by 41%).
These implicit intertextual references are marshalled by the writer to add weight to the line of argumentation.

Text D reveals an awareness of the problematic, constructed and inter-subjective nature of meaning-making. Other voices are explicitly drawn into the discussion, interpreted, analysed, critiqued and played off against each other. The writer engages not so much with a specific reader but with a more general readership – and a readership with which he/she can’t necessarily assume solidarity. He/she skilfully moves between expansive resources to open up possibilities and contractive resources to lead the reader towards an acceptance of his/her claim.

8 Conclusion

Painter locates the interpersonal at the very heart of language learning and development:

Learning one’s mother tongue is inescapably a process of learning to perceive experience in the evaluative terms relevant to the learner’s meaning group (2003: 201).

Even in the adolescent years, learners are extending their interpersonal repertoires as they tune into the shared value system and institutionalized norms of secondary schooling. The extent to which students are able to meet the interpersonal expectations of high school will depend to a large extent on the ‘possibilities for selfhood’ (Ivanić 1998) afforded by the educational context. If students are constrained in terms of the discourses to which they have access, their interpersonal growth will be stunted. By identifying the appraisal resources implicated in the development of a critical literacy, we can gain an insight into the kinds of discoursal spaces that need to be made available within the curriculum.

Notes

1 The texts used here are taken from those placed on the internet as being in some way exemplary. Text A: posted by the student’s teacher as a commendable example of an empathetic text. In the teacher’s words, they were not trying to recreate what was, but in their writing trying to grasp the events of the Holocaust. (Holocaust Diaries by Students: The Stories are Fictional, The Learning is Not, www.remember.org/imagine/diaries.html).

Text B: one of the 2005 winners of the Holocaust Remembrance Competition – a national essay contest for high school students that is designed to encourage and promote the study of the Holocaust. (www.holocaust.hklaw.com/essays/2004/20041B.htm).

Text C: Exemplar Examination Essay History 2004 (High Achievement Band), Higher School Certificate Examination, New South Wales.

Text D: excerpt from a tertiary text used by writing support services of Monash University to illustrate the features of competent writing in History.
(www.monash.edu.au/lls/llonline/writing/arts/history/2.2.1.xml).

2 From Course of Study: History (Ancient and Modern), Western Australia Curriculum Council, www.curriculum.wa.edu.au/.

3 As above.


5 As above.

6 A large-scale analysis of secondary student texts currently being undertaken by the author in collaboration with Frances Christie will provide a firmer basis for such generalizations.

References


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8 Constructing an Effective ‘Voice’ in Academic Discussion Writing: An Appraisal Theory Perspective

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1 Introduction

Arguing convincingly in academic discussion is a valued skill, yet experience and research (Thompson 2001: 67–72; Hood 2004a: 5–10) suggest that novice and even postgraduate writers have difficulty in this area. The knowledge and interpersonal skills it entails are largely ignored in the pedagogic literature, which tends to emphasize conformity to academic standards such as ‘objectivity’, ‘impersonality’ and ‘caution’ and, if it deals at all with ‘persuasive’ writing, to emphasize the provision of supporting examples, citations and ‘facts’ (Smalzer 1996: 176–7; Oshima and Hogue 1998: 71–97), rather than engagement with topics and readers.

This chapter considers what appraisal theory might tell us about the resources involved in writing persuasively as well as appropriately in discussion, drawing on the notion of textual voice, which, in the systemic functional linguistic (SFL) perspective, has been equated with ‘stance’ (Martin and Rose 2003: 54), and ‘interpersonal style’ (Coffin 2002: 519). Appraisal theory research into genres in media (Iedema et al. 1994; White 1998) and history discourse (Coffin 1997, 2002) has mapped the resources by which more or less ‘subjective’ and ‘objective’ types of textual voice are construed (see also Martin and White 2005: 164–86). Researchers have shown too that a clearly positioned, i.e. ‘subjective’ and explicitly evaluative, textual voice is valued by examiners of secondary school essays (Rothery and Stenglin 2000; Coffin 2002), confirming preferences at tertiary level and in professional academic writing (Hyland 2005: 180), and, more importantly, providing linguistic evidence for those preferences. Here, an appraisal analysis of two pieces of ESL discussion writing
shows that resources from the ENGAGEMENT system, which is directly concerned with ‘how language construes social roles and relationships’, and with its potential ‘to influence beliefs, attitudes and modes of inter-relating’ (White 2003: 259) are central in distinguishing a persuasive from a less persuasive textual voice, suggesting that priority should be given in EAP or academic literacy programmes to teaching these resources. It is further argued that the philosophical underpinning of appraisal theory and the ENGAGEMENT system may offer a helpful alternative to traditional approaches to interpersonal meaning found in the pedagogic literature.

2 Interpersonal meaning in the EAP pedagogic literature

Analysis of what the teaching manuals say and teach concerning attitude and positioning shows some implicit assumptions. One is that attitude is an expression of the writer’s personality, shaped by the formal conventions of academic style. Textbooks thus work to counteract tendencies to, say, dogmatism, and apprentice writers learn that they may adjust the level of assertiveness and/or tentativeness in expressing their views towards a topic. Accordingly, resources – e.g. ‘hedges’ and ‘boosters’ – for expressing these attitudinal dispositions are taught (Jordan 1998: 68–9) or advised (Smith and Smith 1990: 144). Attributing authoritative sources is presented as a way of bolstering the writer’s argument (e.g. Smalzer 1996: 177) and/or showing knowledge, as well as being necessary to avoid plagiarism. However, the possibility that means other than attribution might be involved in including or excluding views other than the writer’s is not contemplated, and consequently, neither are ways in which the deployment of such means shapes perceptions of the authorial voice. This conception of attitude as emanating from the writer derives perhaps from a generally held view of the text as a revelation of the writer’s mind or state of knowledge (White 2003: 261), rather than as a representation of a communicative context, and is probably tied to notions of intellectual property and authorship of ideas, and to the value traditionally set on originality in the Western intellectual tradition.

A second assumption, related to the above, is that interpersonal meaning is little more than a matter of scholarly etiquette, which must be learned and observed. Accordingly, novice writers are taught the linguistic forms required to fulfil standards such as formality, impersonality and objectivity. This is done via activities – e.g. identifying colloquial phrases and/or re-writing them in a more formal style (Waters and Waters 1995: 113; Seal 1997: 35; Jordan 1998: 88–9), and re-writing ‘categorical’ statements more cautiously (e.g. Jordan 1998: 89) – whose focus is more on form than on the negotiation of meaning.

A third implicit assumption concerns the reader, who is conceived as someone more expert, whose expectations must be deferred to. Thus, ‘keeping the reader in mind’ (Smith and Smith 1990: 119; Waters and Waters 1995: 116; Oshima and Hogue 1998: 2) is more a matter of learners
‘shap[ing] their writing to meet the expectations of educated native readers of English’ (from the back cover of Smalzer 1996) than of writers engaging with their readers’ expectations, in the process of involving them in some developing argument. In this view, even the need for organizing information in logical ways is seen in terms of deference to the reader: it makes information accessible (Oshima and Hogue 1998: 18) rather than arguments credible or convincing. This essentially unidirectional view of the communication process leaves largely unexplored the rhetorical potential of the linguistic forms taught to achieve detachedness, uncertainty, coherent organization of ideas and support via attribution, because, as the metalanguage itself suggests, the need for such a potential, in terms of engaging affectively with readers and topics, is not envisaged.

There may be an inherent contradiction here, for at the same time, novice writers are enjoined to ‘take up a position’ on the topic they are writing about (e.g. Waters and Waters 1995: 19; Smalzer’s essay assessment criteria, 1996: 272), in order to persuade the reader of the validity of some view. And if we consider that ‘evaluate’, ‘compare/contrast’, ‘discuss’ and ‘to what extent’ are among the ten most frequent expressions occurring in exam essay questions (Jordan 1998: 124; see also Smith and Smith 1990 and Waters and Waters 1995: 94 on the language of essay titles), this seems reasonable advice. All suggest that some degree of evaluation and persuasion will be required in the answers, and that these are skills which students need to learn, in order to succeed in their written exams and essay assignments. However, apart from some summary indications (e.g. Smith and Smith 1990: 143 advise against the weakening effect of giving more than one argument in favour of a position against that of the author), little or no attention is paid in the pedagogic literature to the skills of positioning and persuading, and the language resources they require.

This lack may also derive from the view that there are ‘subjective’ and ‘objective’ types of exposition, and that the latter, being the dominant type, is more attention-worthy. Oshima and Hogue explicitly adopt this position (1998: ix, 3), and Jordan dedicates only one of his 19 function-oriented units to discussion, in which ‘we need to express our opinion and views’ (1998: 76), directing the user to a related unit on introductions and conclusions, and two others on attribution of sources. However, it may also be that the widespread recognition in the scientific literature of the dialogic and interactive nature of writing, and findings of the recent and growing research interest in evaluative meaning in a range of discourse domains (e.g. Lemke 1990 on technocratic; Hunston 1993, 2000 on scientific; and Thompson 2001; Hyland 2002a, 2002b, 2004, 2005; Hyland and Tse 2004; Hood 2004a, 2004b, this volume, Chapter 9, on academic discourse), have yet to find their way into the textbooks. Appraisal theory, in the context of this concern with evaluation, has been a major development.
Appraisal theory is concerned broadly with the language of evaluation. It represents a development of the ‘affect’ dimension (Poynton 1989; Martin 1992: 523–35) of the tenor variable within the SFL model of situational context (Halliday 1989). A comprehensive overview of the theory to date is found on the appraisal website (White 2005), in Martin and Rose (2003: 99–165), and in Martin and White (2005). Christie and Martin (1997) bring together some of the results of the research undertaken in the ‘Write it Right’ project led by Martin, in the course of which the theory was developed. A useful and succinct account of the project’s rationale is found in Coffin (2002: 507–8; see also 509–11 for appraisal theory) and a fuller description in Veel (2006). What follows is an essential outline, in which greater space is given to White’s recent development of the ENGAGEMENT system.

The lexical resources for expressing attitude are grouped within three systems: AFFECT, JUDGEMENT and APPRECIATION (Martin 2000). These are semantic domains concerned respectively with emotional responses, moral assessments of behaviour and aesthetic judgements of things, texts and processes. Each system has a negative and a positive dimension, and comprises sub-categories. JUDGEMENT includes SOCIAL ESTEEM (assessments of people’s normality, tenacity and capacity), and SOCIAL SANCTION (more morally charged assessments of veracity and propriety). APPRECIATION includes the variables REACTION (impact and quality), COMPOSITION (balance and complexity) and SOCIAL VALUATION (the importance or significance which phenomena have within a given social context). As well as its systemization of the seemingly unmanageable area of attitudinal lexis, an important feature of the theory is its acknowledgement of implicit appraisal, which is said to be evoked or tokenized, as well as explicit, or inscribed appraisal. Also central to the theory is the recognition that every act of evaluation involves an appraiser, an appraisal and the thing or person appraised. GRADUATION comprises the resources for adjusting focus and intensity (see Martin and Rose 2003: 37–43 and Martin and White 2005: 135–53), and ENGAGEMENT, the range of linguistic means by which speakers/writers engage with their topics and listeners/readers (White 2003; Martin and White 2005: 92–134).

White’s typology (2003) of the lexicogrammatically disparate resources of ENGAGEMENT is derived mostly from his work on media discourse (1998). The type and distribution of ENGAGEMENT resources are likely to differ in academic discourse, for, as Hyland (2005: 175) notes, the latter’s readership is narrower, generally known, and the scope for expressing opinions, smaller. Nonetheless, though more research is required to locate, quantify and categorize them, many salient features of academic writing fall within the scope of ENGAGEMENT.

The philosophy underpinning White’s development of the ENGAGEMENT system is explained in White (1997). Like appraisal theory generally, it is...
informed by the Bakhtinian notion of dialogicity, which conceives of texts as a dialogic space in which a variety of voices, including the textual voice, can participate. This participation may be explicitly announced, e.g. through the use of attribution, authorial self-mention, or direct address to the reader, but may also be implicitly realized in diverse ways.

A primary distinction in White’s typology of engagement resources is made between monoglossic and heteroglossic utterances. Monoglossic utterances are bare assertions, such as the following taken from an ESL undergraduate essay:

1. The main advantage of the death penalty is that it is a deterrent against the growth of crime all over the state.

This type of construct is characteristic of ‘factual’, more monologic prose. An unattributed, unmodalized declarative, it presents the proposition as mono-vocal (no other view is foreseen) and unproblematic. It will be noted, however, that the proposition is not an objective statement of fact, but makes an evaluation with which not everybody would agree. Through this monoglossic formulation, however, both the writer and reader are aligned with the position expressed.

By contrast, heteroglossic utterances are ‘dialogized’ in that they do evoke other, similar and alternative views to that with which the textual voice is aligned. This dialogization is achieved through features such as projection or attribution, modality, negative polarity, comment adverbials and concessives. All the sentences in this excerpt from another essay on the same topic are heteroglossic:

2. It is popularly believed that the state is always right. But if it is not? If it is wrong? How could it manage to withdraw its condemnation after a death?

In the first sentence, through projection, the view that the state is always right is attributed to a large though unspecified group of people. Starting the second, concessive ‘but’ raises the alternative view, that the state may not always be right. This view is evoked through two rhetorical questions, perhaps the most obviously dialogic of engagement resources. A third rhetorical question ‘How could it manage to withdraw its condemnation after a death?’ invites the reader to supply the answer that it could not (and to make a consequent negative judgement of the practice of capital punishment). In diverse ways, then, these utterances are dialogized, i.e. they suggest the presence of voices other than the authorial one.

Within the category of heteroglossic utterances, White’s typology operates a further distinction between two groups of resources: those said to be dialogically expansive, because they open up the dialogic space to other voices, and those said to be dialogically contractive, closing down the dialogic space by fending off other views, more or less vigorously. These contractive resources are further divided into two categories: disclaim and proclaim. The most contractive are those which disclaim, i.e. reject positions evoked or explicitly referenced by the author. Those which
proclaim express some degree of personal commitment of the speaker/writer/thinker to the proposition.

Excerpt 2 above exemplifies some expanding and contracting resources, and the layering effect of their deployment. The projecting clause ‘it is popularly believed’ in the first sentence is a case of dialogic expansion through a resource labelled attribute in the typology. The belief that the state is always right is attributed to an (unspecified) group, thereby opening up the dialogic space to accommodate this view. Within the projected clause, ‘the state is always right’, we have by contrast an instance of dialogic contraction of the type proclaim: pronounce. Through the modality of usuality, expressed by the frequency adverb ‘always’, the proposition that the state is right carries the stamp of conviction of those to whom it is attributed. Concessive ‘but’, on the other hand, which introduces three rhetorical questions, is an instance of disclaim: counter. It

| Table 8.1 The system and sub-systems of engagement (following White 2003) |
| Dialogic contraction |
| **DISCLAIM** | **DENY** | But this tragic reality does not concern only some of the countries belonging to the ‘Third World’. |
| **COUNTER** | Most people do not agree with the death penalty, however, for a number of reasons. |
| **PROCLAIM** | **CONCUR** | It is popularly believed that the state is always right. But if it is not? If it is wrong? How could it manage to withdraw its condemnation, after a death? |
| **PRONOUNCE** | It is clear, therefore, that there are arguments for, and arguments against. |
| **ENDORSE** | In order to overcome crime, people have to care about improving the quality of life for the country and for themselves. |

| Dialogic expansion |
| **ATTRIBUTE** | **acknowledge** | Some argue that the physical elimination of very dangerous people is the only possible solution to defend society from tremendous injury. |
| **distance** | It is claimed that a remarkable monument, such as the electric chair, symbolizes the power of the legal system or the state. When the criminals have the intention of committing a crime, the fear of death can stop them. |
narrows the space, by announcing that this widely held position will be countered.

The instance of dialogic expansion: ATTRIBUTE in the opening sentence is followed by examples of the second type of expansion: ENTERTAIN. The use of ‘if’ in the two questions which follow open up the space, to ‘entertain’ an alternative view. The questions themselves, ‘[ ] if it is not? If it is wrong?’ also perform this dialogically expanding function of ENTERTAIN, in that they invite the reader to consider the possibility that the state may not be infallible (a similar rhetorical effect could have been achieved with ‘may’, e.g. ‘the state may be wrong’). The third question How could it manage . . .? however I classify as dialogic contraction of the type PROCLAIM: CONCUR, on the grounds that it is not open-ended, but invites the reader to supply the obvious answer, in this case, that the state could not withdraw a death sentence once carried out (on rhetorical questions, see White 2003: 267–9).

Two further contracting categories are DISCLAIMER: DENY, achieved through negation, and PROCLAIM: ENDORSE. The latter category includes resources such as attitudinally-charged reporting verbs, possibly used with comment adverbials, to indicate support for others’ claims (e.g. X convincingly demonstrates that . . .); ‘boosters’ (of course, certainly), and deontic modality, to make some recommendation for action (capital punishment should be abolished; the government has to take action). Table 8.1 sets out in full the categories of dialogic contraction and expansion, with examples from ESL undergraduate essays on the same topic.

4 Voice theory

Researchers involved in the development of appraisal theory have identified patterns of deployment of appraisal resources corresponding to characteristic types of ‘voice’ in genres within the discourse domains of journalism (Iedema et al. 1994; White 1998) and history (Coffin 1997, 2002). The mapping of these voice patterns or inter-subjective positioning styles – three in each domain – accounts for how our impressions of the subjectivity and objectivity of texts are formed. Thus, in media discourse ‘reporter’ and ‘writer’ voice have been distinguished. The former is characterized by attributed and tokenized judgements (thus the author is seen as ‘objective’ and not personally responsible for any evaluation), and is found in reports of ‘hard’ news. The more subjective, writer voice may take two forms. ‘Correspondent’ voice features unmediated inscribed judgements of SOCIAL ESTEEM (normality, capacity, tenacity), and the more strongly evaluative ‘commentator’ voice, explicit, unmediated SOCIAL ESTEEM and SOCIAL SANCTION (honesty and propriety) judgements. Coffin’s investigation of history discourse also identified three similar patterns of appraisal resources (2002: 516–20). These patterns realize ‘recorder’, ‘interpreter’ and ‘adjudicator’ voice. The first is characterized by lack of explicit JUDGEMENT and APPRECIATION: SOCIAL VALUATION, and like reporter
voice in media discourse, is perceived as ‘relating the facts’, and hence as more objective than interpreter and adjudicator voice. Interpreter voice will not use JUDGEMENT but often deploy APPRECIATION: SOCIAL VALUATION, whereas adjudicator voice will use both SOCIAL ESTEEM and SOCIAL SANCTION judgements. Each of these two patterns colour the text with more explicit, subjective opinions than ‘recorder’ voice.

Of particular interest from an educational perspective, Coffin’s research found that higher grades tend to be awarded to secondary school history essays whose writers use the more explicitly evaluative mode associated with interpreter and adjudicator voice (2002: 515–16). In secondary school literature, also, Rothery and Stenglin (2000: 242) find that successful essays in literary criticism deploy a high level of explicit evaluation from the system APPRECIATION (and note the lack of attention to teaching these resources in schools). Such findings confirm the wisdom of the EAP textbooks’ injunction that novice writers take up a position towards their topic, but more importantly, they provide linguistic evidence of how this may be achieved.

These early research outcomes suggest some directions for further investigation of appraisal resources across disciplines and genres, both in professional academic writing and in secondary and tertiary education. Are there patterns of distribution creating textual voice which may be said to be typical (Hyland 2005: 175) and could therefore be usefully taught? How and how far is the deployment of appraisal resources constrained by the discourse domain and genre (Martin 2000: 157; Rothery and Stenglin 2000: 241; Coffin 2002: 520), and how far is this deployment a matter of individual creativity? At school and university level, are there patterns in essays which are preferred by readers/assessors, and if so, what do these preferences entail, and do they differ among communities (Johns 1997: 58–64)? Also, textual voice may be seen as the result of an overall strategy, which entails variation throughout a text. Coffin draws attention to strategic shifts in ‘key’ in history essays (2002: 521–4). Also, Hood (2004c) showed how evoked and inscribed appraisals in academic discourse anticipate and refer back to each other intra- and intertextually in a dynamic interplay crucial to their understanding. Her findings may lend support to Thompson and Zhou’s argument that ‘evaluative coherence’ – ‘the way [ ] writers work to convey a consistent personal evaluation of the topic they are dealing with’ (2000: 123) – is constructed similarly to the building of propositional coherence through textual cohesion (Halliday and Hasan 1976; de Beaugrande and Dressler 1981: 48–83; Hasan 1989). Further research could shed more light on how appraisal resources support voice strategy, in a dynamic rather than a synoptic perspective.

Prompted by the findings of voice theory research, that ‘voice’ is a measure of the presence of certain appraisal resources in texts, and by White’s (2003) more recent development of the ENGAGEMENT system, I carried out a comparative analysis of two short ESL discussion essay answers to the same question. It took into account levels of
evoked/inscribed, mediated/unmediated APPRECIATION and JUDGEMENT, and ENGAGEMENT, with a view to exploring what is involved in creating the perceptibly different textual voice of each essay, and whether any particular appraisal feature was key in differentiating a successful from a less successful textual voice.

5 Constructing authorial voice in discussion

5.1 Presentation of texts

The essays were written by ESL first-year undergraduate students at an Italian university – both native Italian speakers – as part of a ‘mock exam’ held towards the end of a writing skills course, in response to the question: ‘What are the arguments for and against the death penalty?’

As far as finding and organizing information is concerned, the task was relatively straightforward. Most students know at least some of the arguments on both sides, and most chose to present, in the ‘body’ of their essay, first one set, then the other. Treating the arguments ‘objectively’, however, may have been less straightforward, as the writer of essay B (below) points out in his introduction. The death penalty is a morally charged issue, and to discuss it in a balanced, academic way, may present something of a challenge. In a European context it is an issue on which students aligned with the official European view ‘against’ – the majority – are unlikely to experience reluctance to take up a firm position; they may have difficulty, rather, in showing restraint. Students on the other hand who feel that the death penalty is justified in certain cases, may feel awkward about challenging the ‘against’ position (widely held in Italy, and supported by the influential Catholic church). The topic and the question – which leaves the writers some freedom as to how far they ‘intrude’ into the exposition – thus seem well-suited for exploring how students respond to the need for showing their knowledge of the different arguments, ‘taking a balanced view’, and taking a stand (which the question does not explicitly require).

A range of responses ensued. Some writers favoured a more monologic, factual, ‘explain what’ type of analytical exposition (Martin and Peters 1985: 87–8), at least during the presentation of the arguments. Many of these writers, however, explicitly stated their position in the conclusion, though they had not argued for it previously. Inevitably, these essays came across as rather weak, in terms of stance. Other writers chose to engage with the topic and the views surrounding it whilst presenting the arguments, adopting a more discussion-oriented, ‘persuade that’ type of analytical exposition (Martin 1989; see also Coffin 2004, on the SFL model and for an overview of the argumentation literature). These writers did not confine their stand-taking to the conclusion, but evaluated, more or less explicitly, either one or both sets of arguments simultaneously with their presentation. This lent greater credibility to any stand-taking in the conclusion, where many switched to a hortatory mode, making a
suggestion for action, e.g. that the death penalty should be abolished worldwide.

The two essays analysed are comparable in terms of grammatical consistency and organization of content. Each writer adopts a four-part structure: introduction, three arguments for, three arguments against, conclusion. Each comes down against the death penalty in the latter. However, the matter of ‘voice’ is approached differently, with one writer handling this more successfully.

5.2 Appraisal analysis

The essays have been coded for ATTITUDE (APPRECIATION and JUDGEMENT: SOCIAL ESTEEM/SANCTION) and ENGAGEMENT (the categories of dialogic expansion and contraction) resources. As might be expected, the main focus of the implicit and explicit evaluation in each essay was the death penalty and the reasons invoked to support or denounce it. Where the death penalty is treated as a process/thing (e.g. as a deterrence from crime), the appraisal coding is for APPRECIATION; where it is evaluated as a behaviour of the state (e.g. as an act of barbarity), the coding is for JUDGEMENT. The key to annotation is as follows:

Underlined = unmediated appraisal

T = tokenized appraisal

italics = APPRECIATION

bold italicized = JUDGEMENT SOCIAL SANCTION

bold = JUDGEMENT SOCIAL ESTEEM

some say"" = ENGAGEMENT dialogic expansion

as a matter of fact"" = ENGAGEMENT dialogic contraction

Essay A

In many states the death penalty is present in the constitution (USA, China, South America, Africa, the Middle East). The death penalty is foreseen only for such crimes as murder, mass murder, or crimes against humanity. Death sentences are corresponded with crimes against the national ideology, adultery, and theft. Some states argue that there are many advantages to this system, but international organisations (UN, Amnesty International) and several democratic states often see some disadvantages, too.

The main advantage of the death penalty is that it is a deterrent against the growth of crime all over the state. When the criminals have the intention of committing a crime, the fear of death can stop them (T). Another advantage is that all the community feels confident by joining against the criminals and discovering the power of Truth and Justice (T). Finally it can teach what is good and what is bad, and the respect for life (T).
Most people do not agree with the death penalty, however, for a number of reasons. Firstly, the death penalty is not a deterrent as a matter of fact. There are many more crimes in the USA than in Italy (T). The community grows away from the state (T) because the authorities are not able to guarantee their safety (T). Moreover the state cannot commit a crime (T). Murder is a crime and the state cannot punish crime by committing another crime (T). Lastly, states that have recourse to the death penalty do not respect life (T) and so they cannot be an example for the community (T).

It is clear, therefore, that there are arguments in favour of the death penalty, and arguments against, but probably most of the states that apply the death penalty do not agree with it for crimes such as theft, adultery, and lack of respect (T). Certainly crime has been a growing problem all over the world in the last 30 years (T) but the solution is the death penalty (T). The primary responsibility for coping with crime rests ultimately with social means (T). In order to overcome crime, people have to care about improving the quality of life for the country and for themselves (T).

From a structural point of view, the essay is well organized. The paragraphs have topical unity. The use of listing devices, e.g. firstly, moreover, lastly and logical connectors, e.g. however, but, and so leads the reader through the exposition of the arguments, of which there are three for, and three against. However, a major problem with the essay is that it lacks evaluative coherence, namely a clear, consistent textual voice. This is due partly to the a priori nature of the arguments (very little justification is provided for either set), but above all because it appears that the writer is aligned and aligning the reader first with one set, then with the other. In this way, the conclusion, where the writer comes out against, proves somewhat unconvincing.

The second essay is a more successful response.

Essay B

It is difficult to hold an objective point of view about a ‘philosophical’ [morally charged] topic. Most of all if one is asked to express opinions concerning the liberty of the individual and the death penalty. I am going to explain the points for and against the death penalty.

The first argument in favour of the death penalty is that it costs less to a state to kill a person than to maintain him closed in a prison for years. (T)

Secondly it is claimed that a remarkable monument, such as the electric chair, symbolizes the power of the legal system or of the state. It demonstrates with a fixed example how ‘bad and dangerous’ men are treated by the state. (T) It should [is supposed to] be the absolute summary of the consequences of what a man cannot do. (T) The fear of death should [is supposed to] avoid men to commit certain crimes. (T)
Thirdly, some argue that the physical elimination of very dangerous people is the only possible solution to defend society from tremendous injury. By contrast, argument against are based on consideration of the dignity of human beings (all of them, even if they are guilty of atrocious homicide).

The first point against the death penalty is the peremptoriness of this condemnation. It is popularly believed that the state is always right. If it is wrong: How could it manage to withdraw its condemnation after a death? Or, better: the state (in the USA, for instance) has the power to kill a person, not to bring back to life an innocent.

Secondly, the intensity of a fact does not always correspond to its effects. Let us suppose a psychopath wants to make a demonstrative act, which could be heard all over the world. If he knows that if he kills five or fifty people, he is always going to get the same verdict, how could he react? In this case, there will be no proportionality between condemnation and punishment. There will not be a range of solutions for disciplinary action.

Lastly, it is to [we should] consider that an intense event of pain has a strong effect after it becomes ‘usual’, after the people ‘get used’ to this kind of condemnation, after they become accustomed to the idea of the death penalty. An all life long condemnation scares men more than a 5 minute injection or an electric shock. In this way we observe the different behaviour of public opinion in the USA and in Europe every time there is an execution in Texas, for example.

Taking everything into account, if we assume that the state is an instrument for defending the integrity of society as a whole, we can consider the right of the state superior to that of the individual. Consequently the state claims the right to eliminate physically every danger or factor of instability in society. But if we assume the state is a collectivity, a composition of lots of human beings, the state should guarantee every single part of its own body the safeguard of his right to live and the death penalty should be abolished as an act of inhumanity in a modern society.

In terms of content and organization, this essay is broadly similar to A. Unlike A, though, it has a clear, consistent textual voice, it argues rather than pronounces, and the concluding sentence, which makes a recommendation for action, carries greater conviction than A’s similar conclusion does.

The total occurrences of the following were calculated in each essay: inscribed (explicit) appraisal and tokenized (implicit) appraisal; mediated appraisal and unmediated appraisal; APPRECIATION (inscribed and tokenized); JUDGEMENT (inscribed and tokenized); JUDGEMENT: SOCIAL ESTEEM and JUDGEMENT: SOCIAL SANCTION. All these items, it will be remem-
bered, were found by voice theory researchers to be significant in construing voice type as more or less objective/subjective. Also calculated were occurrences of ENGAGEMENT: dialogic contraction, and ENGAGEMENT: dialogic expansion, a distinction which represents a more recent development (2003) in White’s theorizing of ENGAGEMENT resources. The numbers are set out in Table 8.2 above, showing the ratios in each essay between tokenized and inscribed appraisal, between mediated and unmediated appraisal, between APPRECIATION and JUDGEMENT, between SOCIAL SANCTION and SOCIAL ESTEEM and between ENGAGEMENT resources of dialogic contraction and dialogic expansion. The table thus highlights the different balances of these voice-construing resources within each essay.

Essay A (354 words) is about three quarters the size of B (477 words). Bearing this in mind, we can see that quantitatively speaking, the two essays deploy resources of APPRECIATION (A 9, B 12), JUDGEMENT (A 9, B 10) and ENGAGEMENT (A 29, B 31) in roughly comparable amounts. A uses proportionally more tokenized than inscribed appraisal compared to B (A15:3, B14:8). A more striking difference however is the more marked predominance of SOCIAL SANCTION over SOCIAL ESTEEM in A (8:1) than in B (7:3); another is that almost all the appraisal in essay A appears unmediated (2:16), whilst essay B uses both mediated and unmediated appraisal, though more of the latter (9:13).

These results would suggest a stronger, more subjectively coloured textual voice for ‘A’ than for ‘B’, akin to the ‘writer’ voice of journalism, or ‘adjudicator’ voice of history discourse which found favour with assessors of secondary school history essays (Coffin 2002). However, such is not the case. The textual voice in B is stronger than that in A; it has more persuasive power. How can we account for this?

It will be noted that there is a significant difference between the two essays in the ratio between ENGAGEMENT resources of dialogic contraction and those of dialogic expansion. A is heavily contractive (18:11), whereas B shows a more even balance (16:17) between the two. Furthermore, if we consider in finer detail the ENGAGEMENT resources deployed by each (see Table 8.3 below), it emerges that B also draws more evenly on resources from the various subsystems than A (in which DENY accounts for a third of the total):

### Table 8.2 Quantitative survey of resources construing voice in two discussion essays

<table>
<thead>
<tr>
<th>Ratio</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPRAISAL tokenized : inscribed</td>
<td>15:3</td>
<td>14:8</td>
</tr>
<tr>
<td>mediated : unmediated APPRAISAL</td>
<td>2:16</td>
<td>9:13</td>
</tr>
<tr>
<td>APPRECIATION : JUDGEMENT</td>
<td>9:9</td>
<td>12:10</td>
</tr>
<tr>
<td>JUDGEMENT SOCIAL SANCTION : SOCIAL ESTEEM</td>
<td>8:1</td>
<td>7:3</td>
</tr>
<tr>
<td>ENGAGEMENT dialogic contraction : expansion</td>
<td>18:11</td>
<td>16:17</td>
</tr>
</tbody>
</table>
An adequate explanation of the different perception of authorial voice in each essay would require an analysis of their distribution throughout, which among other things, might mention how writer B engages more with the ‘against’ arguments than A does, invoking a ‘reader-in-the-text’ (Thompson 2001: 60) against whom to argue, and drawing on expanding and contracting resources to bring in and then refute arguments, whereas A draws exclusively on contracting resources (mostly negation), to refute them. Space does not allow such an account. Nonetheless, the synoptic overview of ATTITUDE and ENGAGEMENT resources above does give some indications. The marked differences between the two essays in the area of ENGAGEMENT would suggest that the latter system plays a more significant role in construing a persuasive textual voice than ATTITUDE. In other words, when two apprentice writers know and are able to articulate the same or similar arguments, it is the handling of ENGAGEMENT resources that will distinguish the writer skilled at seeking to persuade the reader of a particular point of view from one less skilled. The results suggest that constructing an effectively persuasive textual voice implies drawing on a wide range of ENGAGEMENT resources, and possibly, achieving a balance between dialogically expansive and contractive resources. They confirm that in academic discussion, there is more to writing persuasively than being ‘assertive’, as the textbooks might imply, and suggest that doing so may be also, if not more, a function of the writer’s skill at orchestrating the participation of different voices and views in the dialogic space.

6 Implications for teaching

Researchers in dialogic interaction in academic discourse have highlighted the importance of similar resources in engaging persuasively with readers and topics, and in constructing the writer and reader (see e.g. Thompson 2001: 65–6, for a list based on his experience of postgraduate writing, and Hyland 2004; 2005, for a typology based on extensive corpus research). Also, many of the types of resources which come under ENGAGEMENT –

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**Table 8.3** ENGAGEMENT resources in two discussion essays

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialogic contraction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISCLAIM</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>DENY</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>COUNTER</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>PROCLAIM</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CONCUR</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>PRONOUNCE</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>ENDORSE</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Dialogic expansion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATTRIBUTE: acknowledge</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>ATTRIBUTE: distance</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>ENTERTAIN</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
reporting verbs, epistemic modal expressions, comment adjuncts, concessives – are already standard fare on EAP syllabuses (cf. the corpus-based research in Thurston and Candlin 2002). So there is nothing new in the claim that these resources are important, and need to be taught on EAP or academic literacy programmes. However, the ENGAGEMENT system both extends the range of resources involved in constructing the writer–reader relationship with respect to those envisaged in textbooks, and theorizes their functions differently. That is to say, it posits the role of these resources as being not (only) to reveal a particular writer’s ideas, or to control the level of a writer’s personality in a text, but to represent the communicative context as one of heteroglossic diversity.

In academia, far more than in the media, the notions of authorship, of writer responsibility and status are strong. Professional academics write not (only) to contribute to the community’s knowledge, but also to enhance their individual reputations, earn the esteem and respect of that community, and carve a niche for themselves and their research. If this were not so, anonymity would be the rule, the term ‘plagiarism’ would not exist, and nobody would bother about attributing sources because these would be either un-locatable or felt to be of no consequence. Authors are the pegs on which ideas are hung, and the emphasis in the pedagogic literature on the writer as the source of evaluation is therefore understandable.

However, the shift which the ENGAGEMENT system philosophy implies, from a ‘writer-centred’ to a ‘communicative context-oriented’ outlook, may be heuristically useful in discussion writing for several reasons, I think. First, it may go some way to relieve student writers of the anxiety that derives from being identified as the source of evaluative propositions in their essays, because it emphasizes the writer’s responsibility for orchestrating the play of perspectives around a topic, over the need for his or her adhesion to a particular view. Also, it stresses that skill at representing the communicative context will also shape perceptions of the textual voice, for the textual voice defines itself in relation to other voices, and acquires persuasive power through manipulation of the space afforded to them. Last but not least, analysis for ENGAGEMENT fosters awareness of the sources of evaluative propositions. This is a major consideration, since inability to locate the source of opinions in texts, whether through lack of attribution, as in essay A above, or through an overuse of epistemic modal expressions ‘cautiously’ deployed, can lead to evaluative incoherence, or confusion as to who thinks what. In short, encouraging apprentice writers to see their discussion writing less as extensions of their individual selves, ‘shaped’ to conform to readers’ expectations, and more as careful management of voices participating in a dialogic space, may equip them to tackle discussion writing more confidently.
Notes

1 I had some doubts concerning the layering effect of two or more types of ENGAGEMENT resource in the same ‘chunk’ of text, such as the use of dialogically expanding ‘if’ to introduce a rhetorical question with dialogically contracting negative polarity, as in ‘if it is not?’. Is the question thus expansive or contractive, or both? I have interpreted it as expanding, on the grounds that ‘if’ posits the proposition as a possibility. In the analysis of essay B below, I have collapsed the expanding functions of ‘if’ and ‘we assume’ in ‘if we assume’, and analysed the whole projecting clause as ATTRIBUTION.

2 Concerning ATTITUDE, it seems likely that in academic discourse generally, selections from the appraisal system APPRECIATION (e.g. interesting, useful, pertinent; see Martin 2000: 161) will be frequent, since processes, texts and things are commonly evaluated, though AFFECT may be present in Comments (e.g. fortunately, surprisingly – see Conrad and Biber 2000: 68 – and reporting verbs, e.g. state, claim, assert). As voice theory research thus far suggests, however, configurations of appraisal resources for attitude in academic writing are likely to be determined to some extent by the disciplinary field (e.g. the evaluation of behaviour of important figures in history) and by genre. It also seems likely, given the convention of avoiding overt expressions of attitude, that a great deal of appraisal in academic texts will be implicit (Hunston 1994: 193).

3 I would like to thank Donna Miller for her comments on my initial analysis. Responsibility for the choices made lies with me.

4 Thompson (2001: 70–2) reports an instance of ‘hubbub’ consequent to this, which he attributes to anxiety of the writer about expressing any view with which his supervisor might not agree. As part of what he terms ‘bringing the dialogue underlying argumentation to the surface’, and helping less experienced writers maintain evaluative coherence, he proposes using a checklist to help them track the sources of propositions in their texts.

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Disadvantaged Schools Program, NSW Department of Education. (Extracts downloadable from White 2005).


9 Arguing In and Across Disciplinary Boundaries: Legitimizing Strategies in Applied Linguistics and Cultural Studies

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1 Introduction

There has been much recent discussion in the fields of EAP (English for Academic Purposes) and academic literacy around the need to address disciplinary differences. Research studies that have responded to this call have frequently taken a corpus-based approach, to identify, for example, disciplinary specifics and variations for a given genre (e.g. Hyland 2000; Huckin 2001; Ruiying and Allison 2004), disciplinary specific relations between genres (e.g. Samraj 2004), or disciplinary preferences for particular grammatical constructions or lexical choices (e.g. Hyland 1999; Hewings and Hewings 2001). Other research has favoured a case study approach as a means for identifying the nature of disciplinary activity or practices around texts (e.g. Prior 1994; Samraj 2000). In general terms the goal has been to go beyond generalizations about academic discourse in order to provide more specific and better targeted support for novice and/or second language academic writers. While it is less frequently stated as an intended outcome, an understanding of the ways in which different disciplines use language differently is also fundamental to understanding the potential for effective collaboration, and to providing meaningful support for those who study and/or research across disciplinary boundaries. This is especially relevant in an evolving academic context in which cross-disciplinary study is more readily facilitated and cross-disciplinary research is actively encouraged.

The aim of this paper is to contribute to an appreciation of common ground and of difference, and thus to explore the potential for cross-disciplinary dialogue between two disciplines, those of applied linguistics (AL)
and cultural studies (CS). The choice of the two disciplines is motivated in part by a recognition of difference as seen from the perspective of this writer, writing as she is from the discipline of applied linguistics, and an interest in better understanding the extent of this difference and the linguistic choices that are drawn into the construction of a critical post-modernist stance in cultural studies research.

The approach taken here varies in a number of ways from both the corpus-based and case study research that has dominated recent academic literacy research. In this chapter I draw on a close analysis of just two texts, one from each discipline. Each is the introductory section of a PhD thesis. The applied linguistics text is my own thesis and is a discourse analytic study of evaluation in academic research writing. It represents a point of reference against which an apparently very different text is analysed. The cultural studies thesis is a postmodernist, post-colonial study of massacre of a group of Aboriginals in Australia in 1842. While I argue that each text is very recognizable as an instance of academic argument from its parent discipline, my aim is not to claim that it is representative of all such discourse. However, a close analysis of the linguistic choices that each writer makes and an identification of similarities and differences across these two texts does provide a basis for considering how each represents and argues for new knowledge. On this basis it is possible to consider the space such instances afford for cross-disciplinary dialogue or research initiatives, as an indication of broader cross-disciplinary potential. The analyses also offer a model for comparisons across other disciplinary and research traditions.

The linguistic analyses of the texts draw on systemic functional linguistic theory, in particular theories of genre, and the discourse semantic system of Appraisal (Martin 1992, 2000; Martin and Rose 2003; see also applications using Appraisal in this volume by Derewianka, Chapter 7; Swain, Chapter 8; Hedeboe, Chapter 10). The analyses focus on how each writer argues for their research endeavour. Interpretations of how each represents a different orientation to knowledge are then made with reference to the sociology of knowledge (Bernstein 1999), and in particular to the structuring of knowledge in higher education (Maton 2000a, 2000b; Moore and Maton 2001).

2 Comparing the macro-structures of the texts

A comparison of the overall organization of each thesis reveals some similarity in that each includes an introductory section to the document as a whole. For the AL text, this is the first two chapters of seven chapters and for the CS text the first chapter of seven chapters. The introductory chapters function in each case to introduce the research focus and to provide arguments for the research endeavour.

These introductory sections are then analysed more closely to examine the rhetorical strategies employed by the writers. Differences in the ways
each writer argues are then considered in terms of how they reflect different orientations to knowledge. The analyses of the discourse address three questions:

i) what do the writers write about (Field)?
ii) how do they evaluate what they write about (Appraisal)?
and hence
iii) what kinds of arguments do they construct?

To begin with we can say that each writer constructs some representation of the object of study, the field that is the focus of the study or the phenomenon to be investigated. The writer herself may be the source of the representations or they may be projected through another voice. This other voice might be that of another researcher, or it could be a participant within the field being investigated. In addition each writer writes about the process of research itself, that is, about reflection or theorizing in relation to the object of study. Such representations of theory and research may consider the contributions of others, and/or they may focus on the contribution of the writer herself.

Drawing on these categories of what is written about, and the participants in the process, an initial crude comparison can be made between texts in terms of the proportions of text that are constructive of the different categories. Table 9.1 represents a comparison of introductory sections of the AL thesis and the CS thesis analysed in this study. The proportions are estimated by identifying the focus of each phase of text (as represented in paragraphing) and then identifying the amount of text (% of page space) oriented to each field focus.

This is a crude comparison. Nonetheless it provides a point of reference for a more detailed look at the ways in which the writers argue.

Table 9.1 A comparison of proportions of each text according to field focus and to sources

<table>
<thead>
<tr>
<th>Field focus</th>
<th>AL</th>
<th>CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representation of the object of study projected by the writer</td>
<td>7%</td>
<td>42%</td>
</tr>
<tr>
<td>Representations of the object of study projected by other sources</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>Discussion of theoretical contributions from others</td>
<td>44%</td>
<td>–</td>
</tr>
<tr>
<td>Descriptions of the writer and/or of the writer’s own text</td>
<td>22%</td>
<td>32%</td>
</tr>
</tbody>
</table>
3 Variations in realizing discussions of knowledge and sources

It is noted, for example, that equivalent proportions of the two texts represent the object of study as projected by other sources (AL 27 per cent, CS 26 per cent). However, a closer look reveals a difference in the nature of these other sources and in the kind of knowledge they project. In the AL text the other voices are those of other academic researchers/theorists. The knowledge is generalized and authorized by multiple sources as illustrated in [1]:

[1] AL

...the shift in literacy practices and expectations from secondary to tertiary learning presents major difficulties for many undergraduate students, difficulties that may remain unattended to in their formal learning experiences (Belcher 1995, Johns 1997, Gollin 1998), and which are compounded where academic writing is in English as a second language (Belcher and Braine 1995, Ventola and Mäuranen 1996 ...)

In the CS text, the projecting voices are those of participants in the domain of the object of study, that is, within the field being observed, and in that sense they are also data for the study. They are other individual knowers alongside the writer herself. The perspective of each individual source is local, that of a participant in the domain of the object of study, an insider. This is illustrated in [2]:

[2] CS

Hearing movement, Irby and Windeyer lay over the rocks and began firing into the group below knowing that their fire would bring up Connor and Weaver who also joined the slaughter (Irby 1908: 77 & 90)

The one exception to this in the CS text is the insertion of some brief extracts from scientific texts on the nature of granite, the stone that forms the rock at which the massacre took place, in which case the knower is an outsider/expert voice.

A comparison of the amount of text in which the writer herself is the source of knowledge about the object of study reveals a significant contrast (AL 7 per cent, CS 42 per cent), as does a comparison of the proportions of text oriented to a discussion of theoretical foundations (AL 44 per cent, CS 0 per cent). Taken together these differences can be interpreted as the CS text privileging the writer’s gaze on the world, or the writer as knower (Maton 2000a, 2000b), while the AL text privileges the theoretical framing of gazes, theoretical knowledge.

However, a deeper level of analysis is required here too. While no single phase of the introduction of the CS introduction is identified as primarily a discussion of theory, in the way that this is so for the AL introduction, the theoretical orientation of the thesis is nonetheless very apparent and referred to in many ways throughout the document. It seems then that each writer employs very different ways of representing theoretical influences. Extracts [3] to [9] are indicative of such references to theory in the CS text:
This thesis is also an attempt to write an embodied history and what Grace might call an ‘aesthesia’ of memory (Grace 1996: 3). (:9)

I am attempting to write a felt history that is written with as constant an acknowledgement as possible of the politics of now (Dening 1996: 191–200). (:9)

The variety of sources, the awkward efforts at articulating my/the massacre’s/history’s ‘outside belonging’ (Probyn 1996), (:10)

I wish to call this Australian cultural studies after Frow and Morris (1993: Introd), or, more particularly, given my institutional setting – critical/creative ‘New Humanities’ – a heuristic Hodgepodge (Hodge 1995: 35–39). (:10)

I also want to bear witness to the contradictions and constant ‘becomingness’ which cannot be communicated via any single and simple narration (Deleuze and Guattari 1987: 233 – and Gaetens, [Maras & Rizzo] 1995) (:10)

I am a ‘product’ of the institutionalising of the uninstitutionable and hang like a pardoned and amended Lepke in an oasis of found connections (Lowell 1965: 51). (:12)

Which of my multiple selves, which aspects of the Mobius strip am I textually elucidating for you? (Grosz 1993: 189) (:13)

The examples above all include a reference to a specific theoretical source and publication. However, reference information is not always provided. In some cases the use of a key term is apparently intended to trigger an intertextual connection for the reader without the source being specifically named. These lexical trigger choices may or may not be signalled by scare quotes. The extent to which such intertextual connections can be made by the reader are both dependent on, and an indicator of her/his insider status in the discipline, that is, of what kind of knower the reader is. The underlined terms in [10] and [11] may represent examples of this:

The paper and print that make up this invertualised text may not have the rhizonomic possibilities that your reader’s whim might desire (:11)

..but whether I have left enough readerly, liminal spaces to imagine in...

What is different about the theoretical referencing in the CS paper, from that in the AL paper, is that such references are all made in the service of describing and evaluating the writer’s own contribution. Most often the theoretical influences are coded in a word or phrase, which functions to call up the source of that wording, or they are obliquely signalled through imitation of style, something the CS writer explicitly refers to in her abstract as ‘my textual impersonation’. In this sense again the CS text is more knower-oriented. Theoretical influences are exemplified in the writer’s way of writing, rather than being explained or discussed and hence evaluated. Given this means for connecting to theoretical influences, it is not surprising to find that there are no dissenting researcher/theoretical voices, that is, there is no positioning of one in...
relation to another, as is typical in the applied linguistics text. In the CS text all referenced theoretical voices are represented as in alignment with the writer.

4 Analyses of resources of Appraisal

To this point I have compared the texts in terms of the overall structuring of different fields of discourse, and found distinct differences in the extent to which each writer represents herself in her introduction as a knower in relation to the object of study, and in the extent to which and the ways in which each writer engages with other knowledge in the field. In the following section I look more closely at the ways in which writers encode an evaluative stance, and what kinds of arguments they make. Here we turn to Appraisal theory, as a modelling of interpersonal meaning in the discourse semantics.

Figure 9.1 presents a model of semantic categories of Appraisal (Hood and Martin 2007). Within this model, ENGAGEMENT addresses options for expanding and contracting space for other voices; ATTITUDE encompasses different options for expressing positive or negative evaluation; and GRADUATION addresses the options we have for relativising meanings, either by scaling the FORCE of a meaning (e.g. intensifying or quantifying) or by grading the FOCUS, that is the bounded-ness of the meaning (e.g. as degree of specificity or completion). (Note: Small caps are used for sub-systems of Appraisal to distinguish a technical from a non-technical use of the terms.) In the following section I explore different kinds of arguments constructed

![Figure 9.1 Appraisal Network (Hood and Martin 2007)](image-url)
by the writers in terms of what gets evaluated (Field), and how (Appraisal). In analyses of the ways in which resources of Appraisal are deployed I focus in particular on ATTITUDE and GRADUATION. Analyses focus on how much the writer relies on particular kinds of arguments, and how these arguments are realized through resources of Appraisal.

5 Arguing in applied linguistics

Hood (2004) found that writers of research papers and dissertations in the disciplinary areas of education and applied linguistics tended to construct different kinds of argument in their introductory sections as they constructed a case for their own research.

The first kind of argument constructs the object of study as a worthwhile focus or site for research. The object of study is typically represented by the writer or by another source as interesting or important or troubling in some respect. Such discourse is characteristically relatively heavy in explicit ATTITUDE, and ATTITUDE may be expressed as appreciation (valuing an entity), affect (expressing a feeling or emotion) and/or judgement (evaluating people and their behaviour), depending on the specific topic. The multiple encodings of explicit ATTITUDE function to compel the reader to align with the writer’s stance, that is, that the topic is of interest or significance in some respect. A phase of text from the introduction to the AL thesis that contributes to such an argument is exemplified in [12]. The explicit ATTITUDE is in bold, and GRADUATION is in italics:

[12] AL

Explanations for the apparent lack of critique in students’ writing are generally framed in the literature in terms of naivety, unwillingness, or incapacity. Groom (2000), for example, suggests that many struggling student writers do not have a clear understanding of the nature and function of argument as an academic genre. They do not appreciate that they are expected to develop a position of their own in relation to a question, issue or field, or a position in relation to the contributions of other sources within a field. They are unaware that an evaluative stance is required. However, even with such insights, novice writers within an academic disciplinary community may be reluctant to take a critical stance. They may be unwilling to posit a critical view of a published author whom they regard as necessarily having greater insight, or they may simply lack confidence that they have in fact understood crucial aspects of what they have read.

A second kind of argument presents knowledge of the object of study as relative, contested or unresolved, in other words as open to the construction of new knowledge. This argument may be made by emphasizing differences in what is observed of the object of study. These differences may be either categorical differences (in bold), or ones of degree realized through resources of GRADUATION (italicized):

[13] AL

Casanave (1995) critiques the notion of an academic or disciplinary discourse
community as (…) becoming more and more meaningless as it is applied to specific settings, groups or individuals, where individual students can be seen to go about the process in very different ways (c.f. Lundell and Beach 2003). (…) Yet commonalities in the ways members of the academic discourse community engage with the construction of knowledge compared with practices characteristic of secondary education (Schleppegrell 2001), may still warrant use of the term academic discourse community, albeit in an abstract sense.

Alternatively, the second kind of argument may be made by evaluating the relative contribution of the projecting source, that is, by evaluating other research contributions (see [14]). Resources again include both inscribed ATTITUDE as well as GRADUATION, and counter expectance markers (boxed):

[14] AL

Many discourse level studies such as those discussed above, especially the more comprehensive approaches that incorporate multiple functions and resources such as those by Hunston (1997, 2000), and Hyland (1998) offer valuable insights into the complexity of the construction of evaluative stance. However, what has been missing to date in the framing of evaluation in discourse has been a theoretically motivated linguistically-based model for discourse semantic options in interpersonal meaning, that is, a means for theorising the relationship of language choices to semantic functions.

The third kind of argument is one in which the writer’s own contribution is evaluated in relation to other possible contributions (see [15]). Here there is some explicit ATTITUDE, which is almost always encoded as appreciation (not affect or judgement). Typically, however, ATTITUDE is more frequently invoked using GRADUATION to grade ideational meanings. The resources of GRADUATION used are frequently those of FORCE – implying an amplified meaning especially of quantity (amount or scope), or enhancement (frequency or vigour).

[15] AL

The current study extends this kind of analysis by drawing on a more comprehensive model of evaluation, and by approaching the analysis from a qualitative perspective, to enable a consideration of the patterning and interaction of resources in individual texts (…).

The study undertaken here intends to contribute further to this project.

Hood (2004) found considerable variation in the extent to which different kinds of argument were represented in the introductory sections of research papers in education and applied linguistics. Some relied heavily on an argument mounted primarily on the significance of the object of study. Others argued primarily in terms of the relative value of research to date. In a canonical introduction we might expect that the different kinds of arguments represented above would correspond to stages of the introductory section. So we might anticipate an initial discussion of the significance of the field in a ‘background/ rationale’, to
be followed by a literature review section in which knowledge of the object of study is attributed to other sources. The sources might be expected to project different evaluations of the object, and in turn to be differently evaluated by the writer. Typically the writer's own contribution is evaluated in a consolidating macro-New (Martin 1992) that functions as a transition to another stage of the introduction, or to another section of the thesis.

6 Arguing in cultural studies

To what extent are the kinds of arguments and the patterns of realization of those arguments that are represented in the applied linguistics research writing, also evident in the cultural studies thesis? It is important to note that, while there is no claim here that these patterns and differences should be anticipated in every applied linguistics or cultural studies text, they do serve to highlight some disciplinary differences that can be drawn upon to theorize about orientations to knowledge.

In the cultural studies introduction, as in the applied linguistics text, there is evidence of the first kind of argument. In extract [16] of the CS text, for example, the writer argues for her research endeavour in terms of the problematic nature of the object of study. The object of study, broadly interpreted as damage to aboriginal people, is presented as troubling through an accumulation of explicit ATTITUDE (bold) that is almost entirely negative, as well as an instance of what Martin (2000) refers to as a token of ATTITUDE (underlined) where the description of an event invokes a negative reading. Multiple instances of GRADUATION (italicized) also function to invoke an attitudinal meaning. The GRADUATION in some cases functions to amplify negativity (long term ... damage). In other instances it invokes meanings of significance through quantifying space (larger ... context; around the country). By implication the writer argues for the importance and worthiness of the object of study as a site of research.

[16] CS

But I am also writing within a larger cultural and national context. In 1996, very soon after their 'massacre' (as various newspapers reported it) of the sitting Labor party, the coalition took away 500 million dollars from the Aboriginal and Torres Strait Islander Commission (ATSIC). There was little public response from the non-Aboriginal population of Australia. While the ABC budget being 'slashed' by 30 million precipitated rallies around the country, there was a painful non-Aboriginal silence concerning the long term structural damage that such a cut to the central administrative body of Aboriginal affairs would produce. At the same time the non-Aboriginal Minister of Aboriginal Affairs spoke of 'good' and 'bad' 'Aborigines' and the white Prime Minister suggested some 'Aborigines' had benefited from being forcibly removed from their parents.

(Italicized references to 'Aborigines' are in the original text, and not part of the coding of appraisal.)
In constructing this kind of argument there are strong similarities between the AL [12] and CS [16] in terms of the multiple encodings of inscribed ATTITUDE in such phases of text. The ATTITUDE may be encoded as appreciation, affect and as judgement, and single instances may be amplified in FORCE. In each case multiple instances build a powerful prosody of negative value. The discourse functions to compel the reader to view the object as worthy of attention.

The second kind of argument identified is where the object of study is represented as relative, contested or unresolved, in other words where the field is represented as open to new knowledge(s). Unlike the AL text, in the CS text the other voices that contribute knowledge of the object of study are not those of other academic researchers (with the exception of the aforementioned sourcing of scientific texts on the nature of granite). As noted earlier the relative positioning and evaluating of other academic research voices is not a strategy used in the CS text for problematizing existing knowledge. However, the writer does represent the object of study as open to new knowledge by other means. A number of differing historical participant accounts of the object of study (the massacre), as well as various observations by the writer at different stages in her life are presented. While there is no overt evaluation of relative value or significance, there is an implication that additional observations would bring additional knowledges.

However, by far the most prolific means for making space for other voices, and hence new knowledge is to multiply encode the semantics of ‘openness’ or ‘unresolvedness’ in lexico-grammatical choices. In an Appraisal analysis this implicates the resources of GRADUATION as FOCUS (see Figure 9.1). FOCUS has to do with the sharpening or softening of boundaries of entities (realizing graded valeur) and of processes (realizing graded fulfilment). Resources of FOCUS enable the blurring of categorical meanings (of entities or processes), representing them as open, fluid or incomplete. The dominance of such resources in the CS text in construing openness to new knowledge(s) is very evident in [17], where multiple instances are italicised:

[17] CS

The Bluff Rock Massacre is a myth, is a fact, is a truth, is a protean tourist attraction, is a . . .

( . . .23 lines of differing interpretations of the ‘massacre’ citing 5 sources . . .)

So this thesis is organised loosely about five different sources; memory, published and unpublished diaries, letters, a tourist leaflet and some collected stories from a local historian. This list is itself indicative of the way in which this event is positioned as ephemeral and ephemera – it gives some sense of the event’s ability to appear and disappear (in its many forms) within history and is an almost hysterical formation of Raymond Williams’ patterns of history, since this event is always in a state of emergence and disappearance. But each moment a different story appears, the attempt can be made to map it within its own moment of difference while reflectively making of that past my own
present. The tension between these two efforts is the stage upon which this particular performance is set.

FOCUS is encoded through a whole range of linguistic and non-linguistic resources, including, degrees of fulfilment (realization / completion) encoded as things and as qualities, as in:

- a myth, is a fact, is a truth,
- is a protean tourist attraction,
- ephemeral and ephemera

emergence and disappearance
(in its many forms)

difference
indicative
attempt can
a different story
an almost hysterical formation

as processes:

appear and disappear
appears

or as circumstances:

organised loosely.

The semantics of +/− fulfilment are also realized graphologically, as in:

is a protean tourist attraction, is a ...

Elsewhere in the CS text other means include interrogative mood, as in:

...Who is failing to recognise whom or what?
...What is it to name oneself?

and scare quotes that signal provisionality, as in:

...But in the classroom and in the small arenas of the ‘local’,
...loving the landscape and readmiring ‘country’ values...

In the CS text, the writer makes use of an extensive array of resources of GRADUATION: FOCUS and they represent the dominant means by which the writer suggests the unresolvedness of knowledge.

The final area of comparison for the two texts is around arguments for the writer’s own contribution in relation to other possible contributions. Here the focus is in how each writer represents herself and her work. It was noted earlier that there is not a marked difference in the proportions of the introductory chapters of each thesis devoted to description and/or evaluation of the writer/ writer’s own contribution (AL 22 per cent, CS 32 per cent). Both writers construct an argument for their own contribution. However there are also significant differences in how this work is done. Extract [18] represents a phase of such discourse in the CS text. Inscribed ATTITUDE is in bold. GRADUATION as FOCUS is in italics:
The many stories and ‘radical’ fragments within this work can be envisaged as a series of sites to which the reader is exposed. As such it is the textualisation or perhaps the mechanisation of the virtual. It is the writing down of the common experience of moving the mouse from icon to icon, to the opening up of various ‘windows’ and menus that are travelled to from an originating search title that is ‘The Bluff Rock Massacre’. This already imagines the reading experience as both a composite set and a series of elisions. What sites, what images, interact with you the reader to define for you the meanings, effects and translations of words, settlers, authors and massacres? Is this reading of yours my ‘original contribution’ to scholarship?

There are of course real limitations and inevitable disappointments in my invitation to read like this. The paper and print that make up this invertualised text may not have the rhizonomic possibilities that your reader’s whim might desire. There are no connecting networks which would enable you to quickly refresh your memory on granite types while reading about the bluff, and in this sense the controlling limits of the project are obvious, for it is here that the role of the writer as curator becomes all too clear. The words are displayed and organised and you are invited to translate again, but whether I have left enough readerly, liminal spaces to imagine in, can only be decided by you. This is not to suggest in any way that my writing hovers off-stage where the effects of my authorial performance are rendered invisible. At all times I am setting you up, moving you along, sometimes playful, sometimes saturnine.

One difference of note between the CS and the AL text is in the amount and kind of explicit attitude that is encoded in self-evaluation. Where explicit attitude is used in the AL text in evaluation of own (or other) research, it is nearly always depersonalized as appreciation (valuing things). In the CS text, however, there is a heavy use of explicit attitude as both affect and judgement, or as appreciation: reaction, as in the instances listed below. (See Martin (2000) for elaboration of kinds of appreciation, affect and judgement). In other words there is a heavy reliance on personalized attitude.

‘radical’ [Judgement: normality]
disappointments [Appreciation: reaction]
whim [Affect: desire]
desire [Affect: desire]
controlling limits [Judgement: propriety]
playful [Appreciation: reaction]
saturnine [Judgement: propriety]

The first paragraph in [18] presents a description of the writer’s work as radical and multifaceted. This diversity opens up multiple realities for the reader. The implicit argument in this phase is that the work has value in these terms, that is, in terms of its lack of normality and its unresolved-ness. In the second paragraph, it is valued as a kind of entertainment for the reader (+appreciation: reaction), but also as flawed.

What is absent from the CS text is an argument for the thesis as making a contribution to knowledge in the sense of resolving any unresolvedness, or in Swales’ term ‘occupying a niche’, a research gap (Swales 1990). In
fact this is steadfastly avoided, with many explicit claims to the contrary. As in other kinds of arguments made in this text, resources for encoding and grading degrees of fulfilment and valeur (GRADUATION: FOCUS) are dominant, as the examples below indicate:

- can be envisaged
- the opening up of various ‘windows’
- perhaps the mechanisation of the virtual
- imagines the reading experience
- a series of elisions.
- What sites . . . ?
- Is this reading of yours . . .?
- my ‘original contribution’ to scholarship?
- may not have
- possibilities
- might desire.
- would enable you
- in this sense
- obvious,
- whether I have
- liminal spaces to imagine in,
- can only be decided
- not to suggest
- hovers off-stage

It is only when the writer negatively evaluates her work that she draws on resources to sharpen focus, to represent these are categorically so, as in:

- real limitations
- inevitable disappointments
- controlling limits
- becomes all too clear.

So while the AL writer argues for her own research space in relation to other knowledge, the CS writer argues for her own way of knowing. In this sense this is akin in some ways to an argument for a methodology, although, here it is not an argument for the methodology of enquiry, rather for the methodology of text construction. It is the writer’s way of ‘textualizing’ that is in focus. The way of knowing is represented as unique (original, novel) and individuated.

7 Conclusion

The findings of this comparative study reveal both similarities and difference in the ways in which each writer works to position her own research. Both writers at times present their object of study as a compelling site for research by loading up the explicit attitude to encode its significance or importance. There are differences, however, in the sourcing of those evaluations, in terms of whether they rely dominantly on academic researcher or participant voices. Both writers do make reference to other

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scholarship that is relevant to their own endeavour. However, there are also differences here. In the AL text these references are largely introduced by the writer’s attributing propositions to other sources. Other researchers and theories are positioned relative to each other and to the writer’s own position. They are represented as contesting theory and/or knowledge of the object of study, and the writer positions herself as relatively aligned or dis-aligned with other sources. In the CS text there is a preference for mimicry of style and trigger terms to evoke intertextual connections. The references to other scholarship all relate to the research process and to its ‘textualization’, and not to the object of study, and there is an apparent alignment with all other voices of scholarship represented in the text.

Finally, in both texts the writers argue for their own contribution. In the AL text, the self-evaluation relies dominantly on resources of GRADUATION: FORCE, as the writer positions her contribution in relation to others, for example, closer or more distant in theoretical space. Explicit ATTITUDE is minimal and where it is used, it is depersonalized as appreciation. In the CS text the writer’s own contribution is evaluated dominantly with resources of GRADUATION: FOCUS, as incomplete, or as one of many. Explicit ATTITUDE is more common, and this is often personalized as affect and judgement.

Turning finally to the question of knowledge, the linguistic differences can be interpreted as reflecting differences in an orientation to knowledge, in what Maton (2000a, 2000b) refers to as the legitimation code of the parent discipline. Beginning from an understanding that ‘knowledge claims are simultaneously claims of the world, and by others’ (Maton 2000b: 85, author’s italics), and drawing on Bernstein’s notions of classification and framing (e.g. Bernstein 1990), Maton provides a theoretical framework for comparing the ‘modes of legitimation’ that underlie different disciplines. He distinguishes for example between knowledge-oriented and knower-oriented modes of legitimation. Knowledge-oriented modes more strongly classify and frame knowledge of the world, or ‘epistemic relations’. They focus on ‘specialised procedures’ related to a ‘discrete object of study’. Knower-oriented modes weaken these epistemic relations and instead rely on more strongly classified and framed ‘social relations’, or knowers. They are legitimated by ‘the personal characteristics of the subject or author’ (Maton 2000b: 86–8).

Maton’s framework provides a sociological basis for interpreting the linguistic differences noted in the two texts in this study, as differences in languages of legitimation. The AL text can be seen as relatively more oriented to knowledge. A stronger classification of knowledge is evident in the contested, relatively positioned representations of theory and of the knowledge of the object of study. Representations of knowledge of the object of study are generalized and abstracted from instances. Relatively stronger framing of the epistemic relations is evident in the elaboration of theoretical influences, and in the preference for academic researcher
authorized perspectives on the object of study, and depersonalized evaluations (appreciation) of theory and research.

In contrast the CS text is relatively more knower-oriented. The multiple representations of the object of study, and the uncontested alignment with other scholars represent a much weaker classification of the epistemic relations. On the other hand there is a strengthening of classification of the social relations through participant/observer perspectives on the object of study, personalized evaluations (affect and/or judgement) of theory and research, and impersonation and evocation of theorists (rather than discussion of theories).

If we were to take the two texts analysed here as instances of more generally relevant disciplinary orientations to research and to the construction of knowledge, what potential is apparent for cross-disciplinary dialogue? From a knowledge-oriented disciplinary home such as is applied linguistics, the first step might well be to seek to theorize differences that are evident in practice, as is attempted here. Theorizing has the potential to enable difference to be understood as complementarities rather than perceived as oppositional. However, such a suggestion for theory building and integration is itself reflective of a knowledge-oriented code. What the possibilities are for cross-disciplinary dialogue as seen from a knower-oriented code are as yet unclear, and open for further investigation.

Acknowledgement

I would like to thank colleagues Bev Derewianka, Honglin Chen and Bronwyn James, and Karl Maton from the University of Wollongong for opportunities to discuss these and other texts in terms of representations of knowledge and knowers.

References


**Source texts:**


10 On the ‘Internal Dialogue’ between an Examination Task and Pre-University Students’ Responses

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An analysis of this kind has two aims, one being a higher variant of the other. The first aim is to show why the text means what it does. The second aim, more difficult of attainment, is to show why it is valued as it is – why it is effective or not effective, in relation to its purpose, or as a specimen of its kind. (Halliday 1994: 390–1)

1 Introduction: the conflicting demands of school writing

This chapter is an attempt to fulfil the second aim of the opening quote by Halliday: analysing texts from the point of view of their purpose, and the way they are valued. The texts chosen come from the Swedish (mother tongue) school-leaving examination. In this subject, students are often expected to write argumentatively in terms of so-called ‘debating articles’, texts that they are able to recognize in their cultural environment, for example in newspapers and magazines. However, in the context of the school, the communicative purpose of these texts is a complicated one. When writing a debating article, students are supposed to address an abstract reader of, e.g. a newspaper. At the same time they are quite aware of the fact that the addressee is actually not an abstract, but a well-defined one, i.e. the teacher or the assessor of the task. This may lead to a situation where students experience conflicting demands. Hence, to be on the safe side, they may construe a dialogue with their actual reader, i.e. the writer of the task, instead of writing the expected debating article. The result may be a shift of genre in terms of the overall social purpose of the text, and the language chosen to realize that purpose. In other words, in an educational context, the answers that we, as teachers and assessors, get from the students are very much dependent on the questions that we ask.

As part of recent studies on secondary students’ writing (Hedeboe and Polias 2000; Hedeboe 2002, 2004, 2005), I analysed this dialogic relation or,
in Bakhtin’s, terms the ‘internal dialogue’ (Bakhtin 1981: 283) between the questions, prompts and instructions of a Swedish national examination task and senior secondary students’ written responses to them. I focused on examples of students debating articles which were in fact not argumentative texts. Interestingly, some of these texts even got the highest marks possible. Thus, in the next part of my project, I asked what the students were actually doing, and why their texts seemed to be effective and valuable. I found that SFL tools, especially the extensive work on Genre and Appraisal, helped me to better understand what was going on: this group of students’ texts aligned linguistically to a Gossip genre and a cultural stance initiated by the task (i.e. the supposed actual reader), rather than the genre and stance expected in an argumentative text at senior secondary level. The gossip genre, in this preliminary interpretation, is defined by Eggins and Slade (1997), as an interactive, spoken genre with very specific social purposes: to establish group membership and to maintain a form of social control. However, the gossip genre in my context is not the one expected in private, casual conversation, but rather one that involves a public, unspoken or taken-for-granted ‘community of opinion’ in the Swedish culture, hence construing a presupposed cultural stance. Despite the fact that cultural differences between Anglo-Australian and Scandinavian ways of understanding genres exist, I have found the Australian approach to genre very useful. This is first of all due to the Systemic Functional (SF) model of language and text in context. Hence, also in my project, a description of genre includes a description of how the students construe meaning in a specific context, how they choose language to write successful texts to pass exams.

In the examination, students were explicitly asked to write an argumentative text. While some did, others did not. They gossiped, but were successful inspite of that. This chapter examines why and how the students wrote gossip-type texts when they were expected to write an argument. It further analyses why and how these texts were considered effective and were highly valued. My experience with students, as well as with student teachers and trained teachers, is that they have difficulties recognizing and thus establishing explicit knowledge about genres. In my opinion, knowledge of genres is a necessary framework for teachers and students to work towards specific pedagogical goals. The SF genre framework, in which genre is ‘a recurrent configuration of meaning that matters in the culture’ (Martin and Rose 2003: 206) provides this necessary knowledge.

2 The context

The students’ texts were part of a large corpus, based on the Swedish ‘national test’ (Nationella prov); this is a nationwide test intended to maintain uniform grading across the country and to support teachers in their understanding of text evaluation. The tasks are accompanied by support material and directions for grading. 150 senior secondary schools are selected each year to send in texts and results. Out of this corpus I
picked 92 senior secondary students’ texts, which were the responses to one specific task received in one particular year.

The students were supposed to write a ‘debating article’ on the issue: ‘ni/du’ forms of address (corresponding to the cultural implications of French or German forms of address ‘Sie/du’ ‘Vous/tu’). The task was accompanied by two stimulus texts, the central one being a column by the Swedish author, Jan Guillou. Guillou is a controversial character in Sweden. He is a very popular writer and a skilled journalist. He is famous (i.e. loved and hated) in Sweden for his committed political stories and critical columns in the tabloid newspaper, *Aftonbladet*, and also for his frequent appearance and participation in various TV programmes. He became famous when he uncovered a secret Swedish intelligence service that worked on unlawful registration of individual political opinions. His latest ‘novel à clef’ is about corruption in the assurance business in Stockholm. According to Guillou, the ‘ni’-form of address which is seldom if ever used in modern Swedish society, has had a revival among young people living in the more fashionable, right-wing areas of Stockholm. Hence, among these students (age 17+) who represent various ages as well as cultural backgrounds, the subject might create motivation for debate.

3 The task

The students were given the stimulus texts and the task. The task has three phases, *Orientation*, *Reflection Points* and *Instructions*, and the instruction to ‘support with arguments’ is explicitly expressed in the last stage. But already a preliminary Theme analysis of the task signals another aspect to focus on. In the analysis, the Themes are in *italics*:

**Orientation**

*Jan Guillou* writes in his column in *Aftonbladet* about young people’s ‘ni’-form of address and how that irritates him.

*According to Guillou* the ‘ni’-form of address is used to emphasize class distinction. *He* gives a recipe for how the form of address should be combated.

*In Olle Josephson’s article* the question about terms of address is also treated. *The newspaper* of course receives reactions from its readers.

**Reflection points**

*How* do you react to the ‘ni’-form of address, *and how* do you react to Guillou’s opinions?

*Do you* agree with him

*or do you* get upset *and want* to back out?

*How* do you use the word ‘ni’ yourself?

**Instructions**

*Write* a contribution to a debate*8* to be published in *Aftonbladet*, *present* your own views clearly

*and support* them in detail with arguments.

*Consider* the fact that some of your readers have not read what Guillou has written.

Headline: Own headline.
Focusing on the information in thematic position, it is clear that what the task asks for is an evaluation of a third person, realized in the information structure of the text: not the ideas, not the sharing of experiences, but classifying the world in terms of what people do/want/should/should not be doing. Furthermore, the task seems to elicit not only exposition, but other genres as well. Following Plum (1988) in his investigation of spoken genres, the choice of mood of the interaction in terms of speech function influences interactants’ choice of genre. In other words, genres are construed as answers to ‘narrative’ or ‘expository’ questions or demands. Hence, the task demands at least three different genres:

a **narrative-type initiations ‘tell’**

  How do you react to the ‘ni’-form of address, and how do you react to Guillou’s opinions?
  Do you agree with him or do you get upset and want to back out?
  How do you use the word ‘ni’ yourself?

b **exposition-type initiations ‘argue’**

  Write a ‘contribution to a debate’ to be published in *Aftonbladet*, present your own views clearly and support them in detail with arguments.
  Consider the fact that some of your readers have not read what Guillou has written.

c **gossip-type initiations**

  In the narrative-type questions, the wordings of the task construe a ‘virtual’ dialogue between the writer and reader. Following Macken-Horarik (1996), the text creates in its own semiosis the way in which it wants to be read. It posits an ‘ideal’ reading position for its reader and a set of discourses by which it becomes most intelligible. The students are addressed (‘you’) and asked – or emotionally challenged by means of mental processes – about how they ‘react’; if they ‘agree’, ‘get upset’ or ‘want to back out’. Apparently, the students are expected to ‘get upset’ and to even want to ‘back out’. However, in terms of choices of Appraisal, this behaviour is already presupposed in the Orientation phase. Appraisals are interpersonal kinds of meanings that realize variations in the tenor of a text (e.g. Martin and Rose 2003, 2007). The key resources have to do with evaluating things, people’s character and their feelings. Hence, a characterization of Guillou is expressed as Affect: (‘irritates’), and patronizingly as sarcasm, realized as Judgement (‘gives a recipe’). Ideationally as well as interpersonally and textually, the task foregrounds persons, personal feelings and presumed attitudes. Even though in the final stage the students are instructed as to write a well-supported argumentative text, the wording of the task indicates another purpose. The purpose of the genre is to share a (negative) moral Judgement of a third person (Guillou). Interestingly, in terms of modality, the writer of the task regards these evaluations as self-evident. They express, as it were, an implicit cultural stance. The propositions here are presupposed and barely expressed,
because this common knowledge is shared by the writers and readers and need not be reasserted.

Thus, this cultural stance of the task as well as the social purpose indicated is recontextualized in the students’ responses. The purpose of the gossip genre, to establish group membership and to maintain a form of social control, is maintained in the responses.

4 The responses: the internal dialogue

The first paragraphs of the responses reveal that students find it difficult to decontextualize their texts. They enter the dialogue in a very explicit way, responding to the question ‘do you get upset and want to back out?’ in terms of Graduation, or ways in which the writers raise or lower the force of their opinions (White 2003).

Example 1
(i) I don’t get in the slightest upset by what Guillou is claiming
(ii) Reading Jan Guillou’s column (…) I could not help feeling some distaste
(iii) After reading Jan Guillou’s article (…) I got very upset

Typically they align strongly to the task evaluation (Affect) in terms of repetition and adding words of Graduation (‘(not) in the slightest upset’, ‘some distaste’, ‘very upset’). Also, the responses demonstrate how difficult it is to ‘shift gears’, i.e. to change genre and hence social purpose of the writing, if they follow the instructions of the task. The reason for this is that it involves a total change of focus from the person to the issue in question. Hence, the thesis becomes the question in terms of Guillou’s behaviour or psychological ‘constitution’, and not in terms of his propositions on forms of address:

Example 2
Jan Guillou’s column in Aftonbladet where he presents the ‘ni’-form of address as a big problem, makes me think something like this: How is a human being ‘constituted’ who reacts so strongly to a ‘ni’-form of address?

5 The phases of gossip

Gossip is told dialogically. Hence, in the internal dialogue, the student may expect to have to realize or construe an ongoing negotiated solidarity. Opinions about a third person are often face-threatening, and so there needs to be explicit or tacit approval given for the gossip to proceed. The task questions produce fuel for the gossip. Following Eggins and Slade (1997), gossip develops basically through three stages: The Third Person Focus functions to introduce the third person and to establish the ‘we/us’ versus ‘he/him’; Substantiating Behaviour is the stage where the writer provides evidence or information which enables the readers to make a negative evaluation. The writer describes an event which highlights some departure from normality, and this is the hook on which to hang the evalu-
ation. Hence, the third stage, the Pejorative Evaluation stage, is realized where the outlined events are evaluated and commented on. An optional final phase may follow: a Wrap Up. Thus, the stages of the gossip genre are (^ indicates sequence, () indicates optionality):

Third Person Focus ^ Substantiating Behaviour ^ Pejorative Evaluation ^ (Wrap-Up)

Example 3 shows how an exam response conforms the gossip genre:

Example 3

Third Person Focus Actually I get a little upset seeing what Jan Guillou has written in Aftonbladet (…) about his view of people saying ‘ni’ to people.

Substantiating Behaviour He just writes about what he has heard, he doesn’t think about the elderly people who have been raised to address someone with ‘ni’.

Pejorative Evaluation I think that is a little pathetic of a good journalist like that. Actually I was a little surprised

Wrap-up I think he should feel a little more sympathy

An important point in the description of the function of the Substantiating Behaviour is that it is a stage at the service of the interpersonal. It ideationalizes the interpersonal meanings that are foregrounded in the Third Person Focus and the Pejorative Evaluation phases. In terms of ‘argumentation’ or ‘opinion’, one might say that the Substantiating Behaviour functions as ‘evidence’ to support the ‘thesis’ about the third person’s bad behaviour. The first stage does not develop the opinion or comment on the ideas. The ‘opinion’ serves as an example of the third person’s reprehensible behaviour. Hence, the field of the debate is minimized or reduced to a more uncertain existence in terms of ‘what (he) has written’, or ‘his view’. The following phase also describes Guillou’s behaviour, not his views, represented experientially by ‘empty’ references; the substituted ‘that’ as well is a summing up of unsaid, taken-for-granted information referred to in an exophoric reference. Also, interpersonally, the texts enter the dialogue initiated by the task, e.g. by responding ‘Actually’, ‘a little upset’, ‘just’, ‘a little’, ‘a little more’. Those expressions are ‘intensifiers’ enabling writers to assume shared ground with their readers and stress common group membership (Hyland 1999: 353). In SFL terms they signal a degree of alignment (Hood 2004) with the evaluation expressed in the internal dialogue. The meaning is expressed through the question and the answer: !Do you get upset? Yes, actually I get a little upset!. Relational attributive clauses are chosen to express how the ‘offender’ (Guillou) is behaving badly. And finally, the interpersonal metaphors (‘I think’) are, together with the other cohesive ties, ways of agreeing or behaving in agreement with the community of opinion. These are ways for the student to give an impression of indirectly maintaining social control.
Example 4

**Substantiating Behaviour**

I think Jan Guillou uses *this totally ridiculous discussion* about ‘du’ or ‘ni’ to slander ‘moderates’ and in particular the young moderates.

**Pejorative Evaluation**

Guillou doesn’t know what he is talking about. He is stuck in some sort of mental stone age where things like that are important.

According to White (2003), choices of Engagement account for ‘the ways texts can be seen to negotiate meanings with actual and potential audiences’. All texts reflect a particular ideological position and so enter into relationships of (greater or lesser) alignment with social positions put at risk by the current social context. White’s model thus foregrounds the negotiation in social terms (rather than individual terms): Modals of probability, signals of doubt, caution or insecurity, are seen as positionings in terms of opening up or closing down ‘the heteroglossic space’ (i.e. the space for other voices) in terms of arguability. White identifies several moves of spoken interaction having the discursive purpose of expanding or closing down the dialogic space. Here, in the students’ responses, however, the writers not only close down the dialogic space of the debate; the purpose is rather to disengage or to discontinue interaction about the issue in question. The writers choose to align themselves to the ‘unsaid’, presupposed proposition, not about the issue, but about Guillou. This presupposed cultural stance is reconstrued in the development of the texts.

The meaning construed is the following: ‘I/we don’t have to listen to this! I/we don’t have to enter this totally ridiculous discussion. As every one (of us, e.g. group/party members) knows, he is “stuck in some sort of mental stone age”, etc. Thus, the purpose of the text in terms of genre is not to present arguments for or against a current proposition, not even to close down the heteroglossic space of arguing, but to abort arguing altogether and to use this opportunity to assert a strong degree of alignment to the given opinion community and, hopefully, express and gain social power. Thus, the reason why these students do not engage in argumentative texts about the issue in question is that it goes without saying that they do not have to do so! It even seems inappropriate.

In order to explain why some of these texts are highly valued, despite the replacement of genre, two differently-assessed responses will be analysed.

### 6 Two responses

The writers of the following two responses have chosen the gossiping genre. They both passed the exam, but with a different assessment: Text A *passed* whereas Text B not only passed but *passed with special distinction*. In order to support the analysis of the genre types, I have, alternatively, staged the responses according to a more conventional argument genre alongside the phases of gossip.
Text A *Grow up, Guillou!* below construes a fictional context for a debate (‘Yesterday’), showing an awareness of how important it is to make the text ‘sound’ authentic and alive. However, implicitly, it carries on the internal dialogue with the task. The macro-Theme of the response is staged as gossip: it introduces the third person in relation to ‘I’/‘the rest of us’, and frames the evaluation by leaving out the topic in question entirely, referring to alternatives (‘important topics... really interesting...’). The thesis of the text expressed in the macro-Theme (i.e. the view or the proposition that is going to be supported in detail with arguments) is ‘But yesterday he sank low’. Expressions of the internal dialogue (I/we/you vs. third person) and choices of Appraisal are in bold; choices of Graduation (italics) indicate the degree of alignment chosen by the student. The exophoric references displacing the issue are underlined. Typographically the text shows how the *Substantiating Behaviour* is surrounded by interpersonal expressions of Judgement and Affect.

**Text A**

**Orientation**

Yesterday when *I* read Aftonbladet *I* almost got upset.

**Third person ^ Substantiating Behaviour**

Jan Guillou usually sticks to *important* topics, some which are really interesting for *him* to write about and for the rest of *us* to read about, but yesterday *he sank low*.

**Pejorative evaluation (or Thesis)**

It is such a pity for a good journalist like *him*. *He* described how upset and degraded *he* gets when anybody addresses him with ‘ni’. *He* thinks it is an insulting word and a proof of the great distance between the upper and the lower classes. *He* used the words: *I* never answer letters addressing me with ‘ni’. It is a question of principle.

**Defence**

All *I* can say is: Grow up Guillou! How can anyone say something like that, *I* don’t understand. *He* applies the same yardstick to everybody. The thing *he* wrote about not answering letters addressing him with ‘ni’ seems to be a sign of sheer megalomania.

**Substantiating Behaviour or Issue**

What does *he* mean by that, that a poor auto mechanic is not allowed to express himself the way he wants? What happened to the freedom of speech? Think for yourself *I* mean how offended do you get if an employee at a service station asks you: Do you (‘ni’) want the tank filled?

**Wrap-up OR Recommendation**

All *I* can say is this, drop the topic and write something more sensible instead or have *you* lost the bite?
The ‘space’ between the phases is in fact a space for irony or other kinds of extra-linguistic expressions of Affect and Judgement (e.g. sighs, headshaking.) Here, irony is a special kind of substitute for silence (Bakhtin 1986: 149). ‘All I can say is’ (repeated) is an interpersonal theme signalling a decision for the discontinuation of the debate. Also, in terms of exophoric reference, the elliptic, negatively evaluated (Appreciation) summing up of the field in question as ‘It’, ‘something like that’, ‘The thing he wrote...’, including the rhetorical question: ‘what happened...’ seems sufficient for the social purpose of the text to finally make the personal evaluation. The patronizing questions signal a strong degree of alignment with the task (‘gives a recipe’) and consequently with the community of opinion regarding agreement on the kind of judgement that should be applied to Guillou. He not only needs a psychiatrist to cure his megalomania, he also needs a lawyer! (Martin and Rose 2003: 6211). The Wrap-up concluding the response repeats the process of referring to what cannot and should not be talked about, still giving a little space for an alternative topic (‘instead’) and an implicit Judgement (‘more sensible topic’ – more sensible than what?). Interestingly, the text returns to the confrontation implied in the headline. The commands (‘grow up, ‘drop’, ‘write’), are in fact not recommendations but in-group expressions representing a shared rejection of certain values or modes of behaviour, thus realizing involvement and contact. They represent sarcastic, patronizing evaluations, directed not at Guillou, who is not going to read it anyway, but to group members of the community of opinion, making the offender appear as a child scolded for inappropriate behaviour by someone in authority. Thus, the stance of the text is construed to give the impression of a writer exerting social control as well as belonging to the expected community of opinion. As Eggins and Slade (1997) show, the articulation of the values of the ‘group’ and positioning oneself with status is part of the Involvement associated with group membership. Also Naming or not Naming are mutually accepted representatives belonging to the in-group.

In the analysis of Text B, below, because of space, the longer ‘informative’ passages of Substantiating Behaviour have been omitted (indicated in brackets). The macro-Theme is introduced by a number of presupposition-triggers signalling what the writer expects the in-group position to be. The grammatical metaphor (the ‘hairy chest’s man’s man) scornfully identifies the third person. The Graduation, ‘once again’, also implies the presupposed scorn and hence the irrelevance of the ‘compositions’. The metaphorical use of reported speech makes it easier to, indirectly, express attitude and at the same time introduce an element of irony or parody into the writer’s language (Volosinov 1973: 120). In Text B the reported speech has the purpose of replacing the argument genre with another one: gossip. Important observations here are, as in Text A, the relation between the phases Substantiating Behaviour and Pejorative Evaluation. The marked Theme, ‘In my humble opinion’, is actually mocking a mainstream argumentative approach and replacing the thesis with a Judgement. If the
text is considered argumentative, the Pejorative Evaluation stage expresses the thesis.

**Text B**

**Third Person Focus**

**Substantiating Behaviour**

**OR Introduction**

Jan Guillou, the ‘hairy chest’s man’s’ man, has once again been given space in Sweden’s biggest evening paper for one of his pseudo-intellectual compositions. One of the stupidest ones is titled “Du är inte ni med mig”, and was published on October 6th 97. In it he brings up the widespread bad habit of addressing someone with ‘ni’, as an indication of his own excellence. According to Guillou it is a further mischief originating from the inexhaustible source of stupidities of the political right.

**Pejorative Evaluation OR Thesis**

In my humble opinion Jan Guillou is a dogmatic macho-fool with no root in any reality except the inferiority complex he has created through studies of ‘Fibban’13 and pay-TV after midnight.

**Substantiating Behaviour OR Argument**

Guillou explains that the address form of ‘ni’ derives from tendencies of the Östermalm high society wanting to mark its lofty existence towards ‘ordinary’ people. To say ‘ni’ is to manifest a hierarchic distance downwards, between the addresser and the addressee. The snobbism he accuses – like everything else – the Moderate coalition party of.

**Pejorative Evaluation OR**

The sun is yellow, the sky is blue and Jan Guillou is biased. His bitter generalisations of 25% of the Swedish population are offensive.

**(Substantiating Behaviour OR Argument )**

**Pejorative Evaluation OR**

Restatement of Thesis

Jan Guillou should devote himself to writing his pulp literature and stop disturbing us with his odd political, paradoxical columns. What the hell, Janne. Go shoot a zebra instead!

**(Substantiating Behaviour or Argument)**

**Wrap-up (or Conclusion)**

Jan Guillou! Your arrogant attitude is tiring, just like your narrow-minded political accusations.

In more ‘mainstream’ arguing texts, we would find choices of cohesive ties serving as road markers to build up a discourse representation. In this gossip-type text the references are homophoric (‘the ‘hairy chest’s man’s’ man) and even exophoric (‘Your arrogant attitude’), and the Themes, as
in Text A, signal the discontinuation or abortion of the debate. I also found that the semantic connection between the two stages is characterized by silence or by substitution in the form of a pronoun, hence leaving a space for extra-linguistic reactions of behaviour such as resigned sighing, head-shaking or whatever you expect to find in spoken interaction such as quarrel: the resigned version: ‘I give up’, ‘Why do I have to listen to that’, or the more aggressive version: ‘I don’t have to listen to that’. Choices such as ‘humble’, as with ‘All’ in Text A (‘All I can say’), express a resigned contempt for the third person. The strongest example in the present response is the Pejorative Evaluation beginning with ‘The sun is yellow (…’). The writer is allowed to cry off his commitment or responsibility to the debate. As in Text A, the patronizing, sarcastic confrontation in terms of imperatives and the vocative ‘Janne’, which is normally a pet name for ‘Jan’, but is chosen here as a patronizing and contemptuous expression, is not directed towards the offender but rather towards the members of the community of opinion. Here, we obviously have a special group membership in terms of a political party (the ‘moderates’, the Swedish liberals) that shares the contempt for the socialist, Guillou. Guillou’s position is regarded, not as a position, but as an offence. He is behaving badly, offending either the young moderates or young people or the younger generations, in general. And the louder they shout, the more secure the writer feels in alignment with the social clique that he attempts to represent in his writing.

Still, the question remains: how can students get high marks if it goes without saying that they do not have to enter a debate about the issue? The answer lies in the students being able to gossip ‘at a high level’, so to speak. In Halliday’s terms (1997: 353), their texts belong to the ‘written world’:

The written world is a world of things. Its symbols are things, its texts are things, and its grammar constructs a discourse of things, with which readers and writers (…) reconstrue experience.

A short comparison of the two texts shows the difference between the two written registers.

7 Gossip at a high level

The two texts have several elements in common and several differences as well. These elements can be described in terms of genre and in terms of the three metafunctions:

1) The choice of genre in both texts is gossip in terms of the configurations of meaning: the stages of both texts are Third Person Focus, Substantiating Behaviour, Pejorative Evaluation, (Wrap Up); the Wrap-Up is realized as a fictional confrontation or recommendation in terms of commands to support the Pejorative Evaluation stage and maintain the group membership, i.e. maintain the in-group purpose of patronizing a third person.
2) Ideational metafunction: relational processes (attributive, identifying) are chosen in both texts to characterize the ‘offender’. The ideational is at the service of the interpersonal. Hence, the responders choose to omit or to tone down any logical conjunction between main stages to increase the negative evaluation;

3) Interpersonal metafunction: choices of Appraisal from explicit and implicit expressions of Affect to metaphorical and explicit expressions of Judgement in both texts support the expected social control connected to the In-group.

4) Textual metafunction: textual Themes mark discontinuation; interpersonal Themes tie cohesively to the community of opinion with which the text shares the cultural stance; topical Themes are personal; the sources of identifiability are homophoric or exophoric.

The major differences between the two texts are the following:

- Text A chooses mental processes to state what writer and participants think and feel (‘he thinks’, ‘Think for yourself, I mean’).
- Text B exchanges mental processes for expanded nominal groups: taunting lexis (‘his pseudo-intellectual compositions’, ‘his odd political, paradoxical columns’).
- Text A chooses exophoric reference, thus referring to the context of situation: (‘What he wrote about . . .’).
- Text B chooses homophoric reference, thus supporting the purpose of the genre and the writer’s position as a cultural stance (‘Jan Guillou, the man of the hairy chests’).
- Text A chooses interpersonal metaphor (‘I mean’, ‘All I can say’).
- Text B exchanges interpersonal metaphor for metaphorical reported speech (e.g. the student reports, ‘he brings up the widespread bad habit of addressing someone with ‘ni’, as an indication of his own excellence’, instead of arguing, ‘I think Guillou brings up the ‘ni’-form of address in order to indicate . . .’).
- Text A chooses concrete participants.
- Text B makes extensive use of abstract participants and grammatical metaphor.

Hence, the most obvious result of the analysis regarding the differences between the two gossiping texts is that Text B writes in a more written register. The lexical density is 2.1 for Text A and 7.1 for Text B (in the original Swedish versions). An enumeration of the nominal groups, the nominalizations and grammatical metaphors of the texts show this difference. Nominalizations are in *italics*. The numbers in brackets indicate how many times the choice of a nominal group is repeated:

<table>
<thead>
<tr>
<th>Text A: Nominal groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (9)</td>
</tr>
<tr>
<td>The Evening Paper</td>
</tr>
<tr>
<td>Jan Guillou (6)</td>
</tr>
</tbody>
</table>
He (15)
Important issues
Such a good journalist
An offending word
The elders
A person you hardly know
A poor mechanic
An employee at a gas station

Text B: Nominal groups and nominalizations
‘Jan Guillou, the ‘hairy chest’s man’s’ man
‘Sweden’s biggest evening paper’
‘your narrow-minded political accusations.’
‘his odd political, paradoxical columns’
‘His bitter generalisations of 25% Swedish population’
‘its lofty existence’
’a further mischief’
’a dogmatic macho-fool with no root in any reality except
the inferiority complex he has created through studies of ‘Fibban’ and pay-TV after midnight.’
‘the inexhaustible source of stupidities of the political right block.’
‘the widespread, bad habit of addressing someone with ‘ni’
his pseudo-intellectual compositions.’
‘A magnificent example of rhetorical subtleties’

The exchange of mental processes for taunting lexis and metaphor also adds to the analysis of Text B as elaborated writing. Alternative more spoken choices are in brackets:

Text B: Processes
has again been given space (writes)
brings up (writes)
originating from (because..)
has created (made)
should devote himself to writing.. (write)

8 Conclusion: The questions you ask – and the answers you get
The gossiping genre displaces an expected argument and demonstrates in the linguistic realization of the responses an expression of an in-group, cultural stance. The reason why the gossiping students pass, some even with high marks, despite disregarding the genre demands, is clearly that they align with this cultural stance. But the texts that passed ‘with special distinction’ have succeeded in developing a written register that is highly valued. In terms of literacy, a displacement of a genre involves a total shift of direction regarding the social goal of the text, one that allows students to back out and ignore what they are explicitly asked to do: argue. Apparently, the discourse community does not recognize what the students do and how they go about writing. Christie (2002) discusses similar situations where students are rewarded for adopting fairly orthodox
written registers despite the fact that the teaching, as well as the tasks, initiate spoken, self-expressive texts. She characterizes the pedagogical position as anti-intellectual, because it denies the ways in which significant areas of knowledge are built up. This process of ‘construing the invisible’ (Macken-Horarik 1996) involves an explicit teaching of the potentials of genres and of the grammar realizing those potentials. In terms of pedagogy, knowledge about genres as part of a functional model of language is a rich framework for educators whose role it is to support students’ linguistic development as well as to increase their knowledge of how to write valuable texts. In other words, knowledge about genres makes visible to all parties in the dialogue the relation between the questions you ask and the answers you get.

Notes
1 I thank John Polias for valuable comments and suggestions on a draft of this article.
2 In a Scandinavian context, the problem of the ‘double’ addressee of school or schoolish genres was first discussed in Berge (1988: 81).
3 e.g. Martin and Rose (2003, 2005); Eggins and Slade (1997); White (2003); Hood (2004).
4 Eggins and Slade (1997). In a Swedish context the purpose of the gossip genre, ‘Skvaller’, has been similarly described in sociolinguistic terms by Nordenstam (1998). Nordenstam analyses the function of gossip as the participants’ strategy to establish group identity alongside a strategy to confront authorities.
5 I am inspired by the pragmatic concept ‘cultural standing’ described by Strauss (2004), but reconstrue it in the SFL framework of Appraisal and Stance.
6 All texts included in this article have been translated from Swedish into English. Text A is published in Palmér and Östlund-Stjärnegårdh (2005); Text B (along with A) is part of a text corpus collected at Institutionen för nordiska språk, Uppsala universitet. Östlund-Stjärnegårdh, I comment on a few problems or interesting points in relation to the translation along the way. The typological differences between the lexicogrammar of the two languages do not interfere with my point: to show the pedagogical potential of an SFL genre analysis.
7 The material process ‘back out’ is my translation of the Swedish process ‘säga ifrån’ which is a verbal process; the corresponding English expression ‘cry off’ seems a little too informal here; “säga ifrån’, however, does not have to be verbal. The meaning of the metaphor is connected to the action of discontinuing, quitting or withdrawing from the discussion.
8 A ‘contribution to a debate’ is a genre that is described, but not well-described in the context. Apparently that is why the examination task also instructs the students to write well-supported arguments.
10 The Swedish syntax differs in specific ways from the English, e.g. regarding the Theme position of ‘Actually’ (‘faktiskt’). For studies on this difference see Erman (2000) and Hasselgård (1997). In the present analysis the difference has less importance for my point, which is the contextual reference.
11 Following Iedema et al. (1994), Martin and Rose (2003: 62) divide judgements into two major groups: social esteem and social sanction. ‘Social esteem involves admiration and criticism, typically without legal implications; if you have difficulty in the first area you may need a therapist. Social sanction (…) involves praise, and condemnation, often with legal implications; if you have difficulties in the second area you may need a lawyer’.
12 The meaning is: ‘you are not in a position to address me with ‘ni’, i.e. the more polite form of address. Guillou argues that nowadays this form of address is rather an expression of arrogance.
13 ‘Fibban’ is a porn site.
14 Halliday and Matthiessen (2004: 655): ‘To measure lexical density, simply divide the number of lexical items by the number of ranking clauses’.

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11 A Discourse Analytical Study of Decontextualization and Literacy

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1 Introduction

In Systemic Functional theory, language is seen as a socio-semiotic resource that works through a system of signs and symbols (Halliday 1978). In other words, language forms an interface between social action and discourse semantics, thus not only reflecting, but also constructing social action (see e.g. Martin 1992; Eggins 1994; see also Lemke 1990: 183–213 for an overview of the principles of social semiotics). As an important socio-semiotic resource, language is a system of most probable choices instantiated as texts in situational and cultural contexts for specific types of social action. As a result, language is determined by social action and interpreted against the context in which a specific social action takes place. However, language at the same time determines social action in that it may be used to establish a number of social roles for the interactants in a communicative event. It may, in Lemke’s words, be used to ‘construct the life of a community’ (1990: 183). In this process, context sometimes leads us to choose implicit ways of representing meaning, which may affect text accessibility, and hence cause literacy problems for readers who are not members of the discourse community in which the communicative event takes place.¹

This chapter focuses on how language, instantiated as a description of a laboratory experiment, may construct the life of a scientific research community, and how the linguistic and generic choices reflect the situational and cultural contexts in which it was carried out. As we shall see, one of these choices seems to be implicitness – a feature that interferes with different social actors’ ways of conceptualizing a community. To
explore sources of implicitness I have identified a single sentence in a scientific research article written by a Danish research group. I have then traced the authors’ implicit footprints back to the laboratory account which described the experiment reported in the research article. My study has followed a genre analytical approach, taking inspiration from Martin (1993a; 1993b; 1993c), Christie and Martin (1997) and Martin and Rose (2008). The analysis of authorial traces is informed by Dressen (2002) and adapted to SFL theory through Halliday’s (1994) register dimensions of field, tenor and mode.

The overall purpose of this chapter is to show that a decontextualized communicative event, such as the laboratory account, may be very inaccessible to readers who are not part of the context in which a sequence of actions unfolds. Gradually, when the laboratory experiment is recontextualized (Bernstein 1990), it is at the same time decontextualized as it passes from one written science genre to another – in this case from laboratory account to scientific research article. The implicit features that are typical of these written genres tend to aggravate the literacy problems. Written text, which is by its very nature removed from its original context, has often been described as explicit and self-contained (Barton 1994: 92); however, an analysis of data presented in this paper will demonstrate that decontextualized texts may not be explicit at all, and this may cause literacy problems for readers who, even if belonging to the same discourse community, do not belong to the same community of practice (Wenger 1998).

Thus the utterances that were meaningful to practitioners in the original context lose meaning when they occur in new contexts and are read by a new audience. The decontextualization of highly implicit texts seems to cause literacy problems not only to non-practitioners, but – perhaps more importantly – also to scientists who are familiar with the field, but who do not belong to the research group that carried out the experiment in the first place. Such literacy problems invariably present an obstacle to the replication of scientific research results and therefore raise questions about the design and use of the laboratory account whose purpose is to facilitate replication. Moreover, because the scientific research article also causes literacy problems, and science journalists rely on research articles for their popularized versions of research results to be read by the general public, there is a serious risk of research being misrepresented. Such misrepresentation may reach the general public, with unforeseeable consequences. Collaboration between scientists and discourse analysts may be a way of stimulating awareness of these communication problems and a step towards a solution.
2 Background and theory

2.1 Literacy

Members of different communities use different resources for making meaning, and only if we share the same meaning-making resources are we able to fully read a situation or a social practice, a point of view also shared by Lemke (1990: 186). This has the further implication that if we are able to read a situation or a social practice, we are said to be literate or ‘competent and knowledgeable in specialized areas’ (Barton 1994: 19). Seen from this perspective, literacy is a result of having access to the same contexts. This is an extension of the original definition of the word as literacy originally meant the ability to read and write. In this chapter literacy is to be understood as the ability to read a situation or a social practice, and thus combines Lemke’s and Barton’s definitions of the concept. In my discussion of literacy, I recognize that 1) people’s literacy practices are situated in broader social relations; 2) literacy as a social activity can best be described with reference to the social setting in which the literacy event takes place; and 3) people’s literacies vary according to the institutional settings they participate in, or to what Barton – with his social view of literacy – has referred to as ‘different domains of life’ (Barton ibid.: 34–5; Barton et al. 2000: 8). It is the combination of these aspects of literacy that create a common set of attitudes and values in a discourse community, and which at the same time exclude those who do not share a professional code and whose access is consequently restricted.

Therefore, if we wish to understand how language works in society, we need to understand the principles that underlie the work done by language. This requires various kinds of literacy, including genre literacy, sensitivity to discursive strategies and the ability to ‘deconstruct the already constructed discourses in one’s society’, as Hasan frames it (1996: 377). To my mind, this amounts to being literate in the professional sense.

2.2 Recontextualization

In addition to listing a number of literacy constraining factors primarily related to educational practices, Barton (1994) further discusses differences between spoken and written language (ibid.: 86–91) and challenges the frequently promoted view that written language is explicit and independent of the context of production. I very much agree with Barton that a text can never be context-free and that it will therefore always be interpreted in the light of its new context. A term for this is recontextualization (Linell 1998: 144; Bernstein 1990), which means that a text removed from its original context requires a new context for its interpretation, or as suggested by Linell (ibid.: 144) ‘a piece of discourse cannot be taken out of a given matrix of contexts without changing its interpretations or its potential for being interpreted in specific ways’. In this chapter, I argue that trying to understand a text outside its original context will have an
adverse effect on literacy as I have defined it. In what follows I shall refer
to this as decontextualization, which may then be understood as a label for
one of the literacy constraints affecting a discourse community and its
access to knowledge.

2.3 Genre theory

In SFL, genre is often defined as ‘a staged goal-oriented social process’
(Halliday and Martin 1993: 36; Eggins 1994; Martin and Rose 2003). The
definition presents the generic structure of a text as stages through which
a communicative event passes to reach a goal. Texts are written with a
purpose, and the purpose is achieved through social processes reflected in
genres. This conceptualization of genre is shared by Eggins (1994: 9), who
observes that ‘genre is used to describe the impact of the context of culture
on language, by exploring the staged, step-by-step structure cultures insti-
tutionalize as ways of achieving goals’. More recently, however, Martin and
Rose (2008) have suggested a more comprehensive definition of genre, viz.
‘a recurrent configuration of meanings realized through language and
attendant modalities of communication’. This definition crucially accom-
modates the fundamental idea in SFL that genre draws on language as a
realization of the three register dimensions of field, tenor and mode as
much as it draws on a number of social and cultural factors for its very
existence.

It is these underlying ideas that pave the way for the two pivotal axes in
SF theory, viz. system and structure. System may be illustrated through
various genre system networks on a scale of delicacies, and structure is
accommodated in the notion of ‘generic structure potential’ as suggested
by Hasan (1985). Seen as a system of interaction, a genre system network
(Figure 11.1) will invariably be based on interpersonal relations. Halliday’s
(1994) speech functions, which are categorized as Proposals (offers and
commands) and Propositions (statements and questions) will form a good
starting point for a generic system network allowing for a continuum of
delicacy. On a cline between the two speech functions of Proposals and
Propositions, we have a range of realizations, which, at a more delicate level,
may be either instructional or propositional. If instructional, they may be
either procedures (instructions organized in steps, typically realized as
positive polarity) or protocols (e.g. regulations as to how to behave on a bus,
typically realized as negative polarity). If propositional, they represent a
variety of choices distinguishing action, subsuming recount, and infor-
mation, subsuming description and reporting (see Figure 11.1).

These distinctions are important features of the interpersonal
metafunction and will be discussed in relation to examples of scientific
writing later in this chapter. In addition to the interpersonal metafunction,
however, SFL also accounts for meaning being made through the
ideational and textual metafunctions. The ideational metafunction realizes
the field of a text, also referred to as ideation. When analysing ideation, we
analyse informational content, what kinds of activities are performed and how social actors are classified. The textual metafunction realizes mode. When we ask questions about mode, we ask whether language is written or spoken, how it is organized through cohesive features and rhetorical processes, and how we identify participants and keep track of them (Martin and Rose 2003).

Now, focusing on our texts, we can see how they would fit into a system of genres. Here, we are dealing with a specific discourse community with its social practices and goals, which are achieved through texts, the genres I am examining. We need then to analyse the stages in these examples of social action, and also to study their linguistic features at the level of register to be able to distinguish between different genre realizations. The laboratory accounts discussed here belong to the genre category that Martin (1993a: 192–3) referred to as experiment genres in his research of science textbooks. Experiment genres may be instructional procedures, which are characterized by commands in the imperative mood, or propositional recount genres, which are characterized by the presence of past tense processes recounting past action (see Figure 11.1). Their purposes vary, and while procedural laboratory accounts are intended for scientists who wish to replicate experiments, or for students, recounts function as a kind of diary kept by the individual scientists, helping them to remember how an experiment was carried out. This makes it possible for the scientist to repeat an experiment at a later stage with a change of just one or two variables. Laboratory accounts written up as recounts also provide a basis for writing scientific research articles. Therefore, while laboratory procedures address a multifaceted audience of specialists, laboratory recounts tend to address a rather limited readership that mainly consists of the researcher-author and her fellow-practitioners.
2.4 Authorial traces

Research has shown that, surprisingly, a characteristic feature of the scientific research article seems to be implicitness, which makes it difficult for various social actors to construct what Lemke (1990: 183) referred to as ‘the life of a community’. But how do we recognize information if it is implicit? What are the tokens that would indicate that some action has been going on if this has not been explicated in the text? To address these questions, Dressen (2002) studied implicit tokens of the presence of the researcher-author, referred to as authorial traces, and identified a number of implicit tokens of human presence in field accounts. These were subdivided into 1) strong authorial implicature, such as agential statements of activity or evaluative statements; and 2) disguised accounts of research activity exemplified by indication of human activity through a) nominalizations or material processes, b) locational adverbs of researcher movement, and c) metric, angle and direction measurements (Dressen 2002: 168).

Although focusing on field accounts, Dressen’s study is an important supplement to work by Knorr-Cetina (1981: 4) who suggested that ‘the scientific paper hides more than it tells on its tame and civilized surface’. Both the field account and the scientific paper fall in the category of scientific research writing and are communicative events instantiated in new contexts in which the social actors, who were part of the activity described, have been reduced to what Swales (2004: 77–93) has referred to as a state of silence. Studying ‘traces of the author’ might thus bring us closer to an understanding of the nature of implicitness in scientific writing, and uncover sources of the problems of literacy I have described.

3 Data and methods

To explore implicitness and literacy, then, I analysed data from three sources: 1) the methods section of a scientific research article written by a Danish research group; 2) a laboratory account written by a member of the Danish research group; and 3) external laboratory procedures published by an American research institution, TIGR (The Institute of Genetic Research).

3.1 Contextual information

To clarify the context, the laboratory account and methods section analysed in this chapter belong to the Life Sciences Institute at Aalborg University (LSA). The LSA biotechnology section was established in 1999 with four research groups, one of which is a protein chemistry group. Since 2000 the group has devoted most of its time to researching the potato plant to find out more about its genetic makeup. The overall aim is to improve the starch composition of the potato tuber and to find new proteins and enzymes for medical and industrial uses (Welinder 2000: 1). LSA is not classified as a laboratory that can carry out genetic modification; however,
3.2 Sources of data

In this chapter, my entry point is the methods section of a scientific research article, which can be seen as the interface between activities in the laboratory and the outside world. The methods section is based on laboratory experiments, which are recorded in laboratory accounts. In my research for context in written text, I shall explore aspects of the laboratory account, invoking the notion of intertextuality in order to observe possible traces of human activity and their trajectories into resemiotized states of being. One might assume that because of the close relationship between the laboratory researcher and the account he or she keeps, it would be quite explicit, including strong traces of agency. As we shall see, this does not seem to be the case.

Before proceeding to the analysis, let me introduce the methods section that was based on internal laboratory accounts as well as on various external sources, thus illustrating the idea of intertextuality. From a genre perspective, the methods section is a typical move of the scientific research article, which is usually organized according to the IMRD model (Introduction, Methods, Results and Discussion). (For groundbreaking genre research on scientific research articles, see Swales 1990). From a register perspective, the text reveals highly compressed language, using acronyms and citations (e.g. to ‘Scott et al.’) instead of elaborating a procedural description. It has a running series of verbs (harvested, washed, cut and frozen), offers no statements of purpose or methodological justifications, and focuses on the techniques used rather than on human actors involved in the activities. The style is what Swales (2004: 220) has referred to as ‘staccato’, due to its absence of explanations or justifications. As a result of style compression, the underlying activities are not explicated in the text and hence can only be derived from text-external resources. By following some of the intertextual links indicated in the methods section as shown in Figure 11.2, it was possible to identify two types of sources, which both offered input for the activities going on in the laboratory. The first type of input came from internal sources of which the LSA laboratory
<table>
<thead>
<tr>
<th>Materials and Methods</th>
<th>Internal lab accounts</th>
<th>External sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Field grown potato tuber (var. Kuras) was harvested at the end of flowering, washed in 0.5% sodium dodecylsulfate, cut into pieces and frozen in liquid nitrogen in the field.</td>
<td>22 Aug 2000 Harvesting potato tissue</td>
<td>Scott et al. in Plant Molecular Biology. Report 16: 1998, 4. Isolation of functional RNA from Periderm Tissue of Potato Tubers and Sweet Potato Storage Roots</td>
</tr>
<tr>
<td>2. RNA was extracted from 5 g as described by Scott et al. [12]</td>
<td>a. 12 Jan 2001 RNA Extraction, 2nd time b. 22 Feb 2001 RNA Extraction c. Dave’s buffer</td>
<td>ibid.: 6</td>
</tr>
<tr>
<td>3. Poly(A) mRNA selection (MagneSphere technology, Promega, Madison, WI, USA and</td>
<td>14 Dec 1999 Small-Scale mRNA Isolation, system III</td>
<td>ibid.: 6 (Promega Technical Manual (PolyATract®mRNA Isolation System))</td>
</tr>
<tr>
<td>4. cDNA synthesis (Strategene) were carried out by standard procedures, except for using a different 5’ linker adapter (5’-AATTCGGCTCGAGG)</td>
<td>a. 14–17 Dec 1999 cDNA synthesis protocol b. Overview of libraries</td>
<td>cDNA Synthesis Kit Instruction (Manual from Strategene: pp. 14–17 and 19) ibid.: 5</td>
</tr>
<tr>
<td>5. cDNA was size fractionated by gel filtration and</td>
<td>17 Dec 1999</td>
<td>ibid. :18</td>
</tr>
<tr>
<td>6. cloned unidirectionally into the A ZAPII vector.</td>
<td>Not found</td>
<td>ibid.: 24–7</td>
</tr>
<tr>
<td>7. The resulting DNA was packed into A phages using Gigapack III Gold (Stratagene). From the initial plating the library was estimated to contain 10^5 clones</td>
<td>Not found</td>
<td>ibid.: 26</td>
</tr>
<tr>
<td>8. An aliquot of the library was amplified, followed by in vivo excision of the pBluescript SK (-) phagemid. The average insert size was 1.5 kb. (Numbers added)</td>
<td>12–13 May 2000</td>
<td>ibid.: 30</td>
</tr>
<tr>
<td></td>
<td>Not found</td>
<td>ibid.: 33–4</td>
</tr>
</tbody>
</table>

Figure 11.2 The Methods Section (Crookshanks et al. 2001)
account was the most frequent. In other words, it was possible to trace information back to research activities described in the laboratory account. The second type of input related to external sources, primarily consisting of laboratory procedures made available by chemical industries or other external institutions.

A close reading of Figure 11.2 suggests there is a web of communicative events underlying the very brief passage of text in the materials and methods section. This may be illustrated by looking at step 2, for instance: RNA was extracted from 5g as described by Scott et al [12], which will be the focus of my analyses in the rest of this chapter. To do the experiment, viz. extraction of RNA from potato tissue, the scientist relied on an external lab procedure written by Scott et al. This led to a number of records in the internal lab account (a, b and c under step 2). These records seem to have two functions: 1) to keep track of what was done in the experiment and 2) to keep a record that may be used by scientists (students, lab assistants, lecturers) for educational purposes or for replication. Thus the internal sources – internal lab accounts – rely on external sources for input, which in turn informs the text in the left-hand column of Figure 11.2. On the basis of the example in step 2, we begin to see the extent of information and research activity implicitly involved.

These observations inspired me to look at a third set of data, consisting of ten external laboratory procedures written by the American research group referred to above and published on the Internet. To better understand the lab account genre, I explored its ‘generic structure potential’ (Hasan 1985) by studying how communicative goals may be reached through ‘recurrent configurations of meanings realized through language’ (Martin and Rose, 2008). To do this, I focused on various semantic, linguistic and rhetorical features used to achieve the communicative goals. These were for instance the speech functions, the tenses used and the topics presented under each stage.

4 Analysis

4.1 Generic structure potential

An analysis of linguistic and rhetorical features in lab accounts written by the American research group, referred to in section 3.2, indicated the following generic structure potential, based on Hasan’s (1985) coding system, as elaborated in Martin and Rose (2008):

Example 1: The American lab accounts
(Purpose) ^(Scope) ^(Materials) ^(Procedure ^(warnings))n ^(Timetable) ^(Results)

Key:
(X) optionality
X ^ Y unordered sequence
XY order
[X Y] domain of order
Xn iteration
[X ^ Y]n enclosed elements proportionately iterative
This shows a number of stages that would appear to be optional. These include a statement of the purpose of carrying out the experiment, a stage which provides the scope (delimiting the range of information obtainable through the experiment), a stage in which the materials required for the experiment are listed, a timetable stating when to start and stop the activities required in the experiment and a stage giving the results. The one stage that was found in all of the ten texts was the procedural stage, realized using imperatives (cf. Figure 11.1). In some of the examples, the procedural stage had embedded warnings or notes, also categorized as optional.

For the sake of comparison I looked at lab accounts written by LSA biotechnology researchers, who apparently followed principles different from the ones followed by American researchers. While the American lab accounts were typed out and published on the internet, the LSA lab accounts were handwritten lab accounts, which were kept by individual researchers throughout their term as laboratory scholars. A study of the stages in the LSA lab accounts generated the generic structure potential shown in example 2:

Example 2: LSA researcher’s lab accounts

[Recount ^ (notes) ^ (comments) ^ (time plan)] ^ [Results ^ (comments)]

In the LSA lab accounts, the recount and results stages were obligatory stages in which actions were recounted in the past tense to explain what the researcher did in the experiment. Moreover, the result stage was usually the last stage in an otherwise unordered sequence of stages, which were frequently interrupted by comments and explanations. The LSA researchers seemed to be using the lab accounts as a notebook or diary, and lab records were mixed up with time plans, things to remember or notes to laboratory colleagues who were to continue the experiment at a later stage. However, due to the many similarities between the lab accounts written by the American research group and those written by the LSA research group, I would suggest that lab accounts are a recognizable genre that may then be subdivided into lab procedures and lab recounts on the basis of their use of different speech functions.

4.2 Analysing ideation and identification: a register perspective

Thus far, we have looked at generic staging in laboratory accounts in order to learn about the genre that informs the methods section of the scientific research article. However, because the focus of my study is to explore the nature of implicitness in laboratory accounts compared to the methods section of the scientific research article, it will be necessary to take a closer look at one of the LSA lab accounts from a register perspective. In what follows I shall therefore analyse how meaning is represented through various language resources. Seeing that there is a close relationship between Participants introduced at the ideational level and their tracking
at the textual level, I shall focus my analyses on 1) ideational meaning through a transitivity analysis and 2) identification by tracking participants through authorial traces.

4.2.1 Analysing Ideation

If we compare a lab account for RNA extraction written by an LSA researcher, Mel, with the lab procedure by Scott et al. (Table 11.1), on which she based part of her experiment, and relate the two texts to the second sentence by Crookshanks et al. in the methods section (Figure 11.2), we find that these three texts are strongly related in intertextual terms. The sentence with which we are concerned reads as follows:

RNA was extracted from 5 g as described by Scott et al.

In Hallidayan terms (1994) this sentence is defined as a proposition in the declarative mood with a finite Material Process (extracted) in the passive voice with elided agency. The use of the past tense indicates that the writers recount an extraction activity prior to writing the research article, which by its very nature recontextualizes the activity. When looking at Mel’s RNA extraction account, we find that she begins her text by referring to a ‘protocol’, which turns out to be a procedure recommended by Scott et al. However, unlike Scott et al.’s procedure, which was – in its original version – presented as a list of bullets, each beginning with a Material Process in the imperative mood, Mel’s lab account is best described as a recount of what the researcher did. Some of the differences can be seen in Table 11.1, which shows a transitivity analysis of selected examples from Mel’s and Scott et al.’s texts, respectively:

In Mel’s lab recount the majority of clauses (except for two: grind (ex. 2) and spin (ex. 9)) are Declaratives in the passive voice with verbs in the past tense. Because ellipsis is an all-pervading feature in her style of writing, Goal typically precedes Process with Agency omitted like in 3) Tissue then transferred into 4 × blue top tubes, which in an expanded and more explicit version might read 3a) tissue was then transferred into 4 × blue top tubes by the researcher or perhaps in a more probable version as 3b) I then transferred tissue into 4 × blue top tubes. Variations of this pattern are found in 6) spun for 20 minutes, where both Actor and Goal are elided and in 8) added 20 ml chloroform to each, where Actor is elided. In more explicit versions these two clauses might have read 6a) tissue was spun for 20 minutes and 8a) I added 20 ml chloroform to each. There are of course plausible reasons for not writing these clauses in the active voice, even if this would make for a more explicit text. With the active voice, the agent, in this case the researcher, would be initial point of departure (topical Theme) in every clause, but as noted by Martin (1993a: 194) the text is not meant to focus on the scientist, but on the experimental process of extracting RNA from potato tissue. One might argue that lack of knowledge about the identity of the Actor will not seriously cause comprehension problems to ‘outside’ readers. However, to
Table 11.1 Transitivity analysis of selected examples from two laboratory accounts

RNA was extracted from 5g as described by Scott et al [12].

*The sentence, which is step 2 in the Materials and Methods section: Crookshanks et al., forms the basis of Mel’s lab recount below*

Mel’s lab recount
RNA-extraction, 2nd time

→ As protocol

1) 5 g tissue each in p + m → liquid Nitrogen

2) **Grind** [tissue] in ?? 10 min. **MatProcess** + [Goal] *circumstance*
   (Imperative)

3) [Tissue] _then transferred_ into 4 × blue top tubes
   [Goal] + **MatProcess** (Declarative: *Agency omit.*)

4) [Dave’s buffer] _added_ [Goal] + **MatProcess** (Declarative: *Agency omit.*)
   […]

5) **Left** [samples] _for 20 min._ on ice **MatProcess** [Goal] (Declarative: *Actor omitted*).

6) **Spun** _for 20 minutes_ **MatProcess** (Declarative: *Agency and Goal omitted*).

7) [Samples] _then transferred_ to centrifuge tubes (total 4 tubes).
   [Goal] + **MatProcess** (Declarative: *Agency omit.*)

8) **Added** [20 ml chloroform] _to each_ **MatProcess** + [Goal] (Declarative: *Actor omit.*)
   […]

Scott et al.’s lab procedure referred to in Crookshanks et al (Figure 11.2)

2) **Grind** [freshly-peeled periderm tissue] **MatProcess** + [Goal] (Imperative)

3) **Place** [the resulting frozen powder] in a sterile disposable polypropylene 50 ml tube
   **MatProcess** + [Goal] (Imperative)

4) […]containing 20 ml of Dave’s buffer

5) **Shake** [the tube] vigorously by hand, and **incubate** _on ice for 20 min_ **MatProcess** + [Goal]
   (Imperative)

6) **Clarify** [the lysate] by centrifuging at 10,000 g for 20 min at 4°C. **MatProcess** + [Goal] (Imperative)

7) **Transfer** [the clarified lysate] (15 ml portions) to fresh tubes and **MatProcess** + [Goal]
   (Imperative)

8) **Add** [15 ml of molecular grade chloroform.] **MatProcess** + [Goal] (Imperative)
   […]
a reader who is unfamiliar with laboratory experiments, it is not always clear whether an action presented in the passive voice is an instance of depersonalization or instead a result of an automated process. An example of this may be seen from point 7 in Mel’s account, viz. ‘Samples then transferred to centrifuge tubes’. In theory, the samples might have been transferred to the centrifuge tubes through some automated process, and because of the implicit nature inherent in the passive voice, we are not entirely sure about the identity of the Actor. In Table 11.1, we are reassured of the Actor’s identity only when we look at the corresponding example in Scott et al.’s lab account. This demonstrates that, due to implicit features in grammar, register and genre, non-specialist readers will sometimes have to approach external sources in order to solve comprehension problems. This would not in itself be a problem to ‘inside’ readers wanting to replicate research results. However, as the implicitness of the Actor is recontextualized and mediated between communities of practice and different genres through different modes and across different languages and cultures, the risk of distortion and miscomprehension multiplies, and the lack of information about Goals, as illustrated in Mel’s account in Table 11.1, will tend to aggravate the comprehension problem.

As a further illustration of implicitness, time and place seem to be predominant in both lab accounts. The time component is seen in examples of Circumstance reflecting time in terms of duration (for 20 minutes) and succession (then in examples 3 and 7, the repetition step in example 9, and the step-by-step progression of the two texts). The place component is present in Circumstances of place frequently constituted by prepositional phrases such as place in a sterile tube in example 3 (Scott et al.’s

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9)</td>
<td>2nd Chloroform extraction</td>
<td>(\rightarrow) spin [3000 g] MatProcess (Imperative)</td>
</tr>
<tr>
<td>10)</td>
<td>Added</td>
<td>LiCl. Ratio 5:15 LiCl Isopropanol</td>
</tr>
<tr>
<td></td>
<td>MatProcess</td>
<td>+ [Goal] (Declarative: Actor omit.)</td>
</tr>
</tbody>
</table>

---

**Table 11.1 continued**

<table>
<thead>
<tr>
<th>The sentence, which is step 2 in the Materials and Methods section: Crookshanks et al., forms the basis of Mel’s lab recount below</th>
</tr>
</thead>
<tbody>
<tr>
<td>9) Repeat [the chloroform extraction step.] MatProcess + (Goal) (Imperative)</td>
</tr>
<tr>
<td>10) Transfer [the aqueous phase (10 ml)] to a new tube and mix with 5 ml of 8 M LiCl(_2) and 15 ml of Isopropanol MatProcess + [Goal] (Imperative)</td>
</tr>
</tbody>
</table>

---

RNA was extracted from 5g as described by Scott et al [12].
procedure) or transferred to centrifuge tubes in example 7. In many of the examples the preposition indicates movement of an object from one place to another, which – together with the frequent use of Material Processes of doing – establishes a dynamic linguistic environment for the laboratory activities described in the two texts.

For the experiment, Mel is inspired by a ‘protocol’ recommended by Scott et al. An analysis of the transitivity pattern in Scott et al.’s procedure shows great regularity of style in that in all clauses Material Process is followed by Goal followed by Circumstance. It is interesting to notice how Mel relies on the steps prescribed in Scott et al.’s procedure, although she does her own calculations in terms of proportions and adapts the experiment to purposes negotiated in the Aalborg life sciences research team. Mel’s recount recontextualizes Scott et al.’s procedure in that it represents a new textual moment. Her recount is intertextually intertwined with Scott et al.’s procedure, and there seems to be a dialogue going on between the voices of the two texts. When Scott et al. prescribe a particular action such as 7) transfer the clarified lysate to fresh tubes, Mel replies by describing what she did: samples then transferred to centrifuge tubes. There are, however, some examples showing that although Mel follows Scott et al.’s procedure step-by-step, she uses her own vocabulary when documenting what she does. For example, place the resulting frozen powder in a sterile tube (example 3 in Scott et al.’s procedure) is represented as tissue then transferred into blue top tubes (Mel’s recount), and incubate on ice for 20 minutes (example 5 in Scott et al’s procedure) is resemiotized as left samples for 20 minutes on ice in Mel’s recount.

4.2.2 Analysing identification

As mentioned earlier there is a close relationship between Participants introduced at the ideational level and their tracking at the textual level, and I shall therefore extend transitivity analysis at the ideational level by adding an analysis of identification at the textual level, with the purpose of exploring whether the texts are constructed as coherent patterns of meaning. This involves tracing the Participant roles of the researcher-author, who seems to be an all-pervading implicit cohesive feature in the text. Other possible cohesive features are markers of reference and deictic markers. Interestingly, the author/researcher (Mel) reduces herself to a position as implicit Actor throughout the recount, although she leaves a trace that suggests the presence of a human actor. This observation may be substantiated through five different examples: 1) elided agency in ellipsis (active voice); 2) elided agency in ellipsis (passive voice); 3) material process indicating human activity; 4) implicit instruction signalled through exclamation mark; and 5) indication of measurement. In the first example, the Actor (first person pronoun, I) is elided in clauses in the active voice such as ex. 8 in Table 11.1: Added 20 ml chloroform to each, which is an example of ellipsis. In the second example – also ellipsis – the Agent (by the
researcher) is elided in clauses in the passive voice such as ex. 4 in Table 11.1: Dave’s buffer added. Mel uses ellipsis throughout her lab account, thus avoiding the use of personal pronouns. The third example may be illustrated with reference to the Processes of the text in Table 11.1, which are all Material, indicating processes of doing or, in other words, processes of human activity. Examples are grind, transfer, add, pool, make, remove, spin, shake by hand, renew and measure. The fourth example involves implicit instruction (as protocol!) as seen in Table 11.1, just above the first step in Mel’s recount. Here the researcher instructs the reader – or perhaps herself – to follow a specific lab account. The exclamation mark highlights the importance of the lexical item protocol and marks it out as something to be noticed and remembered by Mel herself. This information is not very helpful to other researchers or outsiders, who may not be aware that the protocol referred to is Scott et al.’s procedure unless they have read the methods section in Crookshanks et al.’s research article. Instruction to an implicit reader is moreover seen in Table 11.1, ex. 1 in Scott’s procedure: Grind tissue for 10 minutes, where the imperative grind gives an instruction to an unidentified researcher, who may be Mel herself or somebody else. A fifth type of implicitness may be illustrated through measurement markers, which indicate that the researcher was actually there to measure out specific proportions of chemicals used in the experiment, as Dressen (2002) has found. In Mel’s recount there are many examples of measurements that refer to both time and quantity such as for 20 minutes (Table 11.1, ex. 5 and 6) or 3,000 g (Table 11.1, ex. 9). However, the actual Actors and Material Processes involved in such measurement activities are hidden from the reader.

Having identified some traces of the researcher-author, let us now try to identify other participants to throw further light on the topic of implicitness. Again our object of study is Mel’s recount shown in Table 11.1. As mentioned earlier, this task may be approached by analysing reference. Interestingly, as I said earlier, there are no personal pronouns to be found in the text, which indicates that the Themes of the texts are never taken up by, e.g. using the personal pronoun, it. The text instead uses repetition of lexical items such as tissue, sample or tube. Differentiation between lexical items such as tube is obtained through Epithets such as new in new tube or Classifiers such as centrifuge in centrifuge tube. Participants may furthermore be identified through deictic markers, but this is not a typical feature in the text analysed. There are no examples of definite articles, which would indicate that the reader has to navigate through the text without markers indicating whether a participant has been mentioned earlier or whether information is treated as given or new. Although most of the examples of implicit authorial traces described under ideation and identification may not cause confusion as to who carries out the research, the passive voice with elided agent may cause certain comprehension problems as indicated above. Moreover, the high degree of implicitness in Mel’s lab recount, in terms of relatively sparing use of reference and deictics as identification
markers, tends to place a heavier burden on the reader, who will then have
to work harder to construct a coherent text.

This would make it more difficult for outsiders to follow Mel’s lab recount
while Mel did not seem to have problems following Scott et al.’s lab
procedure. This may be a result of the apparently different communicative
purposes emerging from the two genres. Scott et al.’s procedure was written
as instructions to be followed by a researcher doing the experiments and
the reader – in this case Mel – was a specialist within the field and was using
the procedure in a meaningful context. Mel’s lab recount described what
she had done and had a different purpose and a narrower audience,
perhaps limited to herself or her close colleagues. The purpose was a
combination of meeting institutional requirements, facilitating replication
of results for herself and her colleagues and avoiding doing the same
experiment twice (personal communication with the LSA research group,
2005). This way, her recount was not intended for a wider audience.
However, in spite of variation of communicative purposes, the two sets of
records still shared the aim of making replication possible – an aim that
might present certain problems, due to the high degree of implicitness
demonstrated above.

5 Conclusion

With this chapter I demonstrate that specific instances of written science
texts are characterized by implicitness in spite of a commonly accepted
assumption that written text is generally more explicit than spoken. By
using a single sentence from a materials and methods section as my entry
point, I traced sources of implicitness in the underlying genre of laboratory
procedures and recounts. I assumed that such genres might be more
explicit than the methods section, due to a shorter distance in time
between the actual experiment and the writing event. However, the
laboratory accounts analysed did not corroborate my assumption, and I
found instead that while the methods section was written in implicit terms,
the laboratory accounts were characterized by even greater implicitness,
seeing that a lot of information was left out and only comprehensible – at
best – to the researcher who did the experiment, or perhaps to her close
colleagues, because of their affinity with the same community of practice.
This result, however, may hardly be seen as a major surprise as the two
types of genres analysed in this chapter – the methods section and the
laboratory account – were found to vary in terms of audiences as well as
communicative purposes. The two genres are therefore intended to
function in two different discourse communities, and implicitness per se
might not cause literacy problems as long as a genre stays under its proper
realm.

My findings would, however, suggest that outsiders, who are professionally
illiterate because they either do not belong to the discourse community or
to the community of practice, would not have access to the information
offered in a scientific research article, even if they had access to laboratory accounts prescribing the experimental activities reported in the methods section. What we see at work here are the constraining aspects of non-community membership. These findings are corroborated by results obtained in research (Lassen, 2006), involving a discussion by a Danish research group of a scientific research article written by an American research group. The discussion demonstrated that the Danish research group were unable to understand all aspects of the research described in the American article, in spite of the fact that both groups worked on similar research, viz. sequencing RNA in potato plants. The American research article and the discussion by the Danish research group thus represented the discourses of two communities of practice, which led to comprehension problems that were mainly caused by implicit information. This means that translators, language editors and science journalists are likely to be deprived of access to scientific information when they translate or edit scientific research articles or write popularized versions of highly implicit articles that are in turn based on highly implicit laboratory accounts. Moreover, science students who are still in the process of being socialized into communities of science practice may find it difficult to carry out laboratory experiments when they have to rely on laboratory accounts that only make sense to a very narrow audience.

Seeing that implicitness is a characteristic feature in much scientific documentation, one may wonder why this is so. One explanation might be that every community of practice competes for a strong position within their field, and consequently do not wish to give away too much, presumably for patenting reasons. Another perhaps less polemic one would be that each community of practice develop its own routines and conventions, which – through language and social practice – determine and are determined by genres. Such conventions at the same time enable and constrain the process of genre literacy. They enable by using a code that is shared by practitioners who find the conventional restricted code more accessible than the elaborated code preferred by non-practitioners (Bernstein 1990). And they constrain by excluding non-specialists as well as researchers who are not members of the community of practice in which the text was written. Such exclusion may have wider implications for the possibility of replicating scientific research results. However, as suggested in this chapter, discourse analysis and deeper knowledge of genre theory may provide some of the answers to a solution to the problem of genre illiteracy. For as demonstrated in this chapter, it is only if we have access to the same meaning-making resources that knowledge of genre theory will help us conceptualize the lives lived in research communities.

Notes

1 For a discussion of discourse community see Swales (1990: 23–7); Barton (1994: 57); Bloor (1998).
For a discussion of the meaning of literacy and how it has changed over time, see Barton (1994).

References


Part III: Corpus Linguistics and Education
12 Exposure, Expectations and Probabilities: 
Implications for Language Learning

Gordon Tucker

Cardiff University

1 Introduction

In their editorial introduction to Chomsky's *On Nature and Language*, Belletti and Rizzi make the following claim:

A very basic fact of language is that speakers are constantly confronted with expressions that they have never encountered in their previous linguistic experience, and that they can nevertheless produce and understand with no effort. (Chomsky 2002: 2)

This is a strong claim, unless, of course, the writers are referring to the fact that most spoken utterances or sentences in written texts are not completely identical in every aspect. What they omit to say is that much of what speakers encounter in the language they hear and read is not novel. Many lexical items and expressions tend to recur regularly in familiar contexts, if we are to judge from the substantial amounts of data found in large language corpora. As a preface to the discussion in this chapter I therefore propose below an alternative version of the first part of Belletti and Rizzi's statement:

A very basic fact of language is that speakers are constantly confronted with expressions that they have encountered, either fully or in part, in their previous linguistic experience.

Whilst I would not wish to include the second half of their claim, namely 'that they [speakers] can nevertheless produce and understand with no effort', it is reasonable to suggest that the alternative version above has important implications for the ability of speakers to understand and use the expressions which they have encountered before. And if we consider this suggestion within the context of language development, in the case of
either a first or a second/foreign language, there are further implications for how we approach this development as language educators.

Language, like other forms of human behaviour, provides the means of reconciling the individual and the social. Creativity is identified with the individual and is the act of being different. Conventionality, on the other hand, is pluralistic, societal. These two facets of human behaviour are continually engaged with one another. The young, for example, in their rebellion against the conventions of their parents’ generation, dress differently, yet end up often dressing identically to their peers and producing new conventional forms of behaviour.

Creativity is also observed in the early linguistic behaviour of young children. Novel expressions are sometimes produced by the child to express those embryonic representations of experience, yet are soon relinquished in favour of the adult forms to which they are exposed (see Clark 1993: 84ff for the principle of conventionality in first language acquisition). Exposure to language, and indeed learning to use language, entails exposure to certain kinds of experience. The language that a child encounters is already some construction or representation of experience. To begin with, its very lexicogrammatical potential constrains the availability of an open-ended set of representations. The transitivity of English categorizes events in terms of both their nature and the inherent participation of things (people, objects, etc.); crying, for example, involves one inherent participant, whereas kissing involves two. In English, grass and information are represented as ‘mass’ entities through their expression as non-count nouns, whereas blade and piece are represented as individual bounded entities through their expression as count nouns.

So whilst there may be lexicogrammatically finite means of constructing experience, leading to an infinite set of potential representations, a given language enshrines, conventionally, through its shaping by multiple generations of users, a reasonably circumscribed set of representations, and it is this set, or a subset of it, to which the child is exposed in coming into the universe of language. Furthermore, despite all that can be meant linguistically, given the full lexicogrammatical potential, the societal demands that are made on language determine, for many aspects of social interaction, what is said in a given context.

The issue of a language user’s (constant) exposure to previously encountered expressions is indirectly raised by Hymes in his discussion of communicative competence. The last of four questions that arise, according to Hymes, in developing an adequate theory of language users and language use is ‘whether (and to what degree) something is done’. Hymes states that ‘[t]he study of communicative competence cannot restrict itself to occurrences, but it cannot ignore them’. He then tempers this statement in the following way:

Structure cannot be reduced to probabilities of occurrence, but structural change is not independent of them. The capabilities of language users do include some
Hymes is writing here in the 1970s, and whilst he does entertain the notion of the existence of a speaker’s ‘(perhaps unconscious) knowledge of probabilities’, considerable evidence, particularly from corpus-linguistic research over the past ten years at least, suggests that he was perhaps underplaying this aspect of communicative competence, and the role of probabilistic knowledge.

Second language learners, particularly those – the majority – whose learning takes place in a formal, institutional context, will not receive the same experiential exposure as first language learners and users. And despite attempts to engage them in appropriate linguistic activity and introduce them to appropriate lexicogrammatical expressions in a systematic way, their exposure to the L2 is unlikely to correspond quantitatively to the relative exposure of those who interact on a day-to-day basis in the L1 context. Furthermore, if probabilistic expectations do constitute part of a speaker’s communicative competence, these will exist initially in terms of the learner’s L1, and will often already be substantially developed, the exception being very young learners. Naturally, a number of expectations may be universal; the 9:1 ratio of clauses with positive polarity and those with negative polarity (Halliday 1992/2005: 91) is a possible case in point.

Contrary to Belletti and Rizzi’s claim above, then, there is mounting evidence that points to the fact that speakers are exposed to significant probabilistic tendencies in the language they hear and this needs to be taken into consideration in terms of their ability to understand and produce apparently ‘novel’ utterances.

2 Diachronic and synchronic exposure

A language user’s encounter with new or familiar linguistic expression is by nature diachronic, over the course of a lifetime, in fact. Many kinds of social encounters are regular and frequent: we engage in greetings and valedictions on a daily basis. Other encounters, such as service encounters, interviews and different kinds of social events in restaurants, educational establishments, pubs, sporting venues, etc. may be less frequent. The notion of ‘constantly encountering’ diachronically is therefore difficult to ascertain both qualitatively and quantitatively without substantial longitudinal studies of the interactive behaviour of the individual language user.

Assumptions are of course made, at least in second/foreign language learning, that certain kinds of social interaction are relatively common and frequent, and as such are the ones that learners are likely to engage in. Thus, teaching material is likely to introduce ‘greeting people and meeting people for the first time’ fairly early on in the syllabus, whereas ‘arranging a wedding or a funeral’ is unlikely to appear at all! Moreover, the more regular and frequent interactive events are associated with greater degrees
of conventional, ritualistic and formulaic linguistic behaviour. And this is the point or at least part of it; the more frequent and ritualistic the form of social behaviour, the more formulaic the language that accompanies it. Yet, it is only part of the point. What I am suggesting is that much of the apparently ‘general-purpose’ linguistic expression that is not genre-specific is equally subject to probabilistic tendencies. There is thus a set of social meanings, conventional ways of seeing the world, that populate the very heart of most social interaction. And this is premised on the claim that speakers, when they endorse a ‘meaning’ and adopt it, are more likely to express it in an identical or closely similar way to the way in which they have regularly encountered it, rather than seek some novel form of expression for it.

Let us now consider ways in which the focus of enquiry can be switched, at least initially, to the linguistic expressions themselves, away from the particular contexts in which they occur, and which, at the same time, offer us some kind of reflection of diachronic exposure. In order to achieve this, substantial amounts of data are required. It is here that the corpus linguistics enterprise comes into its own. Already, existing general language corpora such as the 100 million word British National Corpus (Aston and Burnard 1998) and the 470 million word COBUILD Bank of English (Sinclair 1987a) contain representative samples across a wide range of text-types and sufficient word size to enable reliable research on individual words and expressions. What the switch to the linguistic expression as focus means is that the expression can be observed in terms of its frequency of occurrence. But more than that, the relational tendencies between elements of expressions (when they are multi-item elements) can be ascertained, and it is precisely here that the kinds of phenomena discussed in this chapter emerge. What I refer to here is the probability of co-occurrence of linguistic elements, and by extension the language user’s expectation of the relative likelihood of the co-occurrence.

The corpus can therefore be considered, in some broad sense, the synchronic equivalent or record of the speaker’s diachronic experience of language in use, in the sense that recurrent expressions may be examined and their frequency measured, since all the texts in which they are used have been electronically stored. We must, however, heed Hoey’s caution in respect of the closeness of equivalence between an individual’s personal corpus, as the sum of his or her exposure to language, and the collection of text samples that comprise a language corpus, whatever its size. The former is, as he puts it, ‘irretrievable, unstudiable and unique’ (Hoey 2005: 14). Many corpora are either representative of a range of text-types (e.g. the British National Corpus) or focus on a particular text-type or genre for example, bookshop service encounters (e.g. Gavioli and Mansfield 1992), and as Hoey again points out, both general and specialized corpora represent no actual speaker’s experience (Hoey 2005: 14). Nevertheless, alongside the many lexicogrammatical tendencies that are associated with different registers (see for example Biber 1988; Biber et al. 1999), many
other tendencies have a less contextual basis and may be considered to be part of the general linguistic system, as Halliday argues (1991/2005: 59). The verb *cause*, for example, as Stubbs (1995, 2001) points out, has a strong tendency to co-occur with unpleasant collocates (e.g. *cause* + *trouble, harm, difficulty, problems, cancer*), and although one might find the verb to be used more frequently in medical, scientific or argumentative discourse, there is no evidence to suggest that its negative semantic prosody disappears or lessens in different genres.

The use of large language corpora, then, gives us an important insight into a speaker’s experience of language in use.

3 Probabilistic co-occurrence phenomena

There is now a rich body of corpus-based studies of co-occurrence phenomena within the descriptive linguistics tradition. These include discussions of collocation (e.g. Sinclair 1987b, 1991), colligation, or grammatical collocational frameworks (e.g. Renouf and Sinclair 1991), semantic prosody and semantic preference (e.g. Sinclair 1987a, 1996; Stubbs 2001; Partington 2004) and lexical priming (Hoey 2005). Whatever lexical, grammatical, semantic or other linguistic phenomena emerge from such studies, they have in common their basis in quantitative analyses of corpus data and on relative probabilities of co-occurrence.

The notion of probabilistic grammar has a long tradition in systemic functional linguistics, and is discussed by Halliday as early as 1956, in the context of Chinese grammatical systems (Halliday 1956). Halliday (1991/2005) further discusses the probabilistic nature of grammar, largely based upon Nesbitt and Plum’s (1988) study of probabilities in respect of the clause complex. More recently, since the advent of larger computer corpora, more detailed quantitative studies of probabilities have been conducted, such as Halliday and James’ study of the grammatical systems of polarity and primary tense, testing Halliday’s own hypothesis that options in grammatical systems are either equiprobable (50% / 50%), thus no unmarked term in the system, or skew (90% / 10%), where one term is unmarked (Halliday and James 1993/2005: 96). Such corpus-based work has also informed the assignment of probabilities to the system networks in large systemic functional grammars, such as the NIGEL grammar (Halliday 1992/2005: 80) and the COMMUNAL grammar (Fawcett et al.1993: 116; Fawcett 2000: 288).

Probabilistic grammar has also been a focus of attention within the formal-generative tradition, primarily within the Natural Language Understanding/Computational Linguistics community (Jurafsky 1996; Bod 1998; Manning 2003; Crocker and Keller 2005). Much of this work is concerned with the role of speaker experience, in terms of knowledge of the probabilities of occurrence of grammatical strings, and its centrality to the process of resolving ambiguity in linguistic structure. Bod refers to a long series of psychological investigations that indicate, amongst other
things, (a) that people register frequencies and difference (my emphasis) in frequencies; (b) that previously experienced structural analyses are preferred to analyses that must be newly constructed; (c) that this preference is influenced by the frequency of analyses that speakers make; and (d) that more frequent analyses are preferred to less frequent ones (Bod 1998: 2–3).

Perhaps the most compelling work on speaker expectation, though not adopting this particular term, is Hoey’s recent theory of lexical priming (Hoey 2005). This theory is based upon the observation that words, and the larger expressions in which they are nested, are primed – in its original sense from the field of psychology – to co-occur with lexical, grammatical, semantic and textual contexts (Hoey 2005). As he suggests:

As a word is acquired through encounters with it in speech and writing, it becomes cumulatively loaded with the contexts and co-texts in which it is encountered, and our knowledge of it includes the fact that it co-occurs with certain other words in certain kinds of contexts. (Hoey 2005: 8)

Again, Hoey’s evidence is derived from corpus data, although he makes it clear that the corpus is only suggestive of the primings that constitute part of the linguistic knowledge of each individual language user (Hoey 2005: 14).

4 A worked example of the construction of probabilities and expectations

In order to observe some of the expectations that may constitute part of an English speaker’s communicative competence, we will now consider some of the probabilities involved in a selected stretch of text taken from the COBUILD Bank of English.¹ The text is drawn from a database newspaper article, in which the speaker, Tara James, in commenting on a certain Booth, whom she considers a ‘state scrounger’, is quoted as using the expression ‘I needed to put food on the table’. A fuller excerpt is given below:

Tara, 23, from Newquay, Cornwall, said: “I’ve had a child and only gave up working for a couple of months. I needed to put food on the table for two and the only way to do that was to get off my backside and work.”

We will progress in a linear direction along the highlighted expression above, exploring the probabilities of co-occurrence of some of the items/expressions that constitute it. Although the progression is linear, as it inevitably is both in the production and reception of spoken and written language, we shall not be exclusively concerned with probabilistic expectations that arise in terms of the next item or items. The utterance of a given verb such as needed, even though it is not the first item, triggers expectations about the nature of its subject, which will have preceded it. There is therefore arguably a stronger prediction that needed will have a human
referent as its subject than the prediction that \( I \) will be followed by the lexical item \textit{needed}. The utterance of \textit{needed} will consequently confirm anaphorically the status of the pronoun \( I \).

Importantly, here, as well, we are not concerned with the computational modelling of human parsing processes, although the kinds of observations that will be made in terms of the probabilities of lexical and grammatical co-occurrence are relevant to such models (see Jurafsky 1996; Crocker and Keller 2005). The main purpose of this worked example is to highlight the role of probabilities and consequently expectations that may inform approaches to and materials for language education.

4.1 The initial pronoun \( I \) followed by \textit{needed}

The pronoun \( I \) is directly followed by the main verb \textit{needed}. In a COBUILD sample of 1,000 utterances containing \( I \), only 25 also contained a non-verbal element (not auxiliary, do-support, modal or main verb) directly following \( I \). The 25 instances predominantly involved the Adjuncts \textit{just}, \textit{never}, \textit{actually}, \textit{really}.

This already constitutes a probability setting, in terms of the thematic placement of circumstantial elements within the clause. Rounding up the probabilities to a 4% probability of a circumstance immediately following \( I \), leaves a 96% probability of a following verbal form. Furthermore, only a small range of circumstance types (typically usuality: \textit{never}, \textit{often}, \textit{sometimes} and inferential: \textit{just}, \textit{even}, together with \textit{really}, \textit{actually}) are available in this position.

4.2 The process ‘\textit{needed}’

Although there is no corpus evidence to suggest that \( I \) predicts the process \textit{need}, the transitivity of this particular process does set up expectations. These concern primarily its complementation. As a Desiderative Mental Process (Halliday 2004: 208), it may have both verbal complementation (either \textit{to+infinitive} or direct present participle) or nominal complementation, as shown, respectively, in examples (1)–(3).

\begin{enumerate}
  \item but were long gone by the time the women \textit{needed rescuing}
  \item The surgeons were told doctors \textit{needed to keep} comprehensive notes
  \item Many contestants and several swimmers \textit{needed treatment}.
\end{enumerate}

The alternative options also reflect the role of the Subject of the Process \textit{need} in the course of action that is ‘needed’. Typically, in \textit{to+infinitive}, it is the participant that is expressing a need for her/himself to do something, unless, of course, the second Process is passivized, as in (4), or the Complement clause contains an explicit Subject which is not co-referential to the Subject of ‘need’, as in (5):

\begin{enumerate}[4]
  \item None of us \textit{needed to be convinced} that this was a real
  \item but because he \textit{needed her to understand} there was a higher purpose
\end{enumerate}
The need + verb+ing option, as in (1), always suggests a non-co-referential Subject to the Process, i.e. ‘rescuing by someone else’.

In the case of nominal complementation, the role of the Subject of need is determined by the nature of the Head the nominal group. Here, nominalized forms of Processes (treatment, protection, re-assessment, etc.) suggest a non-co-referential Participant, i.e. ‘for someone to treat/protect/re-assess him’, equivalent to the passive ‘he needs to be treated/protected/re-assessed. However, this is not automatically the case, as (6) illustrates, where an alternative might be ‘needed to rest’, with a co-referential, unexpressed Subject of ‘rest’:

6) Bergkamp needed rest after playing two games a week

Nouns that realize Things (food, plaster, set of tyres, dresser, etc.), suggest an implicit Relational Process, as can be made explicit in examples such as (7):

7) we needed to have a cover centre half

An examination of corpus samples involving the Process need in its past tense form (needed) allows us to calculate the probabilities of the occurrence of each complementation type. Table 12.1, based upon a sample of 1,000 citations of needed from the COBUILD Bank of English, shows that roughly two-thirds of the citations are complemented by a nominal group structure and the remaining third by a verbal structure, including needed + to and needed verb-ing. Furthermore, Table 12.2 shows that in the same sample almost three-quarters of the verbal complementation types are represented by needed to, in which to is followed by an active voice infinitive verb.

There would therefore appear to be a strong probability that needed will be accompanied by a nominal group expression, but, of course, the corpus citations include a whole range of different lexicogrammatical tokens. In terms of identical tokens, we find 16 citations of needed help, for example, and 125 citations of nominal groups initiating with the determiner a, albeit with a wide range of composition in terms of other elements within the nominal group.

With verbal complementation, which accounts for a third of all complementation of needed, only 7.2 per cent does not involve the needed to pattern, and 92 per cent of all verbal complementation involves the infinitive marker to immediately following needed.

Table 12.1 Percentages of complementation types with needed to from 1,000 citations from the COBUILD Bank of English

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ ngp</td>
<td>660</td>
<td>66.0%</td>
</tr>
<tr>
<td>+ to</td>
<td>316</td>
<td>31.6%</td>
</tr>
<tr>
<td>+ verb-ing</td>
<td>24</td>
<td>2.4%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,000</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.3 The process put

The particular co-occurrence of needed to and put is not strongly predicted by corpus citations beyond the colligational relationship of needed + to + infinitive form of the main verb. The selection of put, however, again sets up a number of lexicogrammatical possibilities, in terms of the transitivity of this process type.

In respect of formal co-occurrence, put is associated directly and metaphorically with the notion of causing something to be in a different location. Systemic functional approaches vary between Halliday’s Material Process categorization, involving an Actor, a Goal and a Circumstance of Place (Halliday 2004: 195), and the Cardiff Grammar Relational Process categorization, in which are inherently involved an Agent, an Affected-Carrier and a Location (Fawcett 1987: 157). The Location Participant Role/Place Adjunct is realized either as a prepositional group or as an adverbial group, as in (8) and (9) respectively:

8) they’ve failed to put a note under the door
9) going to put energy efficient light-bulbs in

Place or Location is also a metaphorical source that gives rise to countless expressions in English, often where the metaphor represents, more or less transparently, a ‘state’ of some kind, as in (10) and (11):

10) But Pascal Budin is about to put his neck really on the block.
11) Chris Smith last night appeared to put himself at odds with the Government line

In yet other cases, the metaphorical source, particularly with adverbial particles, has given rise to a good number of phrasal verbs, where the original metaphor is more opaque or unrecoverable, as in (12) and (13):

12) Senor Lopez offered to put the family up at his house.
13) She has to put up with her son David taking the mickey.

<table>
<thead>
<tr>
<th>Complementation Type</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ to + active</td>
<td>234</td>
<td>68.8%</td>
</tr>
<tr>
<td>+ subject + to</td>
<td>9</td>
<td>2.6%</td>
</tr>
<tr>
<td>+ to + passive</td>
<td>73</td>
<td>21.4%</td>
</tr>
<tr>
<td>+ verb-ing</td>
<td>24</td>
<td>7.2%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>340</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 12.2 Percentages of verbal complementation types in 307 citations from the COBUILD Bank of English
Despite the wide range of lexical functions that *put* serves, the structural nature of its transitivity remains fairly constant. In a sample of 1,000 citations based on the node *to put*, only 213, or 22 per cent (excluding 30 citations that were textually or contextual unclear) of the concordances lines showed *put* followed directly by an adverb or a preposition. This means that in 757 (or 78 per cent) of the citations *to put* was directly followed by a nominal expression. The sample contains two citations where *put* is followed by a nominal alone (e.g. *Phil has chosen to put his side and I think he’s*...) together with 33 citations where, in the same sense of 'putting an argument/point of view', the associated adverbial is a manner adverb (e.g. *put it mildly, vividly, bluntly, etc.*)

There is therefore a strong likelihood that when *put* occurs, it will do so in the clausal form: Subject (Agent) + *put* + Complement\(^1\) (Affected-Carrier) + Complement\(^2\)/Adjunct (Location/Place), with the two Participants realized by a nominal group and a prepositional group respectively, for example *to put food on the table*.

4.4 The expression ‘*put food on the table*’

Let us now consider the precise semantic/lexical content of the expression *put food on the table*. We can gauge the collocational strength of the various lexical items that occur in the predominant structural pattern associated with *put*, followed directly by the item *food*, by using the COBUILD collocational grid facility. The collocational grid returns in tabular form the most frequent collocates in terms of a number of item positions to the left and right of the node. On the grid in Table 12.3, the most frequent collocates from one to four positions to the right of the node *put food* are given. As can be seen, in this context, *on*, *the* and *table* are, independently, the three most frequent collocates that co-occur in the first, second and third position respectively after *put food*. So whilst *put* alone does not predict the strong co-occurrence of *food*, once *food* is selected as the Affected-Carrier, there is a strong likelihood that (a) it will be directly followed by *on*, (b) the word two places to the right will be *the* and (c) the word three places to the right with be *table*. This does not mean that *on* is always followed by *the* or

<table>
<thead>
<tr>
<th>put</th>
<th>food</th>
<th>on</th>
<th>the</th>
<th>table</th>
<th>and</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>food</td>
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</tbody>
</table>

Table 12.3 Most frequent collocates of the node *put food*
pay all the bills, and put food on the table? If that’s what you about how we were going to put food on the table," Mr Irvine said. <p> He
In other words, they put food on the table, on top of caring for food that just to put food on the table and paying my bills. I’ll to feed, how’s he going to put food on the table that night? And then you struggle for my parents to put food on the table, and sometimes we had none.
4. <p> Slogging away to put food on the table, racked with guilt, fed up take the American money to put food on the table and rescue the daughter, or of months. I needed to put food on the table for two and the only way to

Figure 12.1 Citations for put food on the table in the Wordbanks corpus

by table, but it does indicate a strong likelihood of all three occurring together.

The multiple collocational strength of put + food + on + the + table is clear from the fact that this six-word sequence occurs nine times in the 56 million word Wordbanks version of the Bank of English, as shown in the concordance lines in Figure 12.1. This suggests that the expression put food on the table is verging on the phraseological, and is, moreover, a metaphor, albeit transparent, with the sense of ‘being able to feed one’s family’.

The total number of citations in a corpus of 56 million words is low, but it should be remembered that we are considering the occurrence of an N-gram (where N=5), with 3 specific lexical items (put, food and table) together with a specific preposition on. Furthermore, supporting collocational evidence from the 100 million word BNC shows that on is strongly predicted as a preposition by the verb put (772 co-occurrences out of 43,339, with a z-score of 50.9) and by the nominal expression on the table (1,667 co-occurrences out of 6,063, with a z-score of 179.6).

5 The functional grammatical profile of table

The final consideration of the selected utterance will focus briefly on the single lexical item table. Whilst studies of word frequency based on corpus findings have for some time now been incorporated in L2 teaching and learning materials (see for example Willis 1990: 46ff) and have also determined to a large extent the organization and ordering of the various senses of words in learners’ dictionaries (Sinclair 1987a: 169), there are other aspects of the behaviour of individual words that need to be considered. Amongst these are the grammatical functions with which they are commonly associated and the contexts for which, in Hoey’s term, they are primed. We have seen, in our selected example utterance that table occurs as the head noun in a nominal group embedded within a prepositional group at Complement/Adjunct in the clause (depending again on the particular systemic functional analysis that is selected – see section 4.3 above). In a corpus-based investigation, 240 citations of the two most
frequently occurring senses of *table*, namely the furniture and graphical representation senses respectively, were categorized according to their grammatical function in the clause in which they occurred. The functions found were (a) Subject, (b) Complement and (c) Adjunct of the clause, and (d) Modifier and (e) Qualifier of the head of another nominal group within the clause. Examples of these five functional environments are given in (14)–(18):

14) The heavy pine table certainly fits the bill, as does the open-plan (Subject)
15) I’ll pull the table back. You see it blends into this carpet (Complement)
16) We used to sit around the table and she used to tell us all these stories (Adjunct)
17) He saw a broken table leg lying near the fireplace (Modifier)
18) With its sharp click, the tiny lamp over the table brought the room to life (Qualifier)

The distribution of the various functions across the sample is shown in Table 12.4.

What becomes immediately clear from these figures is that *table*, in the furniture sense (TABLE 1), appears to be strongly primed for the adjunctival (circumstantial) function, despite the fact that it is used across the range of grammatical functions. This is not an insignificant observation, since it corresponds closely to how human actors interact with tables (e.g. sitting at/around them, putting things on them); tables are much less likely to be the central participants in typical discourse.

### 6 Conclusions and implications for language education

An utterance randomly selected from the corpus can be seen to reflect a good number of expectations in terms of the likelihood of co-occurrence of some or even all of its elements, both in a lexical and a grammatical sense. The brief corpus-based investigation in section 4 indicates clearly that not only are there sets of lexicogrammatical possibilities/options available to language users, but also that not all options are equally probable. Indeed, some are highly likely to be made. Ultimately, this means that certain meanings are more frequently used and encountered than others. But let us be clear. The existence of even strong probabilistic tendencies does not automatically reduce a speaker’s choice. Language users are always free, within the constraints of the language system, to
make whatever choices they wish or need to make. Yet, at the same time, if corpus findings are anything to go by, despite the freedom to choose between options, speakers frequently take the most probable option. And this is self-evident, since it is only the frequently made choice of a given option, as attested in a large corpus, that assigns to it the status of most probable. Much linguistic choice therefore falls between Sinclair’s ‘open choice principle’ and his ‘idiom principle’, where in the first ‘a large range of choice opens up and the only constraint is grammaticalness’ and in the second ‘a language user has available to him or her a large number of semi-preconstructed phrases that constitute single choices, even though they might appear to be analysable into segments’ (Sinclair 1991: 110).

The discussion here has been primarily linguistic, rather than oriented towards pedagogical applied linguistics, and it would be inappropriate for a linguist to suggest anything other than general implications for language education. Indeed, even as linguists, we are only at the very beginning of a comprehensive understanding of the probabilistic tendencies that operate in language use. Arguably, the first task, on the route towards the incorporation of probabilistic expectation in language education, is the production of better, corpus-based descriptions of the language in question. Already, here, comprehensive descriptions such as the Longman Grammar of Spoken and Written English (Biber et al. 1999) have begun to include probabilistic findings on the use of linguistic expressions across registers. And it is only as such descriptions improve in this sense that we can expect language education methods and materials to reflect them.

There is, I believe, little doubt that ultimately teaching/learning materials should attempt to reflect the probabilistic tendencies that are made available from improved descriptions and corpus findings. Individual texts, for example, would both be instrumental in introducing new linguistic material, but at the same time give appropriate exposure to those linguistic forms and meanings that are observed to be frequently encountered in the experience of first language speakers. And this in itself should contribute to the development of foreign/second language learners’ expectations.

There is, of course, a more direct route, and that is the ‘hands-on’ use of corpora in language learning (Aston 2001), which, fittingly, affords the learner precisely the kind of exposure that is otherwise unavailable.

Notes
1 This fairly random selection of text was made on the basis that it contained the lexical item table, which might be considered by most speakers to be a fairly neutral item in terms of probabilistic expectations.
2 The default source of textual examples is the COBUILD Bank of English.
3 This figure excludes examples such as relative clauses where the Carrier

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precedes the verb, as in: ‘set forth a lesson that we are supposed to put into practice’.

References


A contention of a functional view of literacy is that readers use the redundancy in language when reading (e.g. Fries 2008). Redundancy arises as a result of the non-randomness of language: the obvious fact that at very few points in an utterance is it impossible to predict, at least in general terms, what will come next (see Tucker, this volume, Chapter 12). Grammatical conventions suggest that the will be followed by an adjective or noun. Collocational regularities further skew the probabilities of word choice. According to Brazil (1995: 97), at each point in an utterance speakers have available to them an ‘existential paradigm’ consisting of the restricted range of items that are possible or probable at that point. One of the features of language that limits such paradigms is the presence of complementation patterns: sequences of elements that frequently follow specific lexical items and whose choice is dependent on that lexical item.

For example, the phrase His failure, when encountered at the beginning of a sentence, is followed by a to-infinitive in about 75 per cent of instances. What is more, in those instances where there is no to-infinitive, the phrase is anaphoric. In other words, in contexts where a failure is indicated in one sentence, His failure at the beginning of the next sentence is not necessarily followed by a to-infinitive; however in contexts where no such failure has been indicated, His failure is very likely to be followed by a to-infinitive. The two examples below illustrate the two contexts:

1. For too long the First Minister has failed to stamp his authority on the Executive. His failure has not always been his fault.
2. Les Wilson was . . . educated at the local grammar school. His failure to pass mathematics meant that he left without qualifications.

Thus the prediction of a grammatical category, a to-infinitive (and also a semantic one, as the infinitive will indicate something that is desirable,
such as ‘passing mathematics’) is predicated on a lexical choice, the word *failure*, as well as on discourse factors such as the presence of anaphora.

This chapter will argue that redundancy and predictability are consequences of the interaction of lexis and grammar, and will present a view of grammar that is lexically dependent. The ‘pattern grammar’ outlined in this chapter is the result of the investigation of the typical behaviour of thousands of lexical items as demonstrated in a large corpus of English texts. It is, therefore, very much grammatical description from the ‘bottom up’.

2 Corpus linguistics

The field of corpus linguistics incorporates a number of different methodological approaches (e.g. Biber 1988; Sinclair 1991; Nelson *et al.* 2002; Teubert 2005). The view adopted here is sometimes referred to as ‘corpus-driven’, as opposed to ‘corpus-based’ (Tognini-Bonelli 2001), as it attempts to derive information directly from corpora rather than to mediate that information through theoretical categories. Therefore, whereas this approach to corpus linguistics shares many concerns with functional linguistics (Thompson and Hunston 2006), it does not take the concepts of systemic-functional grammar as a starting point. In this section I shall briefly consider the methodology, assumptions and outcomes of corpus-driven linguistics.

The most important methodology in corpus-driven approaches is the investigation of individual wordforms using ‘key word in context’ or concordance lines. Concordance lines show each example of the target wordform from the corpus under investigation together with a few words before and after the target. They remove each example of the word from its textual context (except the most immediate co-text) and bring together samples of language that occur in a number of potentially very different texts. Most concordancing software will allow the lines to be sorted so that the words immediately to the right and/or left of the target word appear in alphabetical order. This allows the ready identification of repeated items in those co-texts and, in turn, the observation of recurring patterns of items. Figure 13.1 shows a sample of 20 concordance lines for sentence-initial *his failure*, sorted so the words appearing immediately to the right of *failure* are in alphabetical order.

As mentioned above, one of the tenets of the corpus-driven approach is that it makes few theoretical presuppositions about language. On the other hand, no method occurs in a vacuum from the point of view of theory. One of the main assumptions of corpus-driven linguistics is that the detailed behaviour of individual wordforms is worth documenting and that this behaviour has a greater importance than is assumed in models of language that prioritize grammatical structure and abstractions from individual instances. A second assumption is that it is legitimate for language description to focus on what usually occurs in a language, rather than to demarcate the borderline between what is and is not ‘well-formed’.
Corpus-driven research has led to a wealth of detailed descriptions of aspects of language use (e.g. Partington 1998; Stubbs 2001; Tognini-Bonelli 2001), with perhaps the fullest being the Collins COBUILD dictionaries written for learners of English. The word-by-word organization imposed by the dictionary format coincides well with the word-focused assumptions of corpus-driven linguistics. The work is not purely practical, however, but has led to advances in theory that increasingly influence mainstream linguistics. Sinclair (1991, 2004), for example, notes that the tendency for words to occur in semi-fixed phrases is not an odd exception to the norm but a regular feature of language, made more apparent when words are viewed in concordance lines. As a result, he has proposed that words do not ‘mean’ by themselves but that meaning resides in more extended phraseologies or ‘units of meaning’. Much running text, according to Sinclair, is interpreted by readers as a series of such phrases, each interpretable as a unit independent of its component parts. Readers, according to Sinclair, operate this ‘idiom principle’ to the understanding of text as a default, resorting to a word-by-word interpretation (following the ‘open-choice principle’) only when the idiom principle does not work.

Hoey (2005), using somewhat different methods but based on similar assumptions, observes even greater regularities of word use in texts; a given lexical item will occur with a frequency much greater than chance in a particular grammatical structure, or in a particular discourse structure. Hoey suggests a concept of ‘lexical priming’, arguing that words are

Figure 13.1 Concordance lines for *his failure*, sentence initial®
‘primed’ by frequent use to occur in some positions vis-à-vis other words, grammar and discourse, rather than others. Readers recognize such regularities because of their individual experience of language; consensus about regularity comes from the shared experiences of education and of the media.

In short, corpus linguistics of the kind outlined here prioritizes the role of lexis in language description and uses methodologies that highlight recurring patterns of lexical use. This, in turn, has led to theories of language that recognize the importance of phraseology, and of frequency of co-occurrence, to language description. These theories tend to blur the boundaries between lexis, grammar and discourse, but one tradition has focused on grammar, proposing a ‘lexical grammar’ (to distinguish it from the ‘lexico-grammar’ of systemic-functional grammar) of English. This will be described in the next section.

3 The development of a pattern grammar

The notion of ‘pattern grammar’ was initiated by Gill Francis and articulated in a number of papers of which the best known appeared in 1993. Francis took issue with approaches to grammar that noted constructions without remarking on the lexical restrictions on them, or that treated classes of items as uniform in their behaviour. Her argument is both with the preferred metalanguage of grammar (for example, the notion of the ‘extraposed subject’) and with the separation of grammar and lexis. Two of Francis’s examples will illustrate her argument. First, she takes the case of ‘introductory’ (or ‘dummy’) it occurring as the object of a verb, in a sequence that might be expressed as ‘verb + it + adjective + that-clause or to-infinitive’. Examples (from Francis 1993: 140) include ‘...find it difficult to explain...’ and ‘... making it likely that...’. Whereas most grammarians of the day are satisfied with noting the relation of these examples to variants without it, Francis suggests that the most important aspect of this pattern is the restrictions on lexis. The verbs, she notes, are usually find and make, with near-synonyms of these also occurring, though less frequently. The adjectives co-occurring with find are a semantically restricted set, of which difficult, hard and easy are the most frequent. With make, the adjectives belong to a set exemplified by clear and likely. (Figure 13.2 illustrates examples of it as object followed by an adjective and an ‘extraposed’ clause, using a larger corpus than that available to Francis at that time. These examples bear out Francis’s observations and show another regularity: the occurrence of ‘find/think it adjective that’ with adjectives such as amazing and fair.)

In another example, Francis observes the very flexible behaviour of possible. Not only does this word occur in examples such as it is possible that and it is possible to, but it is also found following a superlative as modifier of a noun, as in the worst possible outcome, and in the sequence ‘as adjective as possible’ (Francis 1993: 147). Francis notes that giving possible the label
I did my best to make him feel at ease, I felt it incumbent to put questions
to follow an inclusive policy. I found it useful to do so, since mo
so we hit it off immediately. I found it hard at times dealing wit
first two. He was demanding sexually. I found it difficult to meet his nee
We both love walking but sometimes I found it hard to keep up with him.
in Castleford, West Yorks, added: I found it difficult to take in winn
to hide the pain of being outcast that I found it difficult to differentiat
in the horse world. <p> I remarked that I found it amazing that the British
think I’m so heartless? Do you think I found it easy to break it off.
about 14 or 15. I said one day that I found it incomprehensible that the
Trophy against the Continent of Europe. I found it hard to come to terms wit
s rings rather than their cheeks, I found it disconcerting that he har
have killed to get the toys he wanted. I found it hard to try the play idea
plots flourished within the party. I found it disappointing that not on
ministerial group, which I would chair. I made it clear from the start that
I agreed to help wherever I could. But I made it clear I must never jeopard
an hour. Our talks went on for four. I made it clear that any deal would
thought it wrong to own your own house. I thought it wrong to own somebody e
the issue. As I was being forced out, I thought it fair that the ISC shoul
She’s in the kitchen, on the floor. I thought it best not to move her. H
way of changing the world: ‘Even if I thought it important that the worl

Figure 13.2 $I + verb + it + adjective + clause$

‘adjective’ fails to suggest this range of occurrences, as it is shared by no
other words belonging to that class. (She extends this argument in Francis
1994; Sinclair makes a similar point about the unique ‘preposition’ *of* in
Sinclair 1991.)

Francis’ (1993: 143) conclusions concerning the place of lexis in
grammar have remained at the heart of the ‘pattern grammar’ project
throughout its existence:

…we take the view that syntactic structures and lexical items (or strings of lexical
items) are co-selected, and that it is impossible to look at one independently of the
other. Particular syntactic structures tend to co-occur with particular lexical items,
and – the other side of the coin – lexical items seem to occur in a limited range of
structures.

Francis’s ambition was to describe every word in English in terms of the
limited range of structures (or ‘patterns’) it occurred in, and to describe
each pattern in terms of the restricted set of lexical items that occur in it.
The mutability of language, and the creativity of language users, make this
probably unachievable in absolute terms, but to all intents and purposes
Francis’s plan came to fruition with the publication of the Collins COBUILD
English Dictionary (CCED), which listed all the patterns found by lexicog-
raphers for each sense of each headword, and the Collins COBUILD
Grammar Patterns series (Francis et al. 1996, 1998) which listed all the
There are, as the quotation above indicates, two sides to this assertion. First, where a word has more than one meaning, in the lexicographical sense, these tend to be distinguished by the patterns in which the word is found, or by the relative frequency of those patterns. For example, the verb TELL has a number of identifiable senses, each of which is distinguished by an association with a particular pattern (see Table 13.1; sense numbers, patterns and examples from CCED: 1717).

Secondly, the words that occur in a given pattern tend to share aspects of meaning. Given a list of the words that share a pattern, near-synonyms will be noted as well as words which belong to the same general domain. For example, verbs with the pattern V of n include the following (Hunston and Francis 1999: 83–5):

- approve, disapprove
- reek; stink; smell
- tire, weary
- hear; know; learn
- boast; complain; speak; talk

In all, 32 verbs are identified in CCED as having this pattern. Although different researchers would group these somewhat differently, it is a relatively simple task to divide such lists so that a finite number of meaning groups is identified, the words in each group, when they occur in the given pattern, will tend to share aspects of meaning.
pattern, having aspects of meaning in common. Francis et al. (1996) identify four main groups:

1) boast; complain; speak; talk; tell; warn (speaking)
2) approve, (cannot) conceive; daydream; despair; disapprove; dream; repent; think (thinking or having an opinion)
3) hear; know; learn (getting or having knowledge)
4) reek; smack; smell; speak (as in their actions spoke of a return to dictatorship); stink; taste (one thing resembling another)

There is also a fifth group of verbs with this pattern which do not fit into these groups nor form another single identifiable grouping: beware; come; die; dispose; drain; partake; permit; tire; and weary. Almost all patterns are associated with these ‘miscellaneous’ collections of words as well as with the tidier groups; this suggests that the relation between pattern and meaning is by no means deterministic.

This association between pattern and meaning emphasizes the non-random interaction between grammar and lexis. Not only are grammar patterns restricted in the lexical items that occur in them, but those lexical items are circumscribed by the kind of meaning that they have. This view of grammar rejects the notion of an ‘underlying structure’ to a language that exists apart from the language in use. Categories, such as patterns or groups, are the outcome of observations of language use, not the mechanisms which drive that use (cf. Sinclair 1991: 100).

It is not only grammar but also meaning that is located in language in use. Although meaning and pattern are associated, that association is not one-to-one. It is not the case that one meaning has one pattern, or that the patterns of a word can be predicted entirely by its apparent meaning. More important, meaning cannot be pinned down by, for example, sets of binary distinctions, and words do not have immutable meanings as the groupings given above might seem to suggest. The groups are deliberately ad hoc, proposed separately for each pattern. Although some categories re-emerge over several patterns (for example the notion of ‘speaking’ or ‘thinking’ occurs in groups in many patterns), it is not proposed that these categories are somehow semantically fixed. In other words, there are no semantic sets of words in isolation, only of words as they occur in patterns. Using a word in a particular pattern can highlight an aspect of its meaning that remains latent in other patterns. For example, the verb SPEAK is normally associated with verbal processes. When the subject is inanimate and the pattern V of n is used, however, as in their actions spoke of a return to dictatorship, an alternative meaning that is closer to SMELL or TASTE is highlighted. Another example is the verb BITE, which in many contexts would be associated with eating; where the pattern is V n, for instance, it groups with EAT and DRINK. However, when the pattern is V into n, the aspect of meaning highlighted is ‘making a dent or hole through pressure’; Francis et al. (1996: 205) locate it in a group with bore, crunch, dig, drill, eat (as by acid) and sink.
4 Pattern grammar and text

Like all grammars, pattern grammar can be used to generate an analysis of a text, in that the patterns formed by each lexical item can be identified and mapped on to the text. In some ways, such an analysis is less informative than that of many other grammars. A SVOCA analysis will prioritize the functional relationship between two elements of a clause; a systemic grammar will indicate the choices that the clause represents. A pattern analysis on the other hand offers very little in the way of classification of the clause elements. What the pattern analysis does do is to indicate which elements of the clause are dependent on a particular lexical item. It also stresses the linearity of speech or writing (cf. Brazil 1995: 4) by showing how a clause may be made up of a number of patterns, each one leading into the next.

For example, the invented clause *The policy insures the builder against failure to complete on time* may be analysed as in Table 13.2.

The metalanguage used stresses the different relationship that the noun phrases *the policy* and *the builder* have with the verb *insures*, and the relatively peripheral nature of the prepositional phrase *against failure to complete on time*. It also stresses the hierarchical nature of the clause, with the internal structure of the noun phrase *failure to complete on time* being analysed in terms that are different from those of the clause analysis. Analysing the clause as message in systemic-functional terms, in addition, locates this clause within a systematic set of choices in English. It identifies the process (*insures*) as Material (rather than Verbal or Relational, for example) and identifies the semantic functions of the noun phrases in relation to that process: Actor (*the policy*), Beneficiary (*the builder*) and Circumstance (*failure to complete on time*).

What a focus on pattern does, on the other hand, is to identify both the noun phrase *the builder* and the preposition *against* as having been co-selected with, and dependent on, the verb *insures*, while the to-infinitive *to*...
complete is dependent on the noun failure. The second pattern uses the same metalanguage as the first and is sequential to it rather than embedded within it. A pattern grammar analysis of the clause might look like Table 13.3.

It is perhaps worth noting that, although a pattern grammar analysis requires much less interpretation on the part of the analyst than other grammars do, the question of where dependency lies means that the analysis is not purely mechanistic. For example, the two invented clauses:

*He gave a lot of thought to the problem of waste*
*This provides a partial solution to the problem of waste*

Are clearly different structurally but both consist of the same sequence of elements:


According to Francis et al. (1996, 1998), however, the analyses of the two clauses are different. In the first clause, *to the problem* is dependent on *gave*, whereas in the second clause the same phrase is dependent on *solution* rather than on the verb *provides*. In both cases, *of waste* is dependent on *problem*. These analyses are illustrated in Table 13.4.

Analysing text in this way, then, prioritizes two aspects of English: first, the co-selection of a lexical item with its dependent sequence of grammatical elements; secondly, the linear aspect of clause construction. These counter-balancing aspects, and their relevance to literacy, will be discussed further in the next section.

5 Pattern grammar and reading

Grammar patterns constitute one aspect of a significant feature of language: the pervasiveness of semi-fixed phraseologies. Sinclair (1991, 2004) has argued that such phraseologies make up a large proportion of running text. They are exemplified by so-called ‘fixed phrases’, such as *as a matter of fact* or *a matter of life and death*, but also by less fixed sequences that account for larger chunks of text, such as:

Table 13.4 Pattern analysis of contrasting clauses

<table>
<thead>
<tr>
<th>He</th>
<th>a lot of thought</th>
<th>to the problem</th>
<th>of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb.............</td>
<td>noun phrase.....</td>
<td>to noun phrase</td>
<td></td>
</tr>
<tr>
<td>Noun............</td>
<td>of noun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>This</th>
<th>a partial solution</th>
<th>to the problem</th>
<th>of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb.............</td>
<td>noun phrase</td>
<td>Noun ...........</td>
<td>to noun phrase</td>
</tr>
<tr>
<td>Noun ..........</td>
<td>of noun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• it + BE + (just/ largely/ more/ purely/ simply) + a matter of + noun/ -ing clause, e.g. Then it is just a matter of knowing your audience
• it + BE + a matter of + days/ months/ time/ weeks + before/ until + clause, e.g. it would only be a matter of time before someone was killed
• negative + matter + wh-clause, e.g. No matter what anyone says...
• it + BE + simple/ easy + matter + to-infinitive, e.g. it’s a simple matter to take the number of users and...

Grammar patterns contribute to this chunking; this is particularly apparent in the case of patterns with a relatively large number of elements such as:

• V n n that, e.g. I’ll bet you my next paycheck he’ll be home before bedtime...
• V n to n, e.g. chose to limit normal membership to licensed physicians.
• poss N be that, e.g. My advice is that we appoint someone...
• it v-link ADJ to n that, e.g. It was obvious to me that Mary needed...

Sinclair (1991: 110) further argues that decoders of speech or of writing tend to assume that meaning is to be found in such chunks taken as a whole, rather than in the individual words that make them up. He describes this as operating the ‘idiom principle’ of language. Only when such an interpretation fails will language users fall back on the ‘open-choice principle’ and decode an utterance in terms of its constituent grammar and lexis alone. It is in this way, Sinclair (1991: 104) argues, that ambiguity in naturally-occurring text is largely avoided. Hoey (2005) adds that speakers, where they apparently have a choice in phrasing something, appear to avoid phraseologies that would increase ambiguity. To take a somewhat frivolous example, the venerable institution the English Folk Dance and Song Society could equally well have been called the ‘English Folk Song and Dance Society’, but song and dance is most typically used to indicate an irrational fuss being made, as in:

Why should he make a big song and dance about being born again?
Sometimes she just wants to do her house up and is making a song and dance to get mum out of the way.

Reversing the binomial avoids any risible ambiguity.

More seriously, Ito (2004) offers evidence that where a verb is followed by a that-clause, the proportion of instances where the word that is retained in the clause (e.g. He found that it was broken as opposed to He found it was broken) is higher in those cases where omitting that might lead to even temporary ambiguity. For example, the invented sequence they found the man could be part of any of the following patterns:

• V n prep: They found the man on the river bank.
• V n adj: They found the man interesting.
• V n n: They found the man a new home.
• V that: They found the man was in fact the King of Norway.

According to Ito, where the subject of the that-clause is a full noun phrase, as in the case above, the word that is more likely to occur. In other words,
the more likely version of the final example above is They found that the man was in fact the King of Norway. When the subject is a pronoun such as he, however, so that pattern ambiguity does not occur (They found he... could not be part of They found he interesting and so on), the word that is more likely to be omitted.

Fries (2008) spells out the implications of this for the reading process. Patterns, he suggests, contribute to the natural redundancy of language, a redundancy used by readers. He argues that if readers really decoded each word independently, as suggested by some researchers, they would be faced with enormous amounts of ambiguity in even the simplest sentence. However, if phraseology is taken into account, ambiguity is reduced to practically nothing. The contribution of pattern to this phenomenon may be illustrated by Table 13.1 above: although the verb TELL has at least six distinguishable senses, the phrases tell...that, tell...to and tell what each prioritizes one sense over the others. In addition, pattern offers help to readers if they encounter new words or, more likely, words used in new ways. For example, even if a reader has never encountered the verb SHARE meaning ‘tell someone about a personal experience or feeling’, a sentence such as Later she shared that during spring break she had gone to the beauty parlour to have her perm and as she sat there waiting it came to her that... can easily be interpreted as describing what someone said because of the use of the pattern V that. Fries uses evidence from miscue analysis to support the contention that good readers focus on the lexical and grammatical context of each word, or rather, that they regularly process units longer than a word. Thus, Sinclair’s argument about what ordinary language is like, and Fries’ argument about how ordinary readers read, coincide.

Although language decoding does not proceed word by word, it is nonetheless a broadly linear process, and here again there is a continuity between observations of what language is like – patterns follow one another as a word used as part of one pattern triggers a pattern of its own – and the reading process. Brazil (1995) argues that a linear view of language is beneficial to the understanding of speech, which is subject to real-time processing, but as suggested above it is also useful in accounting for the lexis-grammar connection in written language too.

6 Pattern grammar and pedagogy

To this point, pedagogic applications of patterns have focused mainly on reference materials and on the importance of pattern to accuracy and fluency in the speech and writing of learners of English. In dictionaries, indicating the patterns associated with each sense of each headword arguably gives the user more useful information than does the more traditional annotation of ‘transitive verb’ or ‘countable noun’ and so on (Hunston 2004). Grammar books that list the words found with each pattern illustrate the range of meanings identified with each (Francis et al.
1996, 1998). Learners of English may find both kinds of reference book useful in showing correct uses of English and, by implication, incorrect uses (*suggest* is followed by a that-clause but not by a to-infinitive), and also for extending knowledge of a word (e.g. *angry*) to knowledge of an extended phrase (e.g. *angry with someone for doing something*).

Suggestions for teaching patterns have focused on ‘consciousness raising’ (e.g. Willis 2003). Willis argues that encouraging learners to identify patterns, and other multi-word units, in naturally-occurring text will assist them to produce such patterns correctly and will enable them to make sense of the complex use of prepositions in English. He suggests a number of exercise types that are designed to achieve these goals (148–60).

The application of such consciousness-raising to the teaching of reading has not yet, to my knowledge, been made explicit. It seems reasonable to suppose, however, that awareness of pattern could facilitate reading. Identifying chunks of text that form a single pattern and that are to be interpreted as a single unit encourages the reader to look beyond a word-by-word approach to the text and to expect meaning to be found in longer sequences. It could be argued that the units formed by patterns constitute an intermediate focus between top-down and bottom-up approaches to processing a text.

7 Conclusion

In this chapter, a view of language has been presented which depends on the observation of large amounts of language displayed in such a way as to facilitate the perception of recurrent patterning. Although that patterning has many aspects, one which is particularly relevant to the analysis of text is ‘pattern grammar’. Pattern grammar isolates the sequences of elements that regularly follow (or, in some cases, precede) given lexical items. Patterns can be demonstrated to be associated with meaning, and it is argued that patterns thereby contribute to the redundancy of naturally-occurring text. Patterns also contribute to two complementary aspects of text: it is composed of semi-fixed chunks rather than of individual words, and those chunks overlap sequentially. Mapping patterns on to running texts shows both how the text is tied together (a single pattern may account for a very long sequence of words) and how it is composed linearly rather than hierarchically (one pattern leads into the next, that one into the next and so on). Most of all, pattern grammar prioritizes the necessary interaction between lexis and grammar.

The notion of patterning is important to theories of reading because it adds detail to the hypothesis that readers naturally utilize the redundancy in language, and that they process words-in-context as a matter of course rather than as a matter of last resort when the processing of individual words becomes difficult (Fries 2008). The more we see the pervasiveness of language patterning, as illustrated through concordance lines and other...
corpus methodologies, the more reasonable the notion that ‘reading is a process of creating meaning in some context’ (Fries 2008: 55) appears. Indeed, it would seem that to follow a word-based view of reading would necessitate arguing that reading is a process independent of, and running counter to, what we know about how language works.

Notes

1 Information from the Bank of English, a reference corpus of (in 2005) 450 million words of written and spoken English, owned jointly by HarperCollins publishers and the University of Birmingham. Specifically, out of 77 instances of sentence-initial His failure, 57 are followed by a to-infinitive.

2 The symbol <p> indicates the start of a new paragraph. In about 12 per cent of instances where His failure is sentence initial it is also paragraph initial.

3 For reasons of space, patterns are coded using abbreviations of word or phrase classes. For example, ‘n’ stands for either ‘noun’ or ‘noun phrase’, as appropriate. The abbreviation relating to the word to which the pattern belongs is capitalized. For example, in the example this gave me the idea that..., the pattern of gave is represented as V n n and the pattern of idea as N that. In the first of these patterns, ‘n’ means ‘noun phrase’; in the second it means ‘noun’. In the first pattern, ‘v’ is capitalized; in the second, ‘n’ is capitalized.

4 SVOCA is the traditional acronym for the analysis of clause using Subject Verb Object Complement and Adjunct.

5 Patterns and examples taken from Francis et al. (1996).

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