

# 4 Research discourses

An important thread of the three previous chapters is that academic discourse is the basis of all university activity: the means by which institutions legitimate knowledge, reward success, regulate admission, control membership and induct novices. Only by writing and speaking can academics and students get feedback on their work, earn respect for their ideas and progress in their careers. The main business of the academy, however, is to produce knowledge, and the genres which contribute to this carry the greatest prestige and have received the greatest attention from scholars.

Research discourses have evolved for functional reasons and have accrued considerable status as a result (Halliday and Martin, 1993). They are, in addition, associated with power in Western cultures because of the control they provide over our physical and social environments. The success of academic, and particularly scientific, representations of reality dominates the ways we understand the world and underpins the technical and bureaucratic practices at the heart of modern capitalism. More immediately, they influence the lives of countless academics as universities around the world now require staff to present at international conferences and, more crucially, publish in major, high-impact, peer-reviewed Anglophone journals as a prerequisite for tenure, promotion and career advancement. This chapter explores key aspects of these discourses, focusing mainly on articles and conference presentations but concluding by briefly looking at a number of other genres.

## 4.1 The research article

Despite competition from electronic publishing alternatives such as e-journals and personal websites, the research article (RA) remains the pre-eminent genre of the academy. Beginning life in the form of the letters published in *The Philosophical Transactions of the Royal Society* in the mid-seventeenth century, the RA is now not only the principal site of disciplinary knowledge-making but, as Montgomery (1996) has it, 'the master narrative of our time'. One reason for this pre-eminence

is the value attached by the scholarly establishment to the processes of peer review as a control mechanism for transforming beliefs into knowledge. Another is the prestige attached to a genre which restructures the processes of thought and research it describes to establish a discourse for scientific fact-creation. Language becomes a form of technology which attempts to present interpretations and position participants in particular ways as a means of establishing knowledge. Consequently, the RA is a genre which has generated such a volume of research that it defies easy summary. In this section, however, I will sketch an outline of what we know about this extraordinary genre.

### *i. Review and revision*

One prominent feature of the RA is that it is the outcome of a prolonged, and often tortuous, writing and peer-review process. A manuscript develops slowly through several drafts with inputs from colleagues, language specialists, proofreaders, reviewers and editors, what Lillis and Curry (2006) call 'literacy brokers'. This often frustrates writers, but contributes to the final polished product shaped to the cognitive and rhetorical frameworks of a disciplinary community. The brokering of published research therefore mediates academic cultures as well as texts. The process not only manages the quality of published research, but also functions as an apparatus of community control by regulating appropriate topics, methodologies and the boundaries within which negotiation can occur. For newcomers to a discipline it is both a crucial situated learning experience and a rite de passage that marks the route to full membership.

Myers (1990) and Berkenkotter and Huckin (1995), following scientists through the review process, illustrate the importance of reviewers' comments in guiding writers to rhetorically accommodate their laboratory activity to the concerns of the discipline. Through reviewers' recommendations to modify the strength of their claims, provide propositional warrants, and establish a narrative context through citation, they found that writers gradually integrated their new claims into the weave of disciplinary relevance and prior work. This process indicates that new facts are not added piecemeal to the heap of existing knowledge, but are the extension of an ongoing conversation among members, conducted in a shared 'theory-laden' language and particular patterns of argumentation. Both Myers and Berkenkotter and Huckin therefore see academic writing as a tension between originality and deference to the community. So while Berkenkotter and Huckin's case study subject sought to gain acceptance for original, and therefore significant, work, for instance, the reviewers insisted 'that to be science

her report had to include an intertextual framework for her local knowledge' (p. 59).

The challenges of writing for publication are daunting to all academics, particularly in today's competitive climate where journals in some fields have rejection rates of over 90 per cent. One of the most central causes of difficulty for novice writers, particularly those working outside the metropolitan centres of research, is their isolation from current literature and the demand that they situate their work in a rhetorical tradition. Non-Native English scholars themselves, however, often cite their lack of language abilities as a problem. About half of Flowerdew's (1999) 585 Hong Kong academics, for example, reported that they felt at a disadvantage compared with Native Scholars (NSs) in this area. This is clearly illustrated in the fact that many of while St John's (1987) sample of Spanish researchers often resorted to translation from Spanish when revising papers for publication.

Research into the writing processes adopted by novice Non-Native English Speaking academics also suggests what a laborious task writing for publication can be. Li (2006), for example, tracked a Chinese Doctoral student through six drafts and several painstaking resubmissions guided by supervisors, a journal editor and reviewers before her paper was finally accepted. Gosden (1996) also found considerable text revisions by seven Japanese postgraduate students. In response to reviewers' comments they made over 320 changes between the first draft and published paper, changes which Gosden sees as a movement towards more mature writing characterized by a greater range of cohesive devices, explicitness, hedging and subordination. Not is the process made easier by what Flowerdew and Dudley-Evans (2002) found in their study of editorial correspondence, which is often opaque to authors due to poor structuring and indirectness.

Essentially, revisions represent a reworking of the rhetorical goals of a paper to more clearly meet the perceived needs of readers, and this is tricky for all novice writers irrespective of their first language. Swales, in fact, takes the view that the most important distinction in publishing is not between Native and Non-Native English speakers, but

between experienced or 'senior' researcher/scholars and less experienced or 'junior' ones – between those who know the academic ropes in their chosen specialisms and those who are learning them.  
(2004: 56)

Participation in the publication process, in fact, contributes to learning these academic ropes. Following situated learning and social constructionist theories, the redrafting process can be seen not just as the transformation of a text, but also the apprenticing of an individual writer into the knowledge constructing practices of a discipline.

The metaphor of 'apprenticeship' has been used to describe this process, although Lave and Wenger (1991) talk of 'legitimate peripheral participation' to conceptualize learning as engagement in the sociocultural activities of communities of practice. In other words novices learn by doing; gradually developing an academic identity as they come to write and think in the ways of their discipline under the guidance of more experienced peers, and the comments of editors and reviewers (Casanave and Vandrick, 2003). When considering writing for publication, this apprenticeship involves a careful negotiation with two principal audiences: the journal gatekeepers who will judge the paper as ready for publication and the community of scholars who will read the finished paper and hopefully cite it and use it in their own research.

### *ii. Novelty and relevance*

As we have seen, a key part of the textual reshaping of an RA through peer review involves situating local research in the broader concerns of the discipline, managing innovation for a target community by establishing explicit intertextual links to existing knowledge. To be new, work must recognize the knowledge which has already gained consent and against which it makes a claim for change. Novelty thus acknowledges what has gone before and builds on the field's organizational structures, beliefs and current hot topics. Topics, in fact are more than a research focus: they represent resources of joint attention which coordinate activities and mark co-participation in communities. Selecting a topic and arguing for its novelty and relevance is thus critical in securing colleagues' interest and in displaying membership credentials. There is a certain marketization involved in this, a promotion of oneself and one's research which is analogous to the promotion of goods, thereby borrowing from the discursive practices of a wider promotional culture (e.g. Fairclough, 1995).

The marketing of an RA begins with the **abstract** where writers have to gain readers' attention and persuade them to read on by demonstrating that they have both something new and worthwhile to say. While often considered as merely a 'representation' (Bazerman, 1984: 58) or 'summary' (Kaplan *et al.*, 1994: 405) of the full paper, a study of 800 abstracts from journals in eight disciplines (Hyland, 2004b) shows things to be more complex. The abstract, in fact, selectively sets out the writer's stall to highlight importance and draw the reader into the paper. As we might expect, there are disciplinary differences in this process. The hard knowledge abstracts tend to stress novelty and benefit, while writers in the social sciences largely draw on the notion of importance

to promote their work. Novelty is obviously a *raison d'être* of science fields where constant innovation and progress are expected and practitioners look for new results to develop their own research. Examples like these are common:

1. The assays presented herein illustrate two novel approaches to monitor the intracellular dynamics of nuclear proteins.  
(Biology)

A new design for a minimum inductance, distributed current, longitudinal (z) gradient coil, fabricated on the surface of an elliptic cylinder is proposed.

(Physics)

Engineers, on the other hand, underlined their practical, applied orientation by combining novelty with the utility of their research to the industrial world:

2. The new model gives significantly improved predictions for both liquid holdup and pressure drop during gas-liquid, stratified-wavy flow in horizontal pipelines.

(Mechanical Engineering)

This paper answers these questions by developing an integer nonlinear programming model and solving it using a very efficient dynamic programming approach.

(Electrical Engineering)

A great deal of rhetorical effort also goes on in the **introduction** of an article where writers seek to create a research space to justify the importance of their work. This ecological metaphor owes its popularity to Swales who famously suggested a model of article introductions consisting of three sequential rhetorical moves in which writers

need to re-establish in the eyes of the discourse community the significance of the research field itself; the need to 'situate' the actual research in terms of that significance; and the need to show how this niche in the wider ecosystem will be occupied and defended.

(1990: 142)

Like plants competing for light and nutrients, the RA competes for a research niche and an audience. This is largely achieved in the introduction through a text which attracts readers by foregrounding what is already known, then establishing an opening for the current work by showing that this prior knowledge is somehow incomplete, as here:

3. Research into public drinking in natural settings has been conducted for many decades since the early observational

study of a public house in an English industrial town (Mass Observation: 1943). However, few studies have focused specifically on violence.

(Sociology RA)

Stiffened planes are commonly used in many engineering structures (e.g. bridge decks, ship superstructures, aerospace structures, etc). Despite their wide application, little is known about their behaviour.

(Mechanical Engineering RA)

The second sentence in each of these examples therefore sets up the basis from which the novelty of the writer's work can be understood.

Claims for novelty are thus assembled by reference to what social communities know and what they believe is worth knowing. This is more carefully elaborated in the **literature review**, which seeks to justify the value of the current research and show why it is distinct from what has gone before (Kwan, 2006). Here writers construct a story for their study, persuading the reader that some organizing principle links their work into a coherent chain of disciplinary activity. Similarly, the **results** of the study, often thought to be a bland list of findings, actually contribute to the persuasive unity of the paper. Rather than stepping back to allow results to neutrally speak for themselves, writers urge the value of their research onto the reader through a series of rhetorical moves designed to justify the methodology and evaluate results (e.g. Ruiying and Allison, 2003).

In many science papers a **methods** section is often inserted between the introduction and results and this can be more or less succinct or elaborate, depending on readers' assumed familiarity with the procedures and the extent to which they are likely to accept them. While data collection is rarely straightforward, reports typically omit reference to unreliable equipment, sub-standard materials, uncooperative participants, and false turns to present a smooth and unproblematic process which is simply labelled rather than explained. Methods are often taken on trust in a way that can defy obvious replication, as in this example:

Each FID was baseline corrected and apodized with a 750-Hz exponential before being Fourier transformed. In order to perform the curve fitting, the spectra were fitted with a Gaussian lineshape, and the peak intensity was recorded. The spectral processing and analysis were performed with the routines of NMRI. The curve fitting was performed using the Levenberg-Marquardt method.

(Physics RA)

Indeed, the methodology section is increasingly downplayed in science RAs, frequently printed at the end of the article in a smaller font to save space.

The current work is most vigorously ‘sold’ in the **Discussion** section. Here previous research is treated as background and introduced to compare, support or invigorate the new claim with opposition, as the writer fends off counterclaims to celebrate the new (Lewin, *et al.*, 2001). Berkenkotter and Huckin (1995) also argue that there is an active promotion of news value in the discussion, a finding confirmed by Swales and Luebs (2002) in psychology articles and apparently common in other disciplines, as we can see in these examples:

4. These results are important with respect to the physiological roles of the different proteins studied here.

(Biology RA)

Ours is the first research that offers evidence that word-of-mouth about forgone alternatives can affect satisfaction with the chosen alternative.

(Marketing RA)

We offer a new way of theorising ageism itself, as a contingent and negotiated interactional practice.

(Linguistics RA)

Less obviously, perhaps, something of this promotionalism is captured in the increased use of argumentation, personal involvement and evaluative commentary that we tend to find in discussions. One example of this is authors’ preferred theme choices, or what serves as the starting point of the message. Compared to other parts of the article, themes in discussion sections have been found to express the author’s efforts to persuade readers by having a high proportion of interpersonal themes realized by mood and comment adjuncts (Gosden, 1993):

5. Interestingly, a decrease of the  $a$ , values was observed again at higher light intensities (about  $1200 \text{ pmol m}^{-2} \text{ S}^{-1}$ ).

(Electrical Engineering RA)

It is possible that a large number of the barristers who said that they did not think computers were relevant to their work, actually did not know how to use them either.

(Sociology RA)

It is thus clear that the formation of central bursting in the extrusion process is controlled by the growth of voids.

(Mechanical Engineering RA)

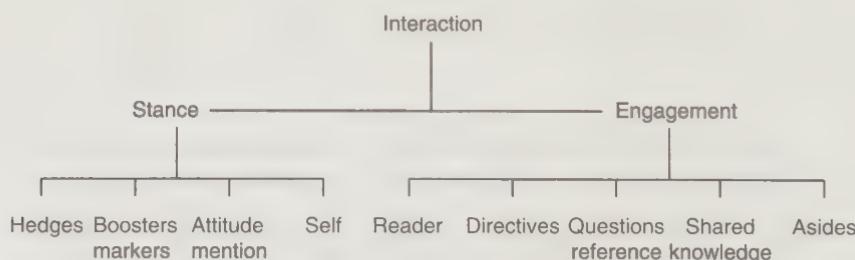
These structures allow writers to highlight warrants and evaluations in support of their arguments as they move from a relatively low-interpersonal intervention in earlier stages of the text to a more prominent writer engagement in discussions.

### *iii. Stance and engagement*

Academic persuasion is only partly accomplished by establishing claims for novelty and relevance: Writers must also seek to offer a credible representation of themselves and their work by claiming solidarity with readers, evaluating their material and acknowledging alternative views in appropriate ways. These interactions are accomplished in academic writing through the systems of stance and engagement (Hyland, 2005a) and I will elaborate these in this section.

I will use the term *stance* to refer to the writer's textual 'voice' or community recognized personality. This is an attitudinal, writer-oriented function which concerns the ways writers present themselves and convey their judgements, opinions and commitments. *Engagement*, on the other hand, is more of an alignment function. It concerns the ways that writers rhetorically recognize the presence of their readers to actively pull them along with the argument, include them as discourse participants, and guide them to interpretations (Hyland, 2005a). In other words, statements must incorporate an appropriate awareness of self and audience by presenting a credible writer persona and anticipating readers' possible objections and alternative positions. The rhetorical resources which realize these interactional functions are summarized in Figure 4.1.

Together these resources have a dialogic purpose in that they refer to, anticipate or otherwise take up the actual or anticipated voices and positions of potential readers (Bakhtin, 1986). I will briefly elaborate on each of these resources below, although it should be remembered that



**Figure 4.1** Key resources of academic interaction

these features have different salience across fields, with some 75 per cent of explicit stance and engagement features occurring in the humanities and social sciences.

### a. Stance features

**Hedges** are devices which withhold complete commitment to a proposition, allowing information to be presented as an opinion rather than fact (Hyland, 1998). They imply that a claim is based on plausible reasoning rather than certain knowledge and so both indicate the degree of confidence it might be wise to attribute to a claim while allowing writers to open a discursive space for readers to dispute interpretations. This is an example from biology:

6. We propose several possible reasons for this: (1) pressures increase upon freezing and thus may force bubbles back into solution at the time of thaw; (2) since xylem water is degassed by freezing there is a strong tendency for bubbles to redissolve at the time of thaw; and (3) xylem water may flow in advance of ice formation and could refill some of the previously embolized vessels.

(Biology RA)

**Boosters**, on the other hand, allow writers to express their certainty in what they say and to mark involvement with the topic and solidarity with their audience (Hyland, 2005a). While they restrict opportunities for alternative voices, boosters also often stress shared information and group membership as we tend to get behind those ideas which have a good chance of being accepted. Like hedges, they often occur in clusters, underlining the writer's conviction in an argument:

7. Of course, I do not contend that there are no historical contingencies. On the contrary, the role of contingencies should be stressed. If there were no contingencies, there would be no innovations, whether scientific or moral. On this point, we must definitely stop following Hegel's intuitions. Nobody can foretell that tomorrow totalitarian regimes will not reappear and eventually spread over the planet.

(Sociology RA)

Both boosters and hedges represent a writer's response to the potential viewpoints of readers and an acknowledgement of disciplinary norms of appropriate argument. Both strategies emphasize that statements don't just communicate ideas, but also the writer's attitude to them and to readers.

**Attitude markers** indicate the writer's affective, rather than epistemic, attitude to propositions, conveying surprise, agreement, importance, frustration, and so on, rather than commitment. Attitude can be expressed in a wide range of ways, as Martin (2000) and Martin and White (2005) have attempted to show by mapping the options available to speakers in conveying *affect* in their model of *appraisal*. Attitude is most explicitly signalled by attitude verbs, sentence adverbs and adjectives, and this marking of attitude in academic writing allows writers both take a stand and align themselves with disciplinary-oriented value positions.

8. No doubt there are a number of criticisms that adherents to the justice-based paradigm might make of the moral model Dworkin proposes. Still, I believe that Dworkin's investment model has remarkable resonance and extraordinary potential power. The worry I have about Dworkin's proposal arises from inside his model. It is interesting right off the bat to notice that . . .

(Philosophy RA)

**Self-mention** refers to the use of first person pronouns and possessive adjectives to present information (Hyland, 2001). Presenting a discoursal self is central to the writing process (Ivanic, 1998), and we cannot avoid projecting an impression of ourselves and how we stand in relation to our arguments, discipline and readers. The presence or absence of explicit author reference is therefore a conscious choice by writers to adopt a particular stance and disciplinary-situated authorial identity. The soft fields are particularly 'author-saturated' in this way:

9. Our investigation of writing at the local government office comprised an analysis of the norms and attitudes of each individual. We asked the different employees about their norms concerning a good text and a good writer. We also asked them about their attitudes toward writing at work. What we found interesting about this context, however, is the degree of uniformity of their norms and attitudes.

(Sociology RA)

## b. Engagement features

**Reader pronouns** offer the most explicit ways of bringing readers into a discourse but *you* and *your* are rare in research articles, perhaps because they imply a separation between participants, rather than seek connections, and this helps to account for the high use of the inclusive *we*. There are several motivations for using this form, but

most centrally it identifies the reader as someone who shares similar understandings to the writer as a member of the same discipline. At the same time as expressing peer solidarity, however, we also anticipates reader objections, presuming mutual understandings while weaving the potential point of view of the reader into the argument.

**Directives** are mainly expressed through *imperatives* and *obligation modals* and they direct readers to engage in three main kinds of activity:

- **textual acts** direct readers to another part of the text or to another text (e.g. *see Smith 1999, refer to table 2*, etc.)
- **physical acts** direct readers how to carry out some action in the real-world (e.g. *open the valve, heat the mixture*).
- **cognitive acts** instruct readers how to interpret an argument, explicitly positioning readers by encouraging them to *note, concede or consider* some argument or claim in the text.

**Personal asides** allow writers to address readers directly by briefly interrupting the argument to offer a comment on what has been said. By turning to the reader in mid-flow, the writer acknowledges and responds to an active audience, often to initiate a brief dialogue that is largely interpersonal, adding more to the writer-reader relationship than to propositional development:

10. And – as I believe many TESOL professionals will readily acknowledge – critical thinking has now begun to make its mark, particularly in the area of L2 composition.

(Applied Linguistics)

He above all provoked the mistrust of academics, both because of his trenchant opinions (often, it is true, insufficiently thought out) and his political opinions.

(Sociology)

**Appeals to shared knowledge** are marked by explicit signals asking readers to recognize something as familiar or accepted, irrespective of whether this is the actual case or not. These constructions of solidarity ask readers to identify with particular views and in so doing construct readers by assigning to them a role in creating the argument, acknowledging their contribution while moving the focus of the discourse away from the writer to shape the role of the reader:

11. It is, of course, possible to realize capacitors using the inter-metal, linear metal-poly, metal-diffusion, or poly diffusion (with an SiO<sub>2</sub> dielectric) capacitances.

(Electrical Engineering)

This tendency obviously reflects the preponderance of brand-image advertising in fashion merchandizing.  
(Marketing)

Finally, **questions**. These are the strategy of dialogic involvement par excellence, inviting engagement, encouraging curiosity and bringing interlocutors into an arena where they can be led to the writer's viewpoint (Hyland, 2002a). Over 80 per cent of questions in my corpus of 240 research articles, however, were rhetorical, presenting an opinion as an interrogative so the reader appears to be the judge, but actually expecting no response. This is most apparent when writers answer their question immediately:

12. Is it, in fact, necessary to choose between nurture and nature?  
My contention is that it is not.

(Sociology)

What do these two have in common, one might ask? The answer is that they share the same politics.

(Applied Linguistics)

The expression of stance and engagement is an important feature of academic writing, with frequencies actually greater than those for passives and past tense verbs (Hyland, 2005a). Overall, stance markers are about five times more common than engagement features and hedges dominate the frequencies, underlining the importance of distinguishing fact from opinion and the need for writers to present their claims with appropriate caution. Perhaps more importantly, these features represent choices based on a process of audience evaluation assisting writers to construct an effective argument and revealing how language is related to specific institutional contexts.

Despite the brevity of this sketch, we begin to get an idea of the rhetorical complexity of the RA genre as a textual weave of interpersonal and ideational resources which brings together novelty, affiliation, interpersonality and intertextuality in support of the writer's claims. Constantly evolving, and as we shall see at the end of this chapter, perhaps giving way as the principle genre of knowledge construction in some fields, the RA remains a defining feature of different disciplines and the jewel in the crown of academic communication.

## 4.2 The conference presentation

Despite receiving little of the attention lavished on the research article, a key means by which academic research is disseminated is through papers at academic conferences. One reason for this neglect is doubtless

the problems of collecting and transcribing spoken data and of coding for intonation, gesture, visuals and other non-verbal contextual information. Another difficulty, however, is that it is a genre of uncertain boundaries, covering contexts which range from an invited one hour plenary to a short parallel paper. It may present research at various levels of completion, from work in progress to post-publication overview, and be delivered to an audience of various sizes, homogeneity and expertise. At this stage of our understanding, however, there are good reasons for regarding the conference presentation (CP) as a distinct genre. In most cases, for example, it is likely to be written to be spoken, at least in note form, and so contain features of both modes; it also tends to be closely related to the emergence of a published written text; and to contain claims which have an as yet uncertain future. For these reasons the CP will be discussed as a single discourse in this section, acknowledging differences where the literature allows it.

### i. *The presentation context*

One thing that is certain about the CP is that, from the participants' perspective, it is inextricably embedded in the wider conference experience. Attending sessions and giving a paper are inseparable from meeting old friends, making new contacts, the buzz at coffee breaks, the book fair, the posters, the gossip, the academic celebrities, and the general intellectual charge of the event (Shalom, 2002). This mixing of social and research-process genres is a somewhat ephemeral, almost self-contained universe of discourse with its interpersonal encounters, brief excitements and occasional disappointments. The conference is thus a key event which offers members a momentary sense of belonging and community – often in stark contrast to their workaday university lives. Ventola (2002) uses the term 'semiotic spanning' to capture something of the intermeshing of the CP in this sequence of events, and how the conference itself seems to be marked off from the more enduring discourse worlds which conferees bring to the event and to which they return.

This is not to say that the CP, or a conference itself, is a stand-alone event, divorced from the community structures that support it. While commentators have noted the increasing dominance of English as the lingua franca of international conferences in many fields (e.g. Ventola, 2002), CPs remain very much a product of their specialisms that are organized, promoted and attended by members themselves. Conferences are important forums for enacting genre knowledge and affirming community affiliations through close encounters with colleagues and competitors. In this sense they are what Porter (1992: 107) refers to as 'a concrete, local manifestation of the operation of a discourse commu-

nity'. The relationship between community and conference is therefore mutually dependent, or symbiotic. As a result, the conference reflects the particular norms and patterns which communities have evolved for what goes on in such forums and the particular genres that adorn it.

More than this, through its embedding in a chain of community genres, a conference paper is very much part of the weave of working, talking and writing which characterizes the emergence of research in a discipline. Räisänen (2002), for example, shows the potential complexity of this embedding at a crash-safety conference where the CP is the end point of a sequence of genres. This begins with a conference announcement and a call for abstracts and is followed by submission, reviews and redrafting as the paper is published in conference proceedings and made available to participants before it is finally read and discussed at the conference. Awareness of a chain of events and genres like these can help participants to plan ahead and consider the reactions of different audiences to a series of abstracts, written drafts and orally delivered paper.

While some CPs are delivered following their written publication in this way, this sequence actually seems to be more common in the social sciences where funding bodies often require grant recipients to disseminate their research results in a variety of oral and written forums. The plenary talk also often tends to present already published work; being less an exposition of cutting edge research than a post-hoc celebratory overview of the field by an invited luminary. Perhaps more typically, however, the CP occupies an intermediate status between data and science (Ziman, 1974) or the actual research work and a published journal article. The CP thus provides an opportunity for testing the waters with a new idea and getting feedback on a current project as it moves from embryonic hypothesis to published paper.

As a result, it can often reveal something of the contingency of research, so that 'one glimpses research as it is actually conducted, before it is sanitized to present a picture of straight-line progress towards public knowledge' (Dubois, 1980: 143). This example from Rowley-Jolivet (2002: 104), for instance, shows how the challenges of real-world experiments are frankly acknowledged in the face-to-face presentation at a physics conference (13) while omitted from the final published paper (14):

13. With antenna in air we have the diamond data points where we were really getting killed by corona losses ( . . . ) I'll call your attention to this little gas bag at the feed section. Actually this turned out to be too small, we had to put a gas bag all the way up to about this area to protect the feed section which has very high electric fields from corona losses.

14. When very high voltage is applied to the antenna, losses to corona loading can be surprisingly severe. ( . . ) One means of reducing corona losses is to enclose the high field portions of the antenna in an insulating gas.

The sense of physical constraints, the confusions and tinkering of practical activity, are absent in the written version while the oral presented CP enables us to recover something of the actual, concrete work invested in the research itself.

### *ii. The conference abstract*

An early link in the chain of conference genres is the submission of an abstract. While regulated for text length and topic breadth by a public announcement, this is essentially a stand-alone genre which enters competition for available conference slots. While the abstract might point towards another, as yet probably unwritten, text it has a different and more urgent purpose than the paper itself. Typically submitted months ahead of the conference and blind reviewed, the abstract may be as far as the incipient CP actually gets, as rejection ends the chain for the submitting author and often means that he or she is unable to get funding to attend the conference. The abstract, then, is the point where the reader must be hooked. With rejection rates as high as 75 per cent in some fields, the CP abstract is necessarily a highly promotional genre which is more like a grant proposal or job application letter than an RA abstract (Hallack and Connor, 2006).

Both the research and the writer are therefore under close scrutiny in conference abstracts and because of this, writers tend to foreground their main claims and to carefully present themselves as competent community members. While Swales and Feak (2000: 42) point out the dangers of promising too much in an abstract, gaining acceptance means that writers need to demonstrate that they have something new and worthwhile to say. Because this is an 'occluded genre', largely hidden from public view, what we know of abstracts tends to come from fields most easily accessible to discourse analysts, such as rhetoric (Berkenkotter and Huckin, 1995; Faber, 1996), applied linguistics (Kaplan *et al.*, 1994; Yakhontova, 2002), and TESOL (Hallack and Connor, 2006). These point to a number of core rhetorical moves in the genre, with texts typically having a structure of *problem or purpose*  $\Leftrightarrow$  *method*  $\Leftrightarrow$  *results*  $\Leftrightarrow$  *conclusion*, although a general finding is that the presence of these moves does not seem to differ significantly between accepted and rejected proposals.

Despite the inability of a generic text model to explain the quality of an abstract, review committees appear to be impressed by texts which

can sell their originality and interestingness to an insider audience. Berkenkotter and Huckin's (1995) study of abstracts sent to the *Conference on College Composition and Communication* over three years, for example, shows that successful proposals were judged interesting in terms of topic selection, problem definition, and novelty. Writers of accepted abstracts were thus able to package their research in ways that highlighted its relevance and their own insider credibility to experienced members of the discourse community. Novelty and the projection of 'an insider ethos through the use of terminology, special topoi, and/or explicit or implicit references to the scholarly literature' (*ibid.*: 102) was what counted in judging successful abstracts.

Clearly, what is considered interesting and novel will vary across fields, but these studies suggest that it has much to do with how an issue is framed and problematized in an abstract. Successful writers use eye-catching titles and currently popular approaches. All this implies an insider status and an ability to persuade the programme panel that the writer is able, eventually, to deliver a high-quality paper at the convention. Successful writers thus establish a valued disciplinary context and situate themselves within it, defining their work as interesting and themselves as competent professionals.

### *iii. The presentation*

In the conference presentation itself we find a range of presentation styles. In his celebrated '*The presentation of self in everyday life*', Ervin Goffman (1981) identified three types of presentation: 'memorization', 'reading aloud' and 'fresh talk'. Dudley-Evans (1994) distinguishes 'reading style', where the speaker reads from notes, 'conversation style', which is more informal, and a more expansive, performer-oriented 'rhetorical style'. These characterizations capture the tension noted above between what is a highly reflective text, with many features that correspond to written research writing, and the immediacy of audience in time and in place which pushes a presentation towards a more interactive text. But while conference participants may encounter a range of different styles at an event, there appears to be a trend towards a more interactive pattern as the speaker shapes the message to connect with the immediate context.

The importance of interpersonal management and real-time text organization in conference presentations can be seen in a range of linguistics features which distinguish them from published papers. Compared with research articles, then, research into science presentations suggest that presentations contain:

- greater use of subject + active verb rather than passive forms (Rowley-Jolivet, 2002);
- more discussion of research failures (Thompson, 2002);
- more informal boundary markers such as *OK*, *right*, *now* (Webber, 2005);
- far greater use of self-mention (Luukka, 1996);
- greater imprecision in describing results (e.g. *roughly 0.3 in most cases*) (Dubois, 1987);
- more humour and self-irony (Frobert-Adamo, 2002);
- less use of extraposition ('*it is clear that*', '*it is possible that*' . . .);
- far more use of existential *there* ('*there are several reasons for this*') (Carter-Thomas and Rowley-Jolivet, 2001).

Interestingly, many of the features marking greater informality are particularly common in plenary presentations rather than CPs, perhaps because of the greater time available to create rapport with an audience (Webber, 2005). Overall, however, we can see the presence of these features as indicating a more interactive, spoken genre which involves real-time information management and engagement with a live audience. Additionally, however, they also point to the provisional and emergent nature of what is presented.

Something of the interpersonal effort invested in a CP is illustrated in this example from the opening of an applied linguistics presentation taken from Shalom (2002: 63):

15. Yes I'm sorry um this is the last talk right before tea and I've given you a rather dense handout there with lots of numbers on it. I will try to keep you awake throughout the session in spite of that um I actually won't be going through every single one of those numbers much to everyone's relief but I thought you might be interested in having them. Yeh I'm doing my PhD research with (name) at (institution) um sorry to mention your name like that I take all the blame for everything okay in (topic) and the focus on the talk is . . .

While such interactional work is also typical of experienced presenters, here we see a novice community member contextualizing her paper by orienting to the audience. As Shalom points out, this involves the use of considerable mitigation, humour and forewarning to bring listeners onside and perhaps offset criticism of the paper. At the same time, the speaker positions herself in relation to the community as a PhD student and therefore a 'modest knower' but with the protection of a well-known supervisor.

But while presenters may use more informal, explicitly interactive features than writers to protect themselves from criticism and win over a potentially sceptical audience, this does not release them from the obligation of novelty (Rowley-Jolivet, 2002). In fact, because the CP is closer to the original research than what is likely to appear only very much later in a published paper, this expectation is even greater. Participants are often looking for the latest developments in the field at conferences and speakers usually oblige them. These extracts from Rowley-Jolivet's (2002: 99–100) data from medicine and geology conferences suggest how speakers stress the news value and preliminary nature of their work in CP introductions:

16. I don't think that you'll find anything more up to date than some of these data that I'd like to show you now.

What I would like to present now is preliminary results of a small Mesozoic alkaline . . .

I suppose this is the key diagram in this talk, the full implications of which we probably haven't fully worked through.

The CP therefore offers opportunities to refine interpretations from feedback and to steal a march on others by presenting cutting edge results. Less welcome, however, is that it also opens the door to criticism and attack, particularly in the question stage which follows it. The ability to manage both textual organization and social relations becomes even more important in the Q and A session following many talks. Webber's (2002) data from medical conferences show, for instance, that while only 30 per cent of the 130 questions recorded were explicitly critical of some aspect of the CP, she notes that 'even neutral request for clarification may be perceived as a challenge by the presenter if it is difficult to answer' (Webber, 2002: 229). But although the presenter has the advantage of having rights to more speaking time and the option to judge a question as irrelevant, the Q and A can be difficult to negotiate, particularly as most of the information questions in Webber's study addressed issues outside the scope of the preceding paper. Presenters may be reluctant to be sidetracked or give away too much, but they are also interested in promoting and getting reactions to develop their work, and this represents an interactional challenge to all but the most accomplished speakers.

#### *iv. Visuals and handouts*

An important feature of CPs is their increasingly multimodal nature as talk is supported and organized by visual channels of communications

such as PowerPoint, projected slides, overheads and handouts. The non-verbal dimension of presentations is particularly important in scientific, medical and technical fields where they not only carry the main information load of the presentation but also help to structure the discourse through phrases like 'the last slide please' (Swales, 2004: 198). In fact, speakers often extemporize around their slides or video clips which serve to prompt their presentations with minimal use of notes.

This example from Räisänen (2002: 83) gives a sense of this 'on the hoof' visual-dependence:

17. I would now like to show a video of ah some of the cadaver sled tests. OK. First I'm showing a 3-point-belt restraint cadaver sled test. [Pause to let audience watch] I would like you to notice how the shoulder belt is positioned in all these cadaver sled tests. [Pause] This is a 2-point-belt restraint knee-bolster. [Pause] You can see the knee impacting the knee bolster. [Pause] This is another 2-point-belt restraint knee-bolster test. OK that's it.

This presenter at an automotive crash-safety conference uses the video as a means to organize his talk around experimental results from cadaver tests and to highlight particular aspects of these, mixing visual and oral discourses for persuasive purposes. As Räisänen points out, the visual mode here allows the audience to 'virtually witness' the results in the same way as the researchers did, adding persuasive force to the presentation.

Although presenters in mathematics may still use a blackboard, visuals appear to be replacing more elaborate verbal expositions in many fields as photographic and PowerPoint slides become ubiquitous in medicine, science and technology. Rowley-Jolivet (1999), for instance, found an average of one slide every 50 seconds in her corpus of 90 CPs in oncology, petrology and physics, with graphical representations exceeding textual and numerical slides in each of these disciplines. This perhaps reinforces the ideational, textual and interpersonal roles that visuals play in CPs, so that we can see visuals not only as providing information and structuring the development of the talk, but also as contributing to its interactive dimension by capturing the imagination of the audience through immediate access to data. This can be seen in Example 17 above, for example, and in the frequent use of photographs in some fields. Because photographs give direct access to raw data, as compared with the abstractions of graphs and tables, they function to reinforce the newness and immediacy of what is being presented (Rowley-Jolivet, 2002).

In some humanities fields such as history and linguistics, however, the role of visuals tends to be less apparent as papers are often read with no visual support at all. Handouts tend to be common in the soft fields, however, with exemplar sentences accompanied by a reference list being the preferred format in applied linguistics (Belles and Fortanet, 2004). There is, moreover, perhaps a certain scepticism among academics about the value which technology adds to presentations in the soft fields. Myers, for example, not only complains of the ways PowerPoint has introduced commercial styles into academic presentations, but notes its powerful impact on the relationship between the discourse and the presenter:

[T]he written text, produced by the machine, has become the star: I am reduced to an unseen voiceover of my own lectures . . . it marks a shift in what Goffman (1981) called footing; that is, I am seen as the animator rather than the source of the utterance. Instead of my speaking with the aid of some visual device, the text is speaking with my aid.

(Myers 2000: 184)

In sum, the conference presentation is a key research genre. Not only does it situate knowledge claims closer to their source than a published article, but it is also central to both the knowledge-making practices of academic communities and its members sense of participation and belonging. It appears, moreover, that the CP is a complex, multi-semiotic event in which oral and visual, formal and informal, prepared and impromptu discourses all co-occur. It is a genre where co-presence, interaction and risk reside so that the whole becomes an expert rhetorical accomplishment where the speaker projects a competent, accessible persona while relating cutting edge information to meet the real-time processing and interactional needs of a live audience.

### 4.3 Other research genres

While research articles and conference presentations have the greatest visibility and frequency in the disciplines, they do not exhaust the genres which populate the research landscape. Reports, manuals and proposals dominate in technical fields (Killingsworth and Gilbertson, 1992); reviews and essays in literature; and book reviews in history (Becher and Trowler, 2001).

The journal article, as Griffith and Small (1983) point out, 'is a poor vehicle of communication' for many areas of the social sciences, 'ill-suited to discuss extremely complex issues'. The detailed discursive attention and elaborate justification of interpretation which the monograph offers writers make it a more effective medium for disseminating and evaluating

research in fields such as sociology and history, for example. Despite increasing pressures from Research Assessment panels towards the uniform production of peer-reviewed articles, it is still the case that single authored, leisurely gestated books still sell and accumulate esteem for their writers in many soft fields. There also appears to be space for even more esoteric and glacially developed research genres such as the *flora* and the *treatment* which classify plant species in Systematic Botany (Swales, 1998). In this section I look briefly at some of the more common and well-studied research genres: science letters, book reviews and e-journals.

### i. *Scientific letters*

The emergence and rapid growth of the scientific letter genre is a discoursal response to social and academic changes in academic research. In the fast-paced world of modern science, increasing specialization and rapid knowledge growth have led to intense competition. Many hard knowledge fields are characterized by fierce rivalry as the rewards of reputation, including the funding to continue one's research, are often tied to establishing priority through first announcement. One outcome has been the emergence of the scientific letter, 'squib', or 'quick report' which facilitate the rapid circulation of new and urgent findings by restricting length and streamlining the review process.

Typically less than six pages long, letters are often published online within days of acceptance and in print within five to seven weeks of submission, assisting both writers with quick publication and information saturated scientists with succinct access to new research. This description from the webpage of one such journal summarizes the advantages for authors:

*Statistics & Probability Letters* is an international journal covering all fields of statistics and probability, and providing an outlet for rapid publication of short communications in the field. Many statisticians today are concerned by the labyrinth of research to be conquered in order to reach the specific information they require. To combat this tendency, *Statistics & Probability Letters* has been designed outside the realm of the traditional statistics journal. The concise article format (limited to six journal pages including references and figures) permits the editorial board to process papers rapidly and enables the reader to learn about new results and developments efficiently. Letters allow readers to quickly and easily digest large amounts of material and to stay up-to-date with developments in all areas of statistics and probability.

This is an objective more succinctly captured in the breathless prose of another letters journal as: '*Finance Research Letters* offers an exciting publication outlet for novel and frontier finance'.

Letters journals have largely evolved from short communications reporting work in progress in parent journals to become the primary forum for the dissemination of innovative work in the natural sciences. *Physical Review Letters*, *Chemistry Letters*, and *FEBS letters* are now among the leading journals in their fields, accounting for a massive output of work, often publishing monthly, or even weekly, and containing over 40 papers in each issue. The letter now rivals its established uncle the research article, in institutional respectability and is the preferred forum for announcing new breakthroughs. As a result, letters tend to focus on what is currently fashionable and exciting in science while research articles have taken on a more archival function, containing detailed elaborations and proofs, as a previous editor of *Physics Review Letters* observes:

Letters journals swing back and forth from one field to another while the archival journals plod resolutely along, collecting and cataloging the accumulating wisdom of the scientific community.

(Passell, 1988: 37)

Letters are pre-eminently declarations of findings and in keeping with this goal foreground novel claims and newsworthy information. They are 'characterized by a sense of urgency and importance, and they have a style and structure which allows authors to display key ideas prominently' (Blakeslee, 1994: 91). Titles and abstracts are written to announce findings and interpretations and to foreground what is innovative in the work, while methods are typically cursory. Background is generally scanty and the literature largely assumed, while introductions are used to foreground importance and originality. One example of the promotionalism in the genre is the greater use of boosters compared with research articles (Hyland, 2004b), allowing writers to present their work with assurance while strategically engaging with colleagues:

18. This unambiguously shows that the picture of antiferromagnetically coupled pairs is not adequate to describe the thermodynamics of local moments in the metallic phase.  
(Physics)

The results demonstrate a striking effect of INH and establish a basis for further investigation of growth cycle-related phenomena in mycobacteria by flow cytometry.

(Biology)

It is noteworthy that boosters often occurred in introductions and conclusions as these are the sections that Bazerman (1988: 243) identified as being those first read by physicists when scanning a paper to judge its relevance to their own work.

But while letters often lack the closely argued detail and elaboration typically associated with scientific writing, they appear to be evolving to ever more closely resemble research articles. A scan of 30 such letters journals shows a number of these short communications to be taking on some of the more obvious characteristics of the standard RA. Perhaps this is because innovative experimental methods require greater elaboration, or maybe there is an irresistible pull for scientists towards the 'empiricist repertoire' of the IMRD format?

### *ii. Book reviews*

While often neglected as a research genre, the book review plays an important role in disciplinary communication as the public evaluation of research. Normally editorially commissioned, reviews occur in many academic journals and most disciplines, although they are more common in the soft knowledge fields where books are more prominent forms of scholarship. Highly visible, often read and carefully considered, book reviews provide both junior and established academics with a platform to proclaim a public position without detailed argument, empirical data, or a protracted review process. As this informant stressed:

In philosophy a book review can go down as a serious contribution to research in the field and it will be cited because in that review it may be the first time a person has articulated an argument which other people have found persuasive. Philosophers really take book reviews seriously. They try very hard to say sometimes very smart. It's also contributing to the knowledge in the field.

(Philosophy interview)

The review functions as 'a change agent, creating a critical climate of opinion' (Ortega y Miranda, 1996: 191), and is considered to be 'a crucial site of disciplinary engagement' (Hyland, 2004b: 41), allowing community members to debate each other's ideas and analyses in a public forum (Hyland, 2004b; Tse and Hyland, 2008). Unlike research articles, book reviews do not simply respond to a general body of impersonal literature but offer a direct, and often critical, encounter with a particular text and its author. Interactions here are a key element of the discourse, balancing critique and collegiality to send clear signals of how writers wish to position themselves in relation to their readers, target author and disciplinary community. While all academic writing is evaluative in some way, book reviews are explicitly so (Hyland, 2004b), as in these examples:

19. This is an excellent and timely book that should be in the library of every self-respecting Department of Biochemistry or Plant Science.

(Biology)

The authors' treatment of psychometric issues is spotty and disorganized.

(Marketing)

This promise is not wholly fulfilled and the chapter disappointingly concludes . . .

(Sociology)

Here, then, we see the workings of the peer group in perhaps its most nakedly normative role, publicly setting out standards, assessing merit and, indirectly, evaluating reputations.

For these reasons, researchers have seen reviews as an ideal place to explore disciplinary values and rhetorical strategies. In a study of evaluation in 160 reviews, for example, I found a balance of praise and criticism overall, but a marked tendency for praise to be given to global aspects of the book (20) and criticism to be directed to specific issues (21) (Hyland, 2004b):

20. Would that this excellent paperback had been available 20 years ago!

(Mechanical Engineering)

*Challenging Codes* is certainly the best introduction to the study of . . .

(Sociology)

Simpson's book is an excellent guide.

(Physics)

21. On p. 195 it is not made clear why  $\text{SO}_4^{2-}$  competitive inhibition of . . .

(Biology)

But this claim turns out to be misleading.

(Philosophy)

It does not give much of an explanation why neural networks are useful, and does not derive any of the equations.

(Electrical Engineering)

This pattern reflects editors' admonishments for reviewers to provide an overview of the text for prospective readers while raising particular problematic issues for the field, but it also limits the scope of negative comment. Global criticism condemns the entire work, a particularly threatening act, and this seems to have been avoided as far as possible in these reviews and, where it occurred, was often mitigated, either by diffusing the criticism in some way or by restricting it to an individual opinion (Hyland, 2004b).

There was also considerable disciplinary differences in the *balance* of evaluation with substantially more criticism in the soft disciplines. Praise tended to be more fulsome and criticism more acerbic in the soft knowledge papers, with the latter actually exceeding the former in philosophy and sociology reviews. Because the issues in the social sciences and humanities are fairly loosely defined and inquiry tends to be treated as a reiterative process involving repeated close scrutiny of earlier problems, the appraisal of an individual's work can be a significant means of getting to grips with important questions. Writers therefore sought to use this discursive space to explore issues in some depth, anchoring the text in the concerns of the wider discipline and often expounding their own views at length. Reviews in science and engineering, on the other hand, were much shorter and dominated by praise, which was almost twice as frequent per 1000 words as in the soft domains.

There also appear to be gender differences in the rhetorical practices of book reviewers. Among the findings of Tse and Hyland's (2008) study of metadiscourse in 56 reviews in biology and philosophy was that male writers tended to make bolder statements, boost their arguments more, and generally take a more confident and uncompromising line. A practice perhaps afforded them by seniority in the field, as these informants noted:

Yes scientists are mainly male . . . the imbalance is even greater when you go up the ladder. . . It's hard because part of being confident depends on how you're perceived. You know, many people think women are not as good in writing that kind of 'factual' report. I know this perception is wrong but it affects how you see and present yourself.

(Female Biology interview)

Unfortunately there is a huge gender imbalance in professional philosophy. The observation that men use more 'I' and are more assertive may be due to the hierarchical thing that the women feel that they have to be more careful or less assertive and this has to do with masculine aggressivity.

(Male Philosophy interview)

It may be, however, that status, rather than gender is the key influence here, and overall our data tend to support Francis *et al.*'s (2001) contention that the academic writing of men and women exhibits far more similarities than differences. There were, in fact, greater variations between *disciplines* than between *genders*, with the philosophy reviews containing far more metadiscourse than the biology texts. Essentially metadiscourse is a collective term for various interpersonal features of discourse (Hyland, 2005b) and so it is not surprising to find it more frequently used in the more discursive, explicitly interpretive

soft fields. But we also need to recognize that the reviews were responding to very different kinds of books. As I noted earlier, while books written in philosophy are regarded as important vehicles for advancing scholarship and presenting original research, those in biology often assemble already codified knowledge for students. As a result, philosophers wrote their reviews to engage, critique and expound upon fine points of argument, while this was not usually the case in biology.

Interestingly, however, while disciplinary activity encourages the performance of certain kinds of professional identities, there seem to be gender differences in the enactment of these identities. Female philosophers tended to use more *interactive* metadiscourse, or features which manage information flow and signal the arrangement of texts with regard to readers' likely understandings. Males, in contrast, used far more *interactional* features such as engagement markers and boosters which express greater attitude, commitment, and reader involvement. While both sets of options are available to both men and women, there is a clear gender-preferred argument repertoire, which several informants recognized:

Argument is central in our field, but there are different ways to do it [...] clarity and logic is most valued in the field and it is relatively easy to learn how to write clearly and logically than to forcefully express something, because it only takes more practice to write clearly, but it may involve changing your own personality if you want a battle.

(Female Philosophy interview)

I won't say men pay less attention to organizing their arguments. But I do want to do more than simply set out my views. I also want to convince people and present different views in a way such that some would carry greater force, . . . this is about the philosophical spirit of questioning and arguing.

(Male Philosophy interview)

The directly challenging style of philosophical debate described by Bloor (1996) as 'mind-to-mind combat', is therefore largely rejected by the female reviews in favour of the construction of a persona which respects philosophical values of rationality and careful exemplification.

In sum, while this is a potentially threatening genre, both for the author of the text reviewed and the community more generally, the review works because both writer and reader approach the text with 'mutual co-awareness' of the other (Nystrand, 1987). Its meaning draws on both readers' familiarity with research networks and disciplinary knowledge, and also of an interpretive framework which includes an understanding of appropriate social interactions.

### iii. Electronic journals

While there are other research genres worthy of discussion, I will conclude this already long chapter by looking at recent changes and future directions of published research. Scholarly publication is changing radically as a result of the internet, with submission practices, peer-review, publication methods, and access to the literature all undergoing development and change, especially as research funding agencies often require authors to submit their articles for inclusion on internet platforms such as *PubMedCentral* or subject repositories. It is electronic journals, however, which have perhaps had the greatest impact on academic communication practices to date. The number of academic e-journals has increased from about 25 in 1991 to over 5,000 in 2001 (Hovav and Gray, 2002). Today almost all academic journals have digital versions, with several moving entirely to electronic publication, and as libraries increasingly purchase subscriptions to the electronic versions this has become the principal source of access for academics.

The explosion of the digital dissemination of research has come about due to the same pressures for rapid publication and wider access which has propelled the growth of scientific letter journals. Clearly the typical publication delays of several months makes print journals a cumbersome format for disseminating the latest scientific research. An editorial in the *Journal of Health Communication*, for example, argues that the terrorist release of anthrax spores into the US postal system in 2001 underlined a need for a 48 hour publishing deadline to alert clinicians and other healthcare specialists to new agents in order to avert epidemics and save lives (Ratzan, 2003). While such speeds involve radical new review procedures, many journals now publish electronic versions of papers as soon as they are peer-reviewed and ready, without waiting for proofreading by production staff or the assembly of a complete issue, cutting production times by months.

Such rapid publication times, however, are not rapid enough for all fast moving sciences and the exchange and sharing of information now often occurs well in advance of the final publication. New web-based tools enable academics to share their findings and so potentially remove the need to consult formal journal articles. In some fields such as astronomy and high-energy physics, for instance, the role of print journals in disseminating research has largely been replaced by preprint databases such as *arXiv.org*. While preprints have long been circulated among academics to communicate current results and get immediate feedback prior to publication, the posting of preprints on arXiv is now commonplace. It is true that material uploaded to such preprint databases is eventually published in peer-reviewed journals, but this is

largely for purposes of quality control, archiving and establishing scientific credit rather than communicating findings.

In addition to publication speed, e-journals potentially transform the way research is done by enabling more targeted and immediate literature searches. It is clear that the volume of scientific literature now greatly exceeds the ability of academics to identify all information germane to their research. Sophisticated search facilities are therefore now essential to allow convenient access to relevant e-published literature. The *Scopus* database, for instance, gives users fully searchable access to 40 million abstracts and 18,000 journal titles from 4,000 publishers, making it faster and more convenient to search and retrieve literature from the user's office computer. These research opportunities are also extended to previously disenfranchized users around the world through the articles which are freely available online through Open Access channels of various kinds, most notably the UN sponsored *HINARI*, *AGORA* and *OARE* initiatives (see Chapter 8).

While the full discoursal and rhetorical impacts of electronic publishing on research reporting have yet to be described, or even realized (Hovav and Gray, 2002), the hypertextual character of the web allows more than improved access to text, figures, and high-resolution images. It is, in fact, a medium which actualizes intertextuality, transforming the potential connections between texts into real ones by giving readers immediate access to associated texts. The fact that e-journals allow writers to provide links to digitized graphics, video, sounds, animation, and equations through resources such as the *ARTstor Digital Library* or the *NIST Digital Library* of Mathematical Functions, for example, provides a very different reading experience by mixing the visual and the verbal in new ways. Kress (1998) characterizes this as a 'tectonic shift' in semiotic practices which requires new competencies to understand and use. This is because the meanings represented in these different ways cannot simply be translated across modes, but 'offer fundamentally distinct possibilities for engagement with the world' (Kress, 1998: 67).

In addition, the ability to link immediately from a reference to the content of a source text through digital switchboards such as *Cross-Ref* not only enhances the efficiency of browsing the academic literature, but also enables readers to construct pathways through the text which better reflect their own specific research interests. This web of interconnected textual elements has important implications, as it transforms the familiar linear space of print and gives the reader greater freedom in how he or she can approach the text. As, Douglas noted a decade ago:

The beauty of hypertext is (...) that it propels us from the straightened 'either/or' world that print has come to represent and into a universe where the 'and/and/and' is always possible. It is an

environment more conducive to relativistic philosophy and analysis, where no single account is privileged over any others, yet, because it is written in code, writers can ensure that readers traverse some bits of the argumentative landscape more easily and more frequently than others, or that readers are left to make their own connections between one bit of text and another.

(1998: 155)

Finally, the reference links that readers choose to follow are also likely to be of interest to bibliometrists and others who seek to track the ways which cognitive influence is exercised and social research networks operate (e.g. Cronin, 2001). Not only does this carry the potential to gain a greater understanding of how academic research is conducted and the extent of cross-disciplinary activity, but it may also mean that the principles of citation indexing can be applied more widely than at present. Currently the ISI, which measures the impact factor of articles and journals, has a coverage limited to a relatively small set of (overwhelmingly English language) periodicals, but the extension of citation indexing tools to open electronic publishing contexts means more accurate counting of a wider constituency. This means that work in currently non-indexed journals will be more visible and that citations to an individual's work, or perhaps even to an individual's contribution noted in acknowledgements, can be measured. Such practices are likely to increase an academic's standing and perhaps even impact on university promotion and tenure decisions.

Such possibilities, together with other radical proposals such as those for self-publishing and open peer review lie in the future, but they suggest that electronic publishing has only just begun to have an effect on both research practices and discourses.

## **4.4 Conclusions**

In this chapter I have provided something of an overview of the key discourses which communicate research and so carry the prestige of the academy. While it is only possible to scratch the surface of such a complex area in a single chapter, I have sketched central features of the main research genres and sought to show the connections between research products and processes. The chapter has also highlighted issues raised in earlier chapters, such as the promotionalism of academic communication, its disciplinary character, and the fact that academics do not only produce texts that plausibly represent an external reality, but use language to acknowledge, construct and negotiate social relations. In the next chapter I turn to instructional discourses and, in particular, to the importance of talk in academic communication.