

- Devitt, A. J. (1991). Intertextuality in tax accounting: Generic, referential, and functional. In C. Bazerman & J. Paradis (Eds.), *Textual dynamics of the professions* (pp. 336-357). Madison: University of Wisconsin Press.
- Engeström, Y. (1987). *Learning by expanding: An activity theoretical approach to developmental research*. Helsinki: Orienta-Konsultit Oy.
- Freedman, A., & Medway, P. (1994). Locating genre studies: Antecedents and prospects. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric* (pp. 79-101). London: Taylor & Francis.
- Hailo, J. L. (1966). *Approaches to Macbeth*. Belmont, CA: Wadsworth.
- Hillocks, G. (1998). *A study of writing assessment in five states*. Paper presented at the annual AERA Convention, San Diego, CA.
- Kamler, B. (1994). Gender and genre in early writing. *Linguistics and Education*, 6, 153-182.
- Kucan, L., & Beck, I. L. (1996). Four fourth graders thinking aloud: An investigation of genre effects. *Journal of Literacy Research*, 28, 259-87.
- Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech*, 70, 151-167.
- Miller, C. R. (1994). Genre as social action. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric* (pp. 23-42). London: Taylor & Francis.
- Moffett, J. (1968). *Teaching the universe of discourse*. Boston: Houghton Mifflin.
- Petraglia, J. (1997). *Reality by design: The rhetoric and technology of authenticity in education*. Mahwah, NJ: Lawrence Erlbaum.
- Russell, D. R. (1997). Rethinking genre in school & society: An activity theory analysis. *Written Communication*, 14, 504-554.
- Russell, D., Lewis, S., & Riggs, A. (1996). Growing together: Curricular and professional development through collaborative portfolio assessment. *English Leadership Quarterly*, 18, 13-18.
- Stodolsky, S. S., & Grossman, P. L. (1995). Content as context: The role of school subjects in secondary school teaching. *Educational Researcher*, 24, 5-11.
- Street, B. V. (1984). *Literacy in theory and practice*. Cambridge: Cambridge University Press.
- Street, B. V. (1996). Academic literacies. In D. Baker, J. Clay, & C. Fox (Eds.), *Challenging ways of knowing: In English, mathematics and science* (pp. 102-121). London: Falmer Press.
- Swales, J. (1990). *Genre analysis*. Cambridge: Cambridge University Press.

12

From Little Things Big Things Grow: Ecogenesis in School Geography¹

Jim Martin
University of Sydney

RECONCILIATION

Change happens (Lemke, 1994, 1995). Quickly, as a text unfolds. Steadily, as we mature. Gradually, as our culture moves along. In this chapter I will look at change in Australian secondary school geography, drawing on some work by Robert Veel (e.g., 1998) on related changes in school science. Veel is interested in the ways in which science is "going green," as environmental perspectives reshape the curriculum. Student writing in geography reflects changes of this kind and poses a number of challenges for genre theory as far

¹A spoken version of this chapter was first presented as part of a joint address (with Anne Cranney-Francis) to the 1993 LERN (Literacy and Education Research Network) Conference-Working with Genre III; it reports on research into secondary school geography undertaken as part of the NSW Disadvantaged Schools Program's Write It Right Project (1990-1996). I am indebted to both LERN and WIR members for their support, especially to Sally Humphrey, our geography specialist, who drew this data to my attention. For further information on LERN and WIR see Cope and Kalantzis (1993) and Christie and Martin (1997), respectively.

as text structure and curriculum are concerned. Here I want to consider how genre analysis in a functional model of language might deal with "greening" discourse and the ideology such change encodes. Basically, my argument will be that secondary school geography shows signs of having incorporated more humane environmentalist attitudes into its curriculum without necessarily incorporating the ecological understandings needed to enact these attitudes, and that these humane attitudes are not sufficiently deconstructive of the economic pressures putting our environment at risk.

My strategy for exploring discourse in relation to social change is a linguistic one, grounded in the language of specific texts. Rhetorically, I have chosen to construct the argument metaphorically as a journey from home, as it might be experienced by student writers moving into green discourse. This is a materialist stance; as a linguist, my material is language. We'll be working from text upwards to social context—from inside discourse out.

My Place (description)

Let's begin at home, where we first learn to find our way around. Home is something we describe, comprised of individuals, specific things, and particular places, all in relation to one another. As a ten-year-old describes . . .

Text 1. Our house is really nice. It has 9 rooms and a hallway. The nine rooms are The boys bedroom, Dad and Anne's bedroom. My bedroom which is also Dads study, The Bathroom, The Dining room, The lounge-room, Kitchen, Sunroom and last of all Anne's study. Our house is single storey and therefore is much cosier to move about from one place to another. At the front of the house are the boys room on one side of the hall and Dad and Anne's bedroom on the other side. If you order the rooms from the front of the house to the back it would go like this My room, Bathroom, Dining room, Lounge room, Kitchen, Sunroom and Anne's study. The front garden has a big Wattle tree, Camellias and some other flowering plants in it. There is a path that goes through the middle of the front garden. The path leads to a small tiled veranda. The back garden also has a Wattle tree. As well as the Wattle tree there is a Jacaranda tree, 3 varieties of Grevillia, some Jasmine that hangs over from one next door neighbours house, a lemon tree from the other side, a lemon tree of our own and some other plants. Our Dad has a vegetable garden that had plenty of strawberries but they all died. Now he grows some herbs including Corriander and Parsley. In his vegetable garden he also grows lemon grass and spinach. Next to the Vege garden is the garage that is only used for keeping bikes, Gardening things and the Lawn mower in. Our house is a wonderful place.

Grammatically, the text is especially concerned with place. Four clauses place parts in relation to wholes:

It [our house] has 9 rooms and a hallway.

The front garden has a big Wattle tree, Camellias and some other flowering plants...

The back garden also has a Wattle tree.
a vegetable garden that had plenty of strawberries

There are twelve prepositional phrases that locate parts in relation to one another; six of these involve nominal groups dealing with perspective (as underlined below).

At the front of the house
on one side of the hall
on the other side [of the hall]
from the front of the house to the back
in it [the front garden]
through the middle of the front garden
(leads) to a small tiled veranda
from one next door neighbours house
from the other side [of the back garden]
In his vegetable garden
Next to the Vege garden
the garage that . . . in

From the description you could probably draw a picture, or even a map. Neither in fact accompanied this text, which was written at home, not at school. We see things, from the eyes of the child, as a kind of tour (Horvath, 1985; Linde & Labov, 1975)—from the front of her home to the back, as you might stroll through.

Their Place (recount)

From home, to school, and beyond. We move around and visit another place. And come back home. As a seven-year-old recounts . . .

Taronga Park Zoo

Text 2. Last Wednesday all Year 1 went to Taronga Zoo.

First we went to have a lesson. We all saw a ringtail possum and the teacher showed us a koala's hand. We saw a great white shark's mouth and I saw a lion.

We saw a peacock while we were having lunch and my Dad came to the Zoo with me and monkeys and a big gorilla and we saw zebra and a giraffe and I had a good time at the Zoo. I went back to school. I felt good.

I liked the lion and the elephant and giraffe but the best thing was going on the train and the ferry and the bus and I felt good going back home and when I got back home I felt exhausted and we had a snack.

Grammatically, this text is also concerned with place (*to Taronga Zoo, to the Zoo, at the Zoo, to school, on the train and the ferry and the bus*), but equally with time (*Last Wednesday, First, while, when*), including several implicit temporal connections, such as:

We all saw a ringtail possum and [then] the teacher showed us a koala's hand. [then] We saw a great white shark's mouth and [later] I saw a lion.

It's the trip that matters—travelling (*went, went, came, went, going, going*) and seeing things (*saw, saw, saw, saw*). From this text you couldn't draw a picture or map of the zoo, but you do know how the writer felt (*I had a good time, I felt good, I liked the lion, the best thing was, I felt good, I felt exhausted*); he shares his experience with us, as we might expect from this story genre (Martin, 1997a; Martin & Plum, 1997). We are left with the memories of another place, and the feelings that go with them

Them (parts)

Beyond experience, there is knowledge—understanding that transcends the personal. More than a memory, as a Year 10 geography student reports . . .

The Jaguar

Text 3. In South America, the jaguar is the greatest of the hunters and its vantage point is a tree, the jaguar leaps onto its unsuspecting prey. Ranging to eight feet in length and 125 to 120 pounds in weight, the jaguar is the largest of all the cats. It is stocky, muscled body, short legs and massive chest make the jaguar a powerful and efficient hunter. Although the jungles of Brazil form the centre of the jaguar's homeland they have been spotted as far away as Mexico.

Through its range, the jaguar adapts to many habitats from the swampy marshes to the stifling rainforests. The jaguar is also a good climber but does most of its hunting on the ground. Deer, tapir, peccary and toucans are frequent victims but the big cat is also fond of fish.

Grammatically, this text constructs collective wisdom—based not on personal experience but on the documents accumulating the professional and personal experience of many others. The jaguar is identified, classified, and described:

In South America, the jaguar is the greatest of the hunters
the jaguar is the largest of all the cats
It is² stocky, muscled body, short legs and massive chest make the jaguar
a powerful and efficient hunter.

The jaguar is also a good climber
but the big cat is also fond of fish.

With one exception³ the tense is simple present (*is, is, leaps, is, make, form, adapts, is, does, are, is*), signalling timelessness (i.e., universal truth); and there is no modality (i.e., no doubt). With the exception of reference to two locations (Brazil and Mexico), all the nominal groups involve generic reference—to the jaguar (meaning the class as a whole), habitats, jungles, marches, rainforests, prey, victims, deer, tapir, peccary, toucans, fish. This configuration of meanings recurs again and again in the report genre, with a view to documenting generalizations about classes of everything in and around our world (Christie & Martin, 1997; Halliday & Martin, 1993; Martin, 1985/1989). As our young geographer illustrates . . .

Gorilla

Text 4. The gorilla is commonly known as the gentle giant of the rainforest. The biggest of the apes, sometimes reaching a weight of 300 kilograms and a height of 1.75 metres. The gorilla is quite a friendly creature unless threatened or provoked. The rainforests which these gorillas inhabit supply all the fruits and plants they need.

Orangutan

Text 5. Orangutan means man of the woods. They are called this because like other great apes, gorillas and chimpanzees they are like humans in many ways.

At 80 kilograms the male orangutan is by far the largest truly tree-dwelling. Treetop life for such a heavy animal would be impossible if it did not possess remarkable hooked hands, hand-like feet, long arms and tremendous strength. These adaptations allow the orangutan to hang tirelessly, for hours at a stretch, suspended by only three limbs while picking

²As scribed, this is a blended structure, starting off describing the jaguar (as stocky) but finishing by classifying it (as a powerful hunter); perhaps *It is* is better read as *Its*, in which case the clause as a whole is classifying.

³The exception is "have been spotted," which refers more specifically to sightings of the jaguar in Mexico.

fruit with the spare hand. It can only hang upside down, clinging with only one foot.

Their Space (whole)

Beyond parts (inhabitants), there is the whole—the place (zoos) where we first meet exotic fauna, and the space (habitats) where we later learn they really belong. Our student geographer uses the report genre to construct a habitat for the jaguars, gorillas and orangutans documented above . . .

Rainforest

Text 6. The name rainforest is commonly applied to the luxurious evergreen forest typical of wet tropical lowlands. Most of these rainforests are situated close to the equator. Factors favourable to the development of the true tropical rainforest are annual rainfall amounts in excess of 1500mm. The rainforest experiences no true dry season. The average temperature lies within the range of 0°C to 45°C.

A characteristic feature of the climate⁴ tropical rainforest is the storied or stratified layering of the dense tree canopy. The crowns of the trees usually form three distinguishable stories, but occasionally they form only two. The trees themselves are remarkably uniform in general appearance even though the number of separate species may be large. These trees trunks are usually straight and slender with the bases often flanged by plank buttresses. The foliage consists of large leathery leaves but flowers are usually quite inconspicuous. In most cases, herbaceous ground flora is sparse and the soil bare or thinly covered by dead leaves. An abundance of climbers is characteristic of the forest, however, in addition to almost unbelievable numbers of epiphytes, which grow on trunks, branches and even the leaves of the trees. The latter group of flora include some of the most exotic flowering plants found in any range.

As a report this text draws on similar resources to texts 3-5 above—timeless processes (*experiences, lies, form, etc.*), generic participants (*luxurious evergreen forest, wet tropical lowlands, etc.*) and relational processes that describe (*These trees trunks are usually straight and slender*), compose (*The foliage consists of large leathery leaves*) and exemplify (*A characteristic feature of the climate? tropical rainforest is [illustrated by] the storied or stratified layering of the dense tree canopy*). Beyond this, the task of generalizing about an entire habitat as opposed to a single species depends on additional resources—specialized geographical terms, including precise measurement (*evergreen forest, wet tropical lowlands, the equator, annual rainfall amounts*

⁴Handwriting illegible; perhaps intended as "the climate of the tropical rainforest."

in excess of 1500mm, the storied or stratified layering of the dense tree canopy, the bases often flanged by plank buttresses, herbaceous ground flora, epiphytes, etc.), abstractions⁵ (*name, factors, amounts, range, feature, numbers, group*) and nominalizations (*development, layering, appearance, abundance*). These may be configured together in complex nominal groups:

the storied or stratified layering of the dense tree canopy
some of the most exotic flowering plants found in any range.

And several nominal groups involve two lexical modifiers:

the luxurious evergreen forest
wet tropical lowlands
the true tropical rainforest
annual rainfall amounts
no true dry season
three distinguishable stories
large leathery leaves
herbaceous ground flora
the most exotic flowering plants

This proliferation of information is not organized grammatically with respect to location or time, as in texts 1 and 2 above. Rather the information is organized presentationally, by means of theme (Halliday, 1994). First the rainforest as a whole is introduced and described; then the layered structure of the rainforest trees is introduced and described, layer by layer; then ground cover is considered; and then climbers. The sentences introducing each of these phases are presented below, followed by the clause themes⁶ they prefer; the effect of this information flow is a top to bottom perspective on rainforests' floral composition.

The name rainforest is commonly applied to the luxurious evergreen forest typical of wet tropical lowlands.

Most of these rainforests

Factors favourable to the development of the true tropical rainforest

The rainforest

The average temperature [of the rainforest]

⁵By which I mean terms referring to nonsensuous experience (i.e., things we can't see, hear, touch, taste, or feel); Martin (1997b).

⁶For Halliday, Theme in English is realized through clause initial position, and comprises meanings up to and including the first content unit of the clause.

A characteristic feature of the climate? tropical rainforest is the storied or stratified layering of the dense tree canopy.

- The crowns of the trees
 - but occasionally they [the crowns of the trees]
 - the trees themselves
 - even though the number of separate species [of trees]
 - These trees trunks
 - with the bases [of these trees]
 - The foliage
 - but flowers
- In most cases, herbaceous ground flora is sparse and the soil

An abundance of climbers is characteristic of the forest, however, in addition to almost unbelievable numbers of epiphytes, which grow on trunks, branches and even the leaves of the trees.

The latter group of flora

We should also note that generalizing safely depends on a range of hedging resources, which modify the scope of claims. These resources include measure adjectives (*some, most*), typifying adjectives (*typical, characteristically, often*), and semantically related adverbs (*commonly, usually, occasionally, often*). At this level of generality there is more elasticity in "hard science" than we are sometimes led to believe (cf. Halliday & Martin [1993], Martin & Veel [1998] on science discourses).

Danger (reporting)

Significantly, the report on rainforests focuses on flora; it doesn't mention the animals that live there. The rainforest is thus constructed as a habitat, rather than an ecosystem; and linking material is needed to connect inhabitants such as jaguars, gorillas, and orangutans to their home. Suitable bridging material is presented in text 7 below, which focuses on fauna and their possible extinction.

Victims Under Threat

Text 7. At one time overhunting was the greatest threat to animals. Since 1600 78 mammals and 94 birds have become extinct. At least one third were wiped out by hunting. Although overhunting is still a serious threat, the destruction of the habitat has become more important. Extinct animals can never be brought back to life. For every species of animal which has been wiped out by man, there are many more which are endangered.

Animals need to be conserved not just because they are beautiful or unusual. The survival of all species, including people, depends upon the maintenance of a wide range of native species in their natural habitat. Survival of species is not a competition between people and animals—it is a matter of living together, with people conserving and managing natural environments to ensure that native species continue to play their roles in the world we all share. These following animals are but a mere few of the species currently battling extinction.

This text begins as a report on threatened fauna, and so configures meanings along the lines outlined for texts 3-6. But in 7 an additional voice is heard—a voice that goes beyond what is to argue for what should be done (the thesis being *Animals need to be conserved...*); its rhetoric is outlined below (Martin, 1985).

[since]

At one time overhunting was the greatest threat to animals. Since 1600 78 mammals and 94 birds have become extinct. At least one third were wiped out by hunting. Although overhunting is still a serious threat, the destruction of the habitat has become more important. Extinct animals can never be brought back to life. For every species of animal which has been wiped out by man, there are many more which are endangered.

[therefore]

Animals need to be conserved

[not just because]

they are beautiful or unusual.

[but in addition because]

The survival of all species, including people, depends upon the maintenance of a wide range of native species in their natural habitat.

[the point is that]

Survival of species is not a competition between people and animals

[rather]

it is a matter of living together, with people conserving and managing natural environments to ensure that native species continue to play their roles in the world we all share.

[to reinforce this argument, consider]

These following animals are but a mere few of the species currently battling extinction.

This expository voice involves denying misconceptions and replacing them with alternative views:

Animals need to be conserved not just because they are beautiful or unusual. [rather] The survival of all species, including people, depends upon the maintenance of a wide range of native species in their natural habitat.

Survival of species is not a competition between people and animals— [rather] it is a matter of living together, with people conserving and managing natural environments to ensure that native species continue to play their roles in the world we all share.

And it involves realigning expectations, by conceding positions and then moving on.

Although overhunting is still a serious threat, the destruction of the habitat has become more important. (par 1)

These following animals are but a mere few of the species currently battling extinction [in case you didn't realise there were many more].

Alongside these direct engagements with the reader, text 7 makes use of considerable amplification to highlight danger—including highly charged lexis (*victim, wiped out, battling*) and intensification (*greatest threat, serious threat, more important, every species, no more, all species, wide range, we all*). As a result of this persuasive discourse what begins looking like a report ends up as exposition. Although the proposal that animals need to be conserved is pivotal, in general the features of the two genres spread across the text in such a way that it is hard to separate one from the other. The text blends report with exposition, as it both introduces fauna under threat and argues for their survival. Some might refer to blended texts of this kind as “mixed genres”⁷ (Kress & Threadgold, 1988; Threadgold, 1997).

In the student writing we are exploring here, text 7 in fact functions as the introduction to texts 3-5 (and an additional report on butterflies we have not considered). And I should now confess that none of 3-5 were written quite as I presented them before. In fact, each text continued on from the canonical report outlined above to deal with threats to the species, as underlined in 3' and 4' below.

The Jaguar

Text 3'. In South America, the jaguar is the greatest of the hunters and its vantage point is a tree, the jaguar leaps onto its unsuspecting prey. Ranging to eight feet in length and 125 to 120 pounds in weight, the jaguar is the largest of all the cats. It is stocky, muscled body, short legs

and massive chest make the jaguar a powerful and efficient hunter. Although the jungles of Brazil form the centre of the jaguar's homeland they have been spotted as far away as Mexico.

Through its range, the jaguar adapts to many habitats from the swampy marshes to the stifling rainforests. The jaguar is also a good climber but does most of its hunting on the ground. Deer, tapir, peccary and toucans are frequent victims but the big cat is also fond of fish.

Jaguars have always been prized for their beautiful spotted coats. For many years the jaguar skins were exported annually to the fur markets of the world. In recent years some 23,000 were exported. Many South American countries now protect the jaguar, but unfortunately the big cat can still be legally hunted even where they have already become endangered. In the Amazon Basin, its last stronghold, it is threatened today not only by hunting, but by the loss of suitable habitat as the rainforest is being opened up to timbering, farming, livestock raising and other human activities.

Gorilla

Text 4'. The gorilla is commonly known as the gentle giant of the rainforest. The biggest of the apes, sometimes reaching a weight of 300 kilograms and a height of 1.75 metres. The gorilla is quite a friendly creature unless threatened or provoked.

The rainforests which these gorillas inhabit supply all the fruits and plants they need, *but the troubling thing is that these forests are shrinking because the land is continually being cleared for farming. Many of these are sold to zoos or hunted for their fur and paws. As a result, their numbers have dropped alarmingly.*

Today the gorillas number only a few thousand, while there are fewer than 400 mountain gorillas.

In zoos and wildlife parks it has taken more than a hundred years for the first of these animals in captivity and with the raising of animals being so difficult it will not be easy to try and restock the wild.

Neither of these texts is as argumentative as text 7. There are no explicit exhortations presented and justified (comparable to “animals need to be conserved because the survival of all species depends on it”), and no comparable replacement of misconceptions. But both reports explicitly construct the writer's attitude to what is going on (*unfortunately, troubling, alarming-ly*); and expectations are realigned (*still, even, already, not only... but, only*). Perhaps what we are considering here is not so much a blend of report with exposition as an adaptation of the report genre, which here includes consideration of the survival of the species. Threats to the survival of a species naturally attract an emotional response and beg the question as to how extinction can be avoided. Thus the adaptation expands the configuration of meanings canonically associated with the genre, with new “green” meanings to enhance

⁷It might be clearer, however, to use the term “mixed text” to refer to texts that blend genres, reserving the term genre for generalizations about the recurrent configurations of meaning upon which texts draw.

the facts construed (Martin, 1986; Veel, 1998). In Australia, we may even have arrived at the point where the canonical structure of the genre in school science and geography needs to be reconsidered, and presented to students in its "greened" discursive form.

Destruction (explaining)

Survival depends on understanding danger, both with respect to current threats and with respect to how things got to the state they're in. So even though geography is canonically concerned with space rather than time, a more historical perspective does serve the interests of the greening discourse we're exploring here. Our writer does in fact provide a relevant historical account (Coffin 1996, 1997; Veel & Coffin, 1996), explaining extinction as follows:

Why Animals are Extinct

Text 8. Man has been making animals rare and even extinct for thousands of years, and one of the main ways man has achieved this is by the destruction of their habitat. The destruction of a habitat means that the vital balance between an animal and its environment is disturbed. In ancient times the destruction of habitat and the extinction of animals was quite small. Since then it has rapidly increased. People began to make more use of machines and industrialisation occurred bringing with it changes which would destroy the face of the earths environment forever. As the demands grew wood and later coal, supplied the resources needed, this in turn resulted in the destruction of forests and habitats. At the same time that industrialisation was taking place humans were settling in new parts of the world. Whenever they settled, nests were cut down and farms established. This destroyed the habitat of many animals.

The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife and still is today already half the worlds tropical rainforests have already been destroyed or irreversibly damaged. This reckless ravaging of some of the most amazing habitats on earth means that by the year 2000 the destruction will be complete and the world will be without these areas.

As might be expected, explaining changes over very long periods of time mobilizes a configuration of meanings complementary to those discussed above. Text 8 begins by announcing that it will reconstruct thousands of years of habitat destruction, continues by providing that reconstruction, and concludes by summarizing the extent of the damage (Martin, 1993). This presentational and temporal scaffolding is outlined below (with chronological markers underlined):

[looking forward]

Man has been making animals rare and even extinct for thousands of years, and one of the main ways man has achieved this is by the destruction of their habitat. The destruction of a habitat means that the vital balance between an animal and its environment is disturbed.

In ancient times the destruction of habitat and the extinction of animals was quite small.

Since then it has rapidly increased. People began to make more use of machines and industrialisation occurred bringing with it changes which would destroy the face of the earths environment forever.

As the demands grew wood and later coal, supplied the resources needed, this in turn resulted in the destruction of forests and habitats.

At the same time that industrialisation was taking place humans were settling in new parts of the world.

Whenever they settled, nests were cut down and farms established.

This destroyed the habitat of many animals.

[summing up]

The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife and still is today already half the worlds tropical rainforests have already been destroyed or irreversibly damaged. This reckless ravaging of some of the most amazing habitats on earth means that by the year 2000 the destruction will be complete and the world will be without these areas.

The text is very heavily nominalized (Halliday, 1998; Halliday & Martin, 1993), much more so than the report and recount genres discussed above. This enables it to cover thousands of years of destruction in just a few clauses. Vast realms of activity are named, and once named, begin and continue to occur:

the destruction of habitat and the extinction of animals was quite small
it [destruction/extinction] has rapidly increased
industrialisation occurred
the demands grew
industrialisation was taking place

Once named, they also affect other nominalizations ("industrialisation bringing change") and abstractions ("change destroying environment"):

[industrialisation] bringing with it [industrialisation] changes
changes which would destroy the face of the earths environment forever

A closely related pattern involves not naming, but referring through demonstratives to realms of activity that have been spelled out in the preceding co-text; these anaphoric condensations then affect nominalizations ("this" resulting in destruction) and abstractions ("this" destroying habitats):

As the demands grew
wood and later coal, supplied the resources needed,
this in turn resulted in the destruction of forests and habitats.
At the same time that industrialisation was taking place
humans were settling in new parts of the world.
Whenever they settled,
nests were cut down
and farms established.
This destroyed the habitat of many animals.

The same patterns enable even greater concentrations of abstract causality in the text's introduction and conclusion, where it is needed to predict and summarize (cf. Martin, 1993).

Man has been making animals rare and even extinct for thousands of years, and one of the main ways man has achieved this is by the destruction of their habitat. The destruction of a habitat means that the vital balance between an animal and its environment is disturbed . . .

The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife and still is today already half the worlds tropical rainforests have already been destroyed or irreversibly damaged. This reckless ravaging of some of the most amazing habitats on earth means that by the year 2000 the destruction will be complete and the world will be without these areas.

Throughout the text, the effect of these wordings is to realize causality inside clauses (rather than between them via connectives such as *therefore, because, or so*). Prepositions (*by, due to*), nouns (*ways, effects*) and verbs (*making, achieved, bringing, destroy, resulted in, affected, means*) are used to relate cause and effect. One advantage of this texture for historians is that people, places, and things, abstractions and nominalizations can be related through a delicate repertoire of causal relations many times larger than that available for connecting clauses to one another (Martin, 1992); another advantage is that it makes room between clauses for temporal connections, as outlined above.

- one of the main ways man has achieved this is by the destruction of their habitat.
- the need of more land due to the growth of population
- Man has been making animals rare and even extinct
- man has achieved this [making animals rare and even extinct]
- [industrialization] bringing with it changes
- changes which would destroy the face of the earths environment
- this [demand for resources] ... resulted in the destruction of forests and habitats
- This destroyed the habitat of many animals.
- The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife
- [industrialization/need of more land] still is [affecting wildlife] today
- The destruction of a habitat means that the vital balance between an animal and its environment is disturbed.
- This reckless ravaging of some of the most amazing habitats on earth means that by the year 2000 the destruction will be complete and the world will be without these areas.

Survival (advocacy)

What a mess we're in! How to get out of it? For this our writer deploys a fully fledged expository genre, urging appropriate remedies . . .

The Solution

Text 9. The world's remaining rainforests could disappear in one human lifetime. The advanced nations of the world must set the example and develop a growing realisation of the necessity for preserving wild ecosystems and for saving the natural areas that are vital to the well-being of countless species of wildlife and plants. They need to introduce protective laws to help threatened species such as jaguars. The importance of ecology and the living world needs to be incorporated into the education of the young people.

Governments need to curb needless and wasteful use of the Earth's natural resources. They must continue to extend agricultural and scientific knowledge to the underdeveloped nations such as those in Latin America.

Rainforests are lands of immense potential with great opportunities for the development of timber industries, agriculture, mining, forestry

and forest products. However in the rush to achieve short-term advancement and to provide food for the evergrowing population in the world, they will ultimately cause long-term, irreparable damage. To chop down a forest for a quick sale of timber is a shortsighted view. Logging should be controlled to level within the productive capacity of the forest and the human population growth must be checked so that pressure for landuse is eased. It is essential that we support the research for landuse is strive for balance between both man and nature.

As far as abstraction is concerned, this text draws on resources similar to those deployed in the historical account reviewed above (text 8). Nominalizations "achieve" nominalizations; and institutions "cause" nominalizations:

However in the **rush** to achieve short-term **advancement** and to provide food for the **evergrowing** population in the world, they [timber industries, agriculture, mining, forestry] will ultimately cause long-term, **irreparable damage**.

Alongside the voice of explanation however is the voice of advocacy (Martin, 1995a). The text is heavily modalized with verbs (*could, must, need, needs, need, must, should, must*) and related nominals (*necessity, vital, need-less, potential, opportunities, irreparable, capacity, essential*) concerned with what can and should be done:

Text 9. The world's remaining rainforests **could** disappear in one human lifetime. The advanced nations of the world **must** set the example and develop a growing realisation of the **necessity** for preserving wild ecosystems and for saving the natural areas that are **vital** to the well-being of countless species of wildlife and plants. They **need** to introduce protective laws to help threatened species such as jaguars. The importance of ecology and the living world **needs** to be incorporated into the education of the young people.

Governments **need** to curb **needless** and wasteful use of the Earth's natural resources. They **must** continue to extend agricultural and scientific knowledge to the underdeveloped nations such as those in Latin America.

Rainforests are lands of immense **potential** with great **opportunities** for the development of timber industries, agriculture, mining, forestry and forest products. However in the rush to achieve short-term advancement and to provide food for the evergrowing population in the world, they will ultimately cause long-term, **irreparable** damage. To chop down a forest for a quick sale of timber is a shortsighted view. Logging **should** be controlled to level within the productive **capacity** of the forest

and the human population growth **must** be checked so that pressure for landuse is eased. It is **essential** that we support the research of those people who strive for balance between both man and nature.

Alongside telling us what to do, the text justifies its appeal by drawing on an evaluative lexis that positions us in specific ways to sympathize with the writer's position. Let's work our way into this lexical positioning by returning to the summative evaluation of the historical account (text 8):

... The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife and still is today already half the worlds tropical rainforests have already been destroyed or irreversibly damaged. This **reckless ravaging of some of the most amazing habitats on earth** means that by the year 2000 the destruction will be complete and the world will be without these areas.

Here, the effect of industrialization and population growth on rainforests is summed up as *this reckless ravaging of some of the most amazing habitats on earth*. The nominal group⁸ is strongly amplified (*reckless, ravaging, most amazing*), reinforcing the negative evaluation; and it evaluates the "ravaging" as reckless—as utterly careless of the consequences of what was going on. It is instructive to contrast this negative evaluation with alternatives, which might have drawn on complementary interpretive frames; for example the normality of what was going on, the capacity of those responsible, or their veracity, or propriety. Contrast...

[normality] This **extraordinary** ravaging of some of the most amazing habitats...

[capacity] This **uninformed** ravaging of some of the most amazing habitats...

[tenacity] This **reckless** ravaging of some of the most amazing habitats...

[veracity] This **hypocritical** ravaging of some of the most amazing habitats...

[propriety] This **immoral** ravaging of some of the most amazing habitats...

A general framework for interpreting judgments of this kind is presented in Martin (1999). Our student writer attributes "ravaging" to carelessness, rather than to behavior we might think of as abnormal, ignorant, dishonest,

⁸Note that it is the nominalization ("ravaging") that enables the evaluation, as English resources for judging behavior are concentrated in the nominal group.

est, or immoral. This implies, of course, that if we were more careful, then rainforests (and life as we know it) might yet be saved.

In text 9, a related rhetoric of evaluation is deployed to align readers. The key terms in this process are analyzed below, reflecting my reading⁹ of the text, taking the terms *needless*, *wasteful*, *short-term*, and *shortsighted* as establishing a motif of recklessness that the writer wants readers to turn around.

Text 9. The world's remaining rainforests could disappear in one human lifetime. The **advanced** [capacity/positive] nations of the world must set **the example** [tenacity/positive] and develop a growing realisation of the necessity for preserving wild ecosystems and for saving the natural areas that are vital to the **well-being** [capacity/positive] of countless species of wildlife and plants. They need to introduce **protective** [propriety/positive] laws to help **threatened** [normality/negative] species such as jaguars. The importance of ecology and the living world needs to be incorporated into the education of the young people.

Governments need to curb **needless** [tenacity/negative] and **wasteful** [tenacity/negative] use of the Earth's natural resources. They must continue to extend agricultural and scientific knowledge to the **underdeveloped** [capacity/negative] nations such as those in Latin America.

Rainforests are lands of immense potential with great opportunities for the development of timber industries, agriculture, mining, forestry and forest products. However in the rush to achieve **short-term** [tenacity/negative] advancement and to provide food for the evergrowing population in the world, they will ultimately cause **long-term** [normality/negative], **irreparable** [normality/negative] damage. To chop down a forest for a quick sale of timber is a **shortsighted** [tenacity/negative] view. Logging should be controlled to level within the productive capacity of the forest and the human population growth must be checked so that pressure for landuse is eased. It is essential that we support the research of those people who strive for **balance** [propriety/positive] between both man and nature.

It might be useful at this point to contrast this evaluative stance with an alternative that argues that unethical behavior rather than carelessness is responsible for the damage to rainforests (with *unethical*, *greedy*, *insensitive*, and *corrupt* replacing *needless*, *wasteful*, *short-term*, and *shortsighted*). The switch from social esteem to social sanction makes the text more severe in the

⁹For this reading I've taken the local context of terms into account. For example, although "short-term" and "long-term" are antonyms, I've treated "short-term advancement" as realizing negative tenacity (carelessness) but "long-term...damage" as realizing negative normality (excess). Similarly, "people who strive for balance" is read as positive propriety (caring).

way it assigns blame for "ravaging"; in text 9' the solution has to do with morality (as opposed to being just a little more careful).

Text 9'. The world's remaining rainforests could disappear in one human lifetime. The **advanced** [capacity/positive] nations of the world have a **moral obligation** [propriety/positive] to develop a growing realisation of the necessity for preserving wild ecosystems and for saving the natural areas that are vital to the **well-being** [capacity/positive] of countless species of wildlife and plants. They need to introduce **protective** [propriety/positive] laws to help **threatened** [normality/negative] species such as jaguars. The importance of ecology and the living world needs to be incorporated into the education of the young people.

Governments need to curb **unethical** [propriety/negative] and **greedy** [propriety/negative] use of the Earth's natural resources. They must continue to extend agricultural and scientific knowledge to the **underdeveloped** [capacity/negative] nations such as those in Latin America.

Rainforests are lands of immense potential with great opportunities for the development of timber industries, agriculture, mining, forestry and forest products. However in the rush to achieve **insensitive** [propriety/negative] advancement and to provide food for the evergrowing population in the world, they will ultimately cause **long-term** [normality/negative], **irreparable** [normality/negative] damage. To chop down a forest for a quick sale of timber is a **corrupt** [propriety/negative] practice. Logging should be controlled to level within the productive capacity of the forest and the human population growth must be checked so that pressure for landuse is eased. It is essential that we support the research of those people who strive for **balance** [propriety/positive] between both man and nature.

In the original text, of course, it is the recklessness motif that in a sense absolves readers from their past and opens the way for them to care—to introduce protective laws and to strive for a balance between man and nature. Which readers? Readers, it would appear, from advanced countries, who educate their young about ecology, vote for governments that conserve resources, spread the word to underdeveloped countries, and foster research. What kind of solution is this? One that completely ignores the political and ultimately economic interests responsible for past ravaging, the very interests that will continue ravaging as long as global capitalism determines our relations with one another and the ecosystem we share? Probably. What kind of depoliticized greening is this? Will it save the planet? Plenty to think about here.

The critical point is that the writer is aligning readers with respect to values; the text is telling you what to do and why, with respect to what you believe in. And evaluation of this kind is a feature of green discourse in general. It moves beyond the objective face of physical geography (and science)

to construct a much more overtly politicized position. As it does so, we need to look very carefully at the values to which green geography or science subscribe. The fact that green discourse has worked its way so quickly through the mainstream curriculum should give us pause—to ask what kinds of depoliticization have taken place. A generation that simply tries to be more careful is probably not exactly what our planet needs.

From Little Things, Big Things Grow

Perhaps at this point I should come clarify the global structure of the writing under discussion here. Entitled *Endangered Species*, it was written by a Year 8 student,¹⁰ as homework in 1991. Its scaffolding is outlined below, using the writer's own headings; subsections have been cross-referenced to their numbering as exemplars above.

Contents
Rainforest (text 6)
Why animals are extinct (text 8)
Victims under threat (text 7)
The Jaguar (text 3')
Gorilla (text 4')
Orangutan (text 5 and "green" extension)
Butterfly
The Solution (text 9)
Bibliography

In addition the text included seven images (six photos of rainforest animals, and a map of equatorial and tropical rainforest ecosystems). Overall, then, the student's text was a multimodal macrogenre, drawing on four different genres and two types of image. For reasons of space, I will not deal with images here; for relevant discussion of them see van Leeuwen (1992), van Leeuwen and Humphrey (1996), and Veel (1998). Martin (1995b) discusses the structure of macrogenres, drawing on general semantic variables proposed in Halliday (1994). These include elaboration, where meanings are restated, clarified, or exemplified in different words (=); extension, where meanings are accumulated, as additions, alternatives, or contrasts (+); enhancement, where meanings qualify one another with respect to time, place, manner, cause, or condition (x); and projection, where meanings act as the source of others by quoting or reporting them (").

In these terms, the verbal text consists of the title, which is elaborated by the table of contents, which is in turn elaborated by the rest of the

macrogenre; next comes the report on rainforests, which is extended by the historical account of why animals are extinct, extended by an included macrogenre introduced by the report/exposition on victims under threat, itself elaborated by four reports (the jaguar report, extended by the gorilla report, extended by the orangutan report, extended by the butterfly report); the overall macrogenre is then enhanced by the exposition explaining what needs to be done, and concludes with references sourcing the ideas presented in the text. The macrogenre also includes six images exemplifying endangered species, and a map extending the report on rainforests by cartographically locating them. An outline of this structure is presented below.

ENDANGERED SPECIES	Title
= [image of jaguar]	
CONTENTS	= Table of contents
= [image of Blue & Yellow Macaw facing extinction in the Caribbean]	= [REPORT]
RAINFOREST	
...	
WHY ANIMALS ARE EXTINCT	+ [HISTORICAL ACCOUNT]
+ [map of equatorial and tropical rainforest ecosystems]	
...	
VICTIMS UNDER THREAT	+ [REPORT/EXPOSITION]
...	
THE JAGUAR	= ([REPORT])
= [image of jaguar]	
...	
GORILLA	+ [REPORT]
...	
= [image of mountain gorilla]	
ORANGUTAN	+ [REPORT]
...	
= [image of orangutan]	
BUTTERFLY	+ [REPORT]
...	
= [image of butterfly]	
THE SOLUTION	x [HORTATORY EXPOSITION]
...	
Bibliography	" [references]
...	

¹⁰Age 13/14 years in the New South Wales system.

This is a lot of meaning. It took a lot of meaning to do the job, more than could be managed by a canonical report on, say, rainforests or jaguars (cf. Cazden, 1996; Schleppegrell, 1998). To construct this "greened" discourse, the student used a renovated report genre, including consideration of endangerment; the student also composed a hybrid report and exposition genre, to introduce endangered animals and urge conservation; and the student assembled these into a macroreport, along with an additional historical and expository genre, and seven images, to get the message across. Environmentalism has recontextualized canonical geography, as reflected in the renovation, hybridization, and multimodal assemblage reviewed here.

Note in passing that the term "mixed genre" is less than helpful as a characterization of discourse of this kind. For one thing, it confuses system and instance (Halliday & Matthiessen, 1999). In order to mix genres, we need something "canonical" to mix. Accordingly we need to distinguish genre (system) from text (instantiation)—to distinguish recurrent configurations of meaning immanent in our culture from the textual instances that draw on one or more of them to reinforce these configurations or nudge the culture along. For another, the ways in which texts can draw on genres is varied, and a single cover term like "genre mixing" draws attention away from this variation. Above, we considered renovation, hybridization, multimodality, and macro-generic assemblages—all very different ways of "combining" genres. Other possibilities include embedding, where one genre functions as a stage in another (Martin, 1995b), and contextual metaphor, where one genre stands in for another (e.g., children's stories as scientific explanations; Martin 1990, 1997a, 1997b). The range of variation¹¹ reflects the diversity of social factors at play; to study change we need a rich model, not a reductive one.

As discussed above, however, the range of meaning instantiated here does have its limitations. The notion that human carelessness is responsible for extinction is just one reading. In this respect, critical theorists might well regard the text as insensitive to the economics and politics of environmental degradation; it is just not deconstructive enough. Beyond this, the text places endangered animals in their rainforest habitat, but does not attend to the inter-

¹¹The range of variation will come as no surprise to functional grammarians, who deal regularly with renovation ("Don't disappear that overhead!"), blends ("It is stocky, muscled body, short legs and massive chest make the jaguar a powerful and efficient hunter."), multimodality ("3 of them went POW!"), clause complexing ("Yes, but Anna will probably always be a bit shorter than you, 'cos Anna's Mummy and Daddy are much shorter than Mummy and Daddy, so Anna will probably never be as tall as you even when she's grown up."), embedding ("Factors [favourable to the development of the true tropical rainforest] are annual rainfall amounts in excess of 1500mm.") and grammatical metaphor ("The effects of industrialisation and the need of more land due to the growth of population seriously affected wildlife and still is today"); Halliday (1994), Matthiessen (1995), Martin et al. (1997).

action of flora and fauna in this habitat as an ecosystem. For this it would have drawn on a range of explanation genres that focus on such interaction; that is, some of the sequential explanations, causal explanations, theoretical explanations, factorial explanations, consequential explanations, and explorations discussed in Veel (1992, 1995) and Unsworth (1997a, 1997b, 1998) (for related teaching materials see Humphrey, 1996; Humphrey & Takans, 1996; Sikes & Humphrey, 1996). In this respect, ecologists might well regard the text as inadequate,¹² because the understandings needed to effect change are not provided. One is left with the suspicion that green geography is simply canonical geography supplemented by the right kinds of attitude, expressed in discourse that asserts values and urges change—a co-option of ecology in place of genuine renovations and their implications for changes to our contemporary political and economic order. Whose geography, we have to ask, is this?

Envoi

Summing up the effects of environmentalism on Australian secondary school science, Veel (1998, p. 140) comments as follows:

Environmentalism, being an ideology, mobilises both the resources of humanities rhetoric and scientific knowledge. It is this merging of the scientific and the rhetorical in the written mode which characterises the language of environmentalism. It allows writers both to mobilise the kinds of technical meanings made possible by scientific discourse, and simultaneously to explore the issue of the relationship between humans and the environment, presenting the reader with propositions about humans and the environment and making proposals for action.

As was shown in the text discussed above, environmentalism has had a closely related impact on school geography. Humphrey (1996, pp. 1-2) notes that the junior secondary syllabus informing texts 3-9 includes outcomes requiring that students "demonstrate a commitment to improve environmental quality, make predictions about the consequences of environmental change, explain interaction between communities and environments, assess the impacts of an international or global issue on Australian communities, and interpret and critically examine video and print media material." To achieve these outcomes, scientific and rhetorical discourse have to be reconciled; and as Veel (1998, p. 140) notes, this "requires a sophisticated control over a large number of linguistic resources in the written mode."

¹²Veel (1998, pp. 121-122) distinguishes two strands of environmentalism—the romantic and the scientific/rationalist; the romantic seems to have won out over the rationalist here.

As far as genre is concerned, reconciliation would seem to depend on the ability to draw on a range of genres, some typifying traditional science discourse (i.e., report and explanation), others traditional humanities discourse (historical account and exposition). And as noted above, a variety of strategies for reconciling science with humanities are available, including renovation, hybridization, multimodality, macrogenerativity, embedding, and metaphor. I would insist that all of these strategies ultimately depend on controlling canonical variables. If you don't control the genres you're drawing on, you won't be able to marshal them effectively in multimodal macrogenres that resolve the complementary voices of the geography syllabus. Seen in these terms, the text reviewed shows promise, but has some gaps. Ideally, by the end of junior secondary school, green and canonical voices would be better reconciled.¹³

Is discourse all that matters? Is writing really going to save the world? Obviously there is more than writing going on. As Veel notes, green discourse has given rise to complex multimodal texts in which writing and images interact in new ways. And these texts are just one part of classroom activity (Christie, 1996), which involves action alongside language and imaging. And this activity is itself contextualized by physical and biological processes around and beyond our world (Lemke, 1995). With so much social and material context to deal with, what is to be done?

One solution is the interdisciplinary one. To cover relevant ground linguists cooperate with critical and cultural theorists, educators, geographers, scientists, and so on to renovate curricula. Talking across disciplines is a problem; but where consolidating agendas are available, such as feminism or environmentalism, then dialogue is possible. And useful work can be done, together. The alternative solution is transdisciplinary and involves disciplines building their own models of what other disciplines are interested in. For example, activity theorists (I'm thinking here of the Mind Culture Activity federation around Cole and Wertsch) cover language by treating it as a kind

¹³For discussion of a more successful text from Year 11 that draws on report, explanation, and exposition genres, see Lee and Green (1990), Green and Lee (1994), Lee (1996). Lee (1996, p. 163) in fact considers this text to have moved beyond reconciliation to a postenvironmentalist stance (see also Lee, 1993, 1997; Unsworth, 1997c). Unfortunately, Lee's attendant critique of language in education work informed by functional linguistics is a virtual one, based on fears about imagined implementations of Wignell et al. (1990). For the record, Wignell et al. focused on canonical physical geography in order to complement parallel research into the canonical discourse of history (Eggs et al., 1993), as part of our initial efforts to deconstruct the secondary school curriculum; classroom interventions were based on several years further research in the Disadvantaged Schools Program's Write it Right Project, which ran from 1990 to 1996 (for a sampling of this research see Christie & Martin, 1997; for related teaching materials see Coffin, 1996, and Humphrey, 1996, on history and geography respectively).

of activity (Kamberelis & Bovino, 1999; Russell, 1997; Wells, 1994, 1996); functional linguists¹⁴ on the other hand cover activity by treating it as a kind of meaning (Martinec, 1998) and similarly cover image (Callow, 1996; Kress & van Leeuwen, 1996; O'Toole, 1994) and sound (van Leeuwen, 1999). The advantage of the transdisciplinary perspective is that it uses a common meta-language across inquiries, and this fosters dialogue in a way that political agendas may not. My own interest is in transdisciplinary initiatives (e.g., Christie, 1998; Cope & Kalantzis, 1999; Martin & Veel, 1998; The New London Group, 1996; Unsworth, 1999; cf. Hyon, 1996; Miller, 1984); the closer we get to Lemke's notion (e.g., 1995) of an ecosocial semiotic transdiscipline, the closer we'll be to enacting our theories in ways that matter to us and the various politics in which we are engaged.

Green geography. It's happening. Even as this text unfolds. Can it be more than attitude—more than caring and urging change? Let's hope so. We need romantic rationality and more to see this planet through!

REFERENCES

- Callow, J. (1999). *Image matters: Visual texts in the primary classroom*. Sydney: PETA.
- Cazden, C. (1996). A report on reports: Two dilemmas of genre teaching. In F. Christie & J. Foley (Eds.), *Literacy in mother tongue teaching* (pp. 248-265) (Mother Tongue Education Research Series 2). New York: Waxman.
- Christie, F. (1996). *An ARC study in the pedagogic discourse of secondary school social sciences-Report 1: Geography*. Melbourne: Faculty of Education, University of Melbourne.
- Christie, F. (Ed.). (1998). *Pedagogy and the shaping of consciousness: Linguistic and social processes*. London: Cassell.
- Christie, F., & Martin, J.R. (1997). *Genre and institutions: Social processes in the workplace and school*. London: Cassell.
- Coffin, C. (1996). *Exploring literacy in school history*. Sydney: Metropolitan East Disadvantaged Schools Program. [Bridgeway & Swanson St., Erskineville, NSW, Australia]
- Coffin, C. (1997). Constructing and giving value to the past: An investigation into secondary school history. In F. Christie & J.R. Martin (Eds.), *Genre and institutions: Social processes in the workplace and school* (pp. 196-230) (Open Linguistics Series). London: Cassell.

¹⁴See also Matthiessen (1998), Halliday and Matthiessen (1999) on cognition as meaning.

- Cope, W., & Kalantzis, M. (Eds.). (1993). *The powers of literacy: A genre approach to teaching literacy*. London and Pittsburgh: Falmer and University of Pittsburgh Press.
- Cope, B., & Kalantzis, M. (1999). *Multiliteracies: Literacy learning and the design of social futures*. London: Routledge.
- Eggs, S., Wignell, P., & Martin, J.R. (1993). The discourse of history: Distancing the recoverable past. In M. Ghadessy (Ed.), *Register analysis: Theory and practice* (pp. 75-109). London: Pinter.
- Green, B., & Lee, A. (1994). Writing geography lessons: Literacy, identity and schooling. In A. Freedman & P. Medway (Eds.), *Learning and teaching genre* (pp. 207-224). Portsmouth, NH: Boynton/Cook (Heinemann).
- Halliday, M. A. K. (1994). *An introduction to functional grammar*. London: Edward Arnold.
- Halliday, M. A. K. (1998). Things and relations: Regrammaticising experience as technical knowledge. In J.R. Martin & R. Veel (Eds.), *Reading science: Critical and functional perspectives on discourses of science* (pp. 185-235). London: Routledge.
- Halliday, M. A. K., & Martin, J.R. (1993). *Writing science: Literacy as discursive power*. London: Falmer.
- Halliday, M. A. K., & Matthiessen, C. M. I. M. (in press). *Constructing experience through language: A language-based approach to cognition*. London: Cassell.
- Horvath, B. (1985). *Variation in Australian English: The sociolects of Sydney* (Cambridge Studies in Linguistics 45). Cambridge: Cambridge University Press.
- Humphrey, S. (1996). *Exploring literacy in school geography*. Sydney: Metropolitan East Disadvantaged Schools Program. [Bridge & Swanson St., Erskineville, NSW, Australia]
- Humphrey, S., & Takans, P. (1996). *Explaining the weather: A unit of work for Junior Secondary Geography*. Sydney: Metropolitan East Disadvantaged Schools Program.
- Hyon, S. (1996). Genre in three traditions: Implications for ESL. *TESOL Quarterly*, 30(4), 693-722.
- Kamberelis, G., & Bovino, T. D. (1999). Cultural artifacts as scaffolds for genre development. *Reading Research Quarterly*, 34(2), 138-170.
- Kress, G., & Threadgold, T. (1988). Towards a social theory of genre. *Southern Review*, 21(3), 215-243.
- Kress, G., & van Leeuwen, T. (1996) *Reading images: The grammar of visual design*. London: Routledge.
- Lee, A. (1993). Whose geography? A feminist-poststructuralist critique of systemic "genre"-based accounts of literacy and curriculum. *Social Semiotics*, 3(1), 131-156.
- Lee, A. (1996). *Gender, literacy, curriculum: Re-writing school geography*. London: Taylor & Francis.
- Lee, A. (1997). Questioning the critical: Linguistics, literacy and curriculum. In S. Muspratt, A. Luke, & P. Freebody (Eds.), *Constructing critical literacies: Teaching and learning textual practice* (pp. 409-432). Sydney: Allen & Unwin.
- Lee, A., & Green, B. (1990). Staging the differences: On school literacy and the socially-critical curriculum. In R. Giblett & J. O'Carroll (Eds.), *Discipline dialogue-difference: Proceedings of the Language in Education Conference, Murdoch University, December 1989* (pp. 225-261). Perth: 4D Duration Publications, School of Humanities, Murdoch University.
- Lemke, J. (1994). Discourse, dynamics and social change. *Cultural Dynamics*, 6(1), 243-275.
- Lemke, J. (1995). *Textual politics: Discourse and social dynamics*. London: Taylor & Francis.
- Linde, C., & Labov, W. (1975). Spatial networks as a site for the study of language and thought. *Language*, 51, 924-939.
- Martin, J. R. (1985). *Factual writing: Exploring and challenging social reality*. Geelong, Vic.: Deakin University Press. (Republished by Oxford University Press, 1989)
- Martin, J. R. (1986). Grammaticalising ecology: The politics of baby seals and kangaroos. In T. Threadgold, E. A. Grosz, G. Kress, & M. A. K. Halliday (Eds.), *Semiotics, ideology, language* (pp 225-268) (Sydney Studies in Society and Culture 3). Sydney: Sydney Association for Studies in Society and Culture.
- Martin, J. R. (1990). Literacy in science: Learning to handle text as technology. In F. Christie (Ed.), *Literacy for a changing world* (pp. 79-117). Melbourne: Australian Council for Educational Research. (Republished in M. A.K. Halliday & J. R. Martin (Eds.). (1993). *Writing science: Literacy as discursive power* (pp. 166-202). London: Falmer.)
- Martin, J. R. (1992). *English text: System and structure*. Amsterdam: Benjamins.
- Martin, J. R. (1993). Life as a noun. In M. A. K. Halliday & J. R. Martin (Eds.), *Writing science: Literacy as discursive power* (pp. 221-267). London: Falmer.
- Martin, J. R. (1995a). Interpersonal meaning, persuasion and public discourse: Packing semiotic punch. *Australian Journal of Linguistics*, 15(1), 33-67.
- Martin, J. R. (1995b). Text and clause: Fractal resonance. *Text*, 15(1), 5-42.
- Martin, J. R. (1997a). Register and genre: Modelling social context in functional linguistics-narrative genres. In E. Pedro (Ed.), *Proceedings of the First Lisbon International Meeting on Discourse Analysis*. Lisbon: Colibri/APL.

- Martin, J. R. (1997b). Analysing genre: Functional parameters. In F. Christie & J. R. Martin (Eds.), *Genre and institutions: Social processes in the workplace and school* (pp. 3-39). London: Cassell.
- Martin, J. R. (1999). Beyond exchange: Appraisal systems in English. In S. Hunston & G. Thompson (Eds.), *Evaluation in text: Authorial stance and the construction of discourse* (pp. 142-175). Oxford: Oxford University Press.
- Martin, J. R., & Veel, R. (1998). *Reading science: Critical and functional perspectives on discourses of science*. London: Routledge.
- Martin, J. R., Matthiessen, C. M. I. M., & Painter, C. (1997). *Working with functional grammar*. London: Arnold.
- Martinez, R. (1998). Cohesion in action. *Semiotica*, 120-1(2), 161-180.
- Matthiessen, C. M. I. M. (1995). *Lexicogrammatical cartography: English systems*. Tokyo: International Language Sciences Publishers.
- Matthiessen, C. M. I. M. (1998). Construing processes of consciousness: From the commonsense model to the uncommonsense model of cognitive science. In J. R. Martin & R. Veel (Eds.), *Reading science: Critical and functional perspectives on discourses of science* (pp. 327-356). London: Routledge.
- Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech*, 70, 151-167.
- O'Toole, M. (1994). *The language of displayed art*. London: Leicester University Press.
- Russel, D. (1997). Rethinking genre in school and society: An activity theory analysis. *Written Communication*, 14(4), 504-554.
- Schleppegrell, M. J. (1998). Grammar as a resource: Writing a description. *Research in the Teaching of English*, 32(2), 182-211.
- Sikes, D., & Humphrey, S. (1996). *Australia-place and space: A unit of work for junior secondary geography*. Sydney: Metropolitan East Disadvantaged Schools Program. [Bridge & Swanson St., Erskineville, NSW, Australia]
- The New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60-92.
- Threadgold, T. (1997). *Feminist poetics: Poiesis, performance, histories*. London: Routledge.
- Unsworth, L. (1997a). Scaffolding reading of science explanations: Accessing the grammatical and visual forms of specialised knowledge. *Reading*, 31(3), 30-42.
- Unsworth, L. (1997b). Explaining explanations: Enhancing scientific learning and literacy development. *Australian Science Teachers Journal*, 43(1), 34-49.
- Unsworth, L. (1997c). Book review: Lee, A. (1996). *Gender, literacy, curriculum: Re-writing school geography*. *Australian Journal of Education*, 41(3), 304-310.
- Unsworth, L. (1998). "Sound" explanations in school science: A functional linguistics perspective on effective apprenticing texts. *Linguistics and Education*, 9(2), 199-226.
- Unsworth, L. (Ed.). (1999). *Researching language in schools and communities: Functional linguistics approaches*. London: Cassell.
- van Leeuwen, T. (1992). The schoolbook as a multimodal text. *Internationale Schulbuchforschung*, 14(1), 35-58.
- van Leeuwen, T. (1999). *Speech, music sound*. London: Macmillan.
- van Leeuwen, T., & Humphrey, S. (1996). On learning to look through a geographer's eyes. In R. Hasan & G. Williams (Eds.), *Literacy in society* (pp. 29-49). London: Longman.
- Veel, R. (1992). Engaging with scientific language: A functional approach to the language of school science. *Australian Science Teachers Journal*, 38(4), 31-35.
- Veel, R. (1995). Making informed choices or jumping through hoops? The role of functional linguistics in an outcomes-based curriculum. *Interpretations*, 28(3), 62-76.
- Veel, R. (1998). The greening of school science: Ecogenesis in secondary classrooms. In J. R. Martin & R. Veel (Eds.), *Reading science: Critical and functional perspectives on discourses of science*. London: Routledge.
- Veel, R., & Coffin, C. (1996). Learning to think like an historian: The language of secondary school history. In R. Hasan & G. Williams (Eds.), *Literacy in society* (pp. 191-231). London: Longman.
- Wells, G. (1994). The complementary contributions of Halliday and Vygotsky to a "language-based theory of learning." *Linguistics and Education*, 6, 41-90.
- Wells, G. (1996). Using the tool-kit of discourse in the activity of teaching and learning. *Mind Culture Activity*, 3(2), 74-101.
- Wignell, P., Martin, J.R., & Egging, S. (1990). The discourse of geography: Ordering and explaining the experiential world. *Linguistics and Education*, 1(4), 359-392. (Republished in M. A. K. Halliday & J. R. Martin (Eds.), *Writing science: Literacy as discursive power* (pp. 136-165). London: Falmer.)