More Delicate TRANSITIVITY:

Extending the PROCESS TYPE system networks for English

to include full semantic classifications

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Summary

In this thesis, the system of TRANSITIVITY is seen as enabling us to refer to events, this type of 'experiential' meaning being manifested in the clause in the Main Verb and its extensions – which realize the ‘Process’ – and in the associated ‘Participant Roles’.

The research presented has three main aims:

1. To make it possible to generate a very wide range of types of Process for a large computational grammar. This is achieved by greatly extending the system networks for PROCESS TYPE in English. These allow us to model the paradigmatic relations between verb senses.
2. To contribute to the theory of language known as Systemic Functional Linguistics. The notions of ‘Process’, ‘system network’ and ‘delicacy’ adopted in this thesis are Systemic Functional concepts. This research builds on these ideas to extend the semantic classification of verb senses in such a way as to greatly extend the system network for TRANSITIVITY.
3. To base the system networks on data obtained from large corpora. For this purpose a new methodology has been developed which makes ‘second level’ use of corpora. This allows the researcher to store and access detailed information about large quantities of data.

The thesis has two main products:

1. A database of almost 5,400 fully analysed verb senses. This includes the most frequently occurring verb senses according to Francis et al (1996), and, unlike any other study of this kind, a high proportion of multi-word verbs.
2. Extended system networks for three major Process types in English. This includes full semantic classifications for each, in the spirit of Halliday’s concept of (1961) ‘lexis as most delicate grammar’.

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1: Introduction

1.1 The Ambiguity of 'More Delicate TRANSITIVITY'

The main title of this thesis, *More Delicate TRANSITIVITY*, is, of course, ambiguous. The question is: does *More Delicate TRANSITIVITY* mean 'TRANSITIVITY that is more delicate than existing descriptions'? Or does it mean 'a description of TRANSITIVITY that is delicate and that is offered in addition to descriptions of other delicate aspects of TRANSITIVITY'? Or could it mean both?

The answer is that it is intended to mean both. We shall see in Chapter 3, (in particular, Section 3.2), that exploratory system networks already exist that offer semantic classifications of small areas of the aspect of TRANSITIVITY[1]. But the product of this thesis is the semantic system networks of PROCESS TYPE – to be presented in Chapter 8[2] and in Appendix B – which are far fuller than any others yet developed, either within Systemic Functional Linguistics (SFL), or, so far as I am aware, outside it, both in the completeness of their coverage and in the degree of detail to which they extend, and are thus 'more delicate' than any existing description. It is clear, then, that this thesis describes *More Delicate TRANSITIVITY* in the first sense – at least with respect to the semantic classification of verbs.

There are also several other aspects of TRANSITIVITY that have already been modelled by systemic functional linguists in great detail. Firstly, the system network for PARTICIPANT ROLES (PRs) has been modelled with full delicacy in the generative computer model of English developed at Cardiff by Fawcett, Tucker and Lin (1996), and Chapter 6[3] provides the first published description of this very different aspect of 'delicate TRANSITIVITY'. Secondly, Tucker (1996b) gives a detailed description of how to handle the internal complexity of an idiomatic Process, and so, incidentally, how to handle the realization of Processes as phrasal, prepositional and phrasal-prepositional verbs – and this is another important aspect of 'delicate TRANSITIVITY'. Finally, Fawcett (1996) shows in full detail how to handle the

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[1] In Chapter 3 – 'Approaches to TRANSITIVITY in SFG' – a full description of what is meant by both TRANSITIVITY and 'delicacy' is given, as well as a full history of approaches to TRANSITIVITY in SFG. Chapter 3 also provides a description of the development of 'system' in SFG.

[2] Chapter 8 – 'PROCESS TYPE: The delicate system networks for TRANSITIVITY'.

[3] Chapter 6 – 'PROCESS TYPE and PARTICIPANT ROLES in a generative lexicogrammar'.

diverse patterns found in the complementation of verbs, this being the most complex aspect of the 'patterns' into which verbs enter (e.g. as described in Francis, Hunston and Manning 1996). The work presented here is therefore complementary to these other very 'delicate' descriptions of TRANSITIVITY, while at the same time taking the study of the semantic classification of Process types to a new level of detail. So, this thesis also describes *More Delicate TRANSITIVITY* in the second of the two senses recognised above.

The rest of this chapter has four main sections: Section 1.2 sets the scene, and places the thesis in the general areas of (a) SFL as a means of generating language and (b) explorations in the modelling of TRANSITIVITY. Section 1.3 discusses the motivation behind the work from the perspective of theory and description, of application and of methodological considerations. Section 1.4 presents the aims and scope of the thesis. And finally, Section 1.5 presents an overview of the rest of the thesis.

1.2 Setting the Scene

This thesis describes a study of verb senses in English and the two stages in modelling a central aspect of them in a generative model of English. The approach taken here is to model them in a generative computer program that makes use of the choice-centred concept of the SYSTEM NETWORK. It is argued that such system networks provide an appropriate way to integrate both 'grammar' and 'lexis' in a unified component: the 'lexicogrammar'. The central hypothesis of this thesis is that it is possible to extend the 'lexis' part of the lexicogrammar to realise what Halliday (1961) has termed 'the grammarian's dream' of 'lexis as most delicate grammar':

> 'the grammarian's dream is (and must be, such is the nature of grammar) of constant territorial expansion. He would like to turn the whole of linguistic form into grammar, hoping to show that lexis can be defined as "most delicate grammar". The exit to lexis would then be closed, and all exponents ranged in systems.' (1961/76:69).

These words are taken from Halliday's seminal paper, 'Categories of the Theory of Grammar' (1961), which was the basis for the theory that came to be known as Systemic Functional Linguistics (SFL). This theory has its basis in Firthian linguistics (the recognition of the importance of describing language in relation to its context of use, together with collocation, and the importance of the concept of 'system'), in the Prague School (the beginnings of a functional approach to grammar), and, Fawcett has suggested (2000a), in Saussurean linguistics (the maintenance of a balance between the syntagmatic versus the paradigmatic).

The notions of **system** (and system networks to which the concept of 'delicacy' (Halliday 1961) may be applied) are central both to the theory and to this thesis. The system network is a means for modelling the paradigmatic and dependency relations between features in the language. These relations allow for choices in the system network that range from more general features to more delicate features so producing a finer and finer specification, to the most delicate part of the system – and then onwards in some cases to the further specification of structure (e.g. the 'complementation' of verb senses). The system network is the theoretical representation of what Halliday terms the 'meaning potential' of language, and in the approach adopted here it constitutes the 'semantic base' for generating language.

SF theory has always drawn to some extent on real language use as the source for its development: OBSERVING what language is like to establish a theory for DESCRIBING what language is like. And this has, in turn, influenced those involved in Systemic Functional Grammar (SFG) to emphasize the real world applications of the theory. The specific application that we are most concerned with in this thesis is the relevance of SFG to designing computer programs for natural language generation[4]. Winograd (1983) describes SFG in a cognitive and generative context, and he emphasizes that, while SF was not developed with computational applications in mind, certain aspects of the theory make it particularly relevant for computational purposes. He states that while SF was based on the social rather than cognitive paradigm, 'the systemic mode of analysis has deep cognitive significance' (1983:278). And it is exactly this potential within the theory that has been brought out in the work of Fawcett, and consequently in that of those involved with him in developing the Cardiff Grammar (CG) dialect of SFG, i.e. the Cardiff SF approach. The result is a significantly different

[4] Dale, Mellish and Zock (1990:5) state that 'Systemic Functional Grammar … emphasize(s) the set of independent choices that a language generator has to make', and Fawcett (1992:630) suggests that 'systemic functional grammars lend themselves naturally to incorporation in computer models of natural language generation.'

description of language from that propounded by Halliday, and the other users of the Sydney 'dialect' of SFG.

Fawcett (1980) sets out a combinatory approach that does not separate the cognitive from the interactional, and so he proposes a 'psychosociolinguistic' model (1980:1). This approach has led naturally to the realization that the model was potentially relevant to the field of computational linguistics, and so the COMMUNAL project came into being. In particular, this thesis will be concerned with GENESYS: the sentence generation component of the project, which consists of the system networks and the realization rules of the lexicogrammar[5].

One important feature of the CG approach to the modelling of language is that it is not grammaticality that is paramount, but rather frequency of occurrence. In the generative grammar this is modelled by the probability of one feature in a system being chosen rather than another. These probabilities are based on (a) frequencies of occurrence as observed in large corpora, and (b) likelihood of occurrence, at specific points in the planning of the production of text sentences. It is the first that is the concern of this thesis.

This thesis is potentially concerned with modelling the frequency of occurrence of meanings realised through the TRANSITIVITY system. Halliday (1994:106) states that this system allows for 'constru(ing) the world of **experience** into a manageable set of process types' (my emphasis), and so it is through this system that a central portion of the 'experiential' metafunction is realized. Fawcett (1980:134) points out that in the experiential component 'the referent situation that has been formulated by the performer's problem solver for transmission to the addressee is viewed as "process", and that the term "process" is to be interpreted in a sense that includes "relationships" and "states" as well as "actions" and "changes of relationship and state".'

In terms of the work reported in this thesis, creating the system network for the 'Processes' has required a number of prior stages: the production of an unstructured list of frequently occurring verb senses in English; analysing each verb sense in the list so that it can initially be classified as belonging to one broad class of PROCESS TYPE in terms of its Participant Roles, and then further sub-classified into specific semantic

[5] This aspect of the COMMUNAL system is called GENESYS because it GENErates SYStematically.

categories that represent the scale of delicacy, and that thus constitute a semantic system network.

1.3 The Motivation Behind this Thesis

This section presents the motivations behind the work that has led to the production of both the Process Type Database (PTDB) and the extended System Network for TRANSITIVITY. There are three main strands: the 'theoretical-descriptive' motivation, the motivation of usefulness in 'practical' applications, and the motivation to improve the methodology. Indeed, the thesis is to some degree structured to reflect these separate motivational issues.

1.3.1 The Theoretical-Descriptive Motivation

The theoretical-descriptive motivation for this work is the desire to refine and to expand Halliday's notion of 'lexis as most delicate grammar' with respect to the verb senses in English. Systemic Functional theory has, throughout its history, proclaimed the aim of developing system networks that are capable of generatively integrating **grammar** and **lexis**, by combining them in a single system network with realization rules for the 'meaning potential' of this aspect of English. However, few studies have pursued this goal to the point where the resulting description is actually capable of being incorporated in a generative model of language. And those that have done so have typically been concerned with depth rather than breadth of description. (These will be described in Part 2 of Chapter 3). This thesis is therefore motivated by a desire to take up Halliday's challenge to explore the possibility of making a description of language that is so delicate 'that we can test whether there comes a place where increased delicacy yields no further systems' (1961/76:69). I have sought here to test Halliday's hypothesis by implementing, on a very large scale, system networks for the generation of Process Types in the clause.

1.3.2 The Motivation of Practical Applications

The system networks for the meaning potential of English verb senses serve as a descriptive account of the possibilities in these areas of the language. However, as we saw in Section 1.1, when implemented computationally it also serves as what Tucker (1996b) calls a 'powerful generative device, based upon the notion of choice' (Tucker, 1996b:150). This research is devoted to building a generative system network, in contrast with one that can only be used as a guide in, for example, manual text analysis. The specific goal is to model this aspect of TRANSITIVITY in a Natural Language Generation system in a computer. The thesis is strongly motivated by a need for a delicate TRANSITIVITY generation component in the COMMUNAL project. I will not go into further detail about COMMUNAL at this point (see Chapter 4) other than to say that one of its main aims is to build system networks that are 'pushed sufficiently far towards meaning to constitute the semantics, and that there is consequently no need for a higher level network that is even more 'semantic'.' (Fawcett, Tucker and Lin, (1993:123)). So the practical motivation of this thesis is to achieve this for the system networks for TRANSITIVITY, which can thus fit this 'holistic' program. (See Chapter 4 for an overview of COMMUNAL).

1.3.3 The Methodological Motivation

The methodological motivation for the thesis is to establish a viable method for producing a computer implementable classification of verb senses (i.e. the lexically realized portion of a system network) using large corpora as the evidence for the probabilities of frequently occurring items. We shall see in Chapter 7 exactly how this motivation led to the concept of using what I will term 'second level' corpus studies as the basis of a very large, and still growing, data source – the Process Type DataBase (the PTDB). It is this 'second level' use of the products of corpus studies, such as the Collins COBUILD Dictionary (1995), that this draws on to produce the 'more delicate' semantic system networks that are presented in Chapter 8.

1.4 Aims and Scope

The main aim of this thesis is therefore to describe the means for generating – from the semantic base of a system network of verb senses – the Main Verb in a clause at the level of form, and to do so in such a way that the description is integrated with all the other aspects of a fully delicate system network for TRANSTIVITY. This involves greatly extending the existing system networks for TRANSTIVITY, and so working towards the fulfilment of the 'grammarian's dream', as described above.

The achievement of this goal has in practice involved a number of sub-goals. The first is to ensure that the product of the research is able to be used as a contribution to an existing project so that it will not only be applicable but will be applied.

The second sub-goal is methodological, and it is to make use of natural language corpora in order to ensure that all conclusions are based on real language use, and so that the system networks that are produced are representative of real language in use.

Following from this, the third goal is to produce a description of this particular area of meaning that gives coverage on an unrivalled scale. It is only through aiming at a wide breadth of coverage that the research can test the robustness of the descriptive framework that it seeks to extend – and, as we shall see in Chapter 5, this work has contributed to the development of the overall framework as well as to the more delicate parts of the network. This work therefore contributes to the goals of the COMMUNAL Project, one of which is to test the model through implementation in a computer system of the CG description of English. One of the specific contributions of this research has been to test the existing configurations of Process type and associated Participant Roles (PRs) and add to them.

The goal of breadth of coverage leads logically to a final aim, which is to give a central place in the study to multi-word verbs as highly frequent items that should be central to a full model of language.

One theme of this thesis, therefore, is breadth of coverage. This necessarily leads to limitations of various types – primarily, of course, on what can be said about each verb sense or even each class of verb senses that is included. But it also means that the research is limited to the PROCESS TYPE system – so that it does not seek to contribute new ideas to the complementation patterns associated with each verb sense, (for which see Fawcett 1996), nor the other aspects of TRANSITIVITY mentioned in Section 1.1. Nor does it discuss the question of 'aspectual type' for groupings of verbs, (part of which is derivable from the broad semantic classes reorganized here but part of which is regarded in the CG as being attached to the 'event' that is realized in the clause rather than in the 'verb senses').

A final and more general point that should be made on the scope of this research is that it concerns English, and my claims do not aim to be universal.

1.5 Overview of the Thesis

Chapter 1 has provided an introduction to the work described in this thesis. It has indicated the area to which it seeks to contribute, and described the overall motivation of the work from the theoretical-description, application and methodological perspectives.

In Chapter 2, selected approaches to TRANSITIVITY are presented and discussed. The chapter starts by looking at some key studies of verbs and their associated arguments that emerged in the late 1960's, when Halliday's first articles on this subject were also published. The most notable work other than that of Halliday at this time was Fillmore (1968), and a detailed description of his proposals is given. This first section of the chapter sets the scene, and includes Chomsky's Theta Theory. The chapter then considers three large, corpus based, descriptive grammars. These are *The Comprehensive Grammar of the English Language* (Quirk et al 1985), *Pattern Grammar* (Hunston and Francis, 1999), and *The Longman Grammar* (Biber et al 1999). These descriptions provide us with an insight into grammar building that uses evidence of use. This chapter also provides a detailed critique of one very detailed treatment of a large body of verbs, i.e. Levin's *English Verb Classes and Alternations* (1993). The chapter also considers various other approaches to TRANSITIVITY from different theoretical standpoints.

Chapter 3 describes the history of the treatment of TRANSITIVITY in Systemic Functional Linguistics, and provides a critical overview of this work. Starting with Halliday's in work in the early 1960's, Chapter 3 provides a full description of the stages in the development of Halliday's approach to TRANSITIVITY, up to the publication of his *Introduction to Functional Grammar* (IFG) in 1985 and the second edition of IFG in 1994. The first half of this chapter also includes an account of scholars who provided either an overview of Halliday's work (namely Muir (1972) and Berry (1975/77)) or an alternative approach to the TRANSITIVITY of the clause (Hudson (1971) and Fawcett (1973/81 and 1980)). The second half of the chapter describes the work of those scholars who have contributed to the extension of modelling verb senses in terms of system networks (Hasan (1987) and Matthiessen (1995)) or providing alternative approaches (Tucker (1996), Davidse (1991 and 1992) and Davidse and Geyskens (1998).

Chapter 4 provides an overview of the CG. The Cardiff Grammar (CG) is the ‘dialect’ of SFG developed at Cardiff by Fawcett, Tucker, Tench, Young and others. Since it is the context for the present research, this overview provides a framework in which to place the chapters that follow. This chapter describes the main characteristics of the CG and its relationships with the COMMUNAL project, and it emphasizes the fact that the CG provides for both the generation and the analysis of language. The first half of the chapter describes the generative component of the COMMUNAL project, and the second half describes how the grammar can be used as a tool by the text analyst.

Chapter 5 provides a description of the current model of TRANSITIVITY in the CG. While this description starts from Fawcett’s earlier work (specifically, Fawcett (1980) and (1987)), the main focus is on the descriptive framework as it currently stands. The chapter describes the six Process Type categories in the CG: action, relational, mental, influential, event-relating and environmental, and it points out the contribution of the present research to the current TRANSITIVITY model in the CG.

Chapter 6 provides the first full description of the computational method for generating the Subject and Complement of a clause from the sub-networks in the TRANSTIVITY of PARTICIPANT ROLES. The chapter describes in detail the early part of the TRANSITIVITY system network into which the system networks for PROCESS TYPE presented in Chapter 8 connect. The description also draws on the products of the networks presented in Chapter 8 for the likelihood of changing the probabilities and for the realisation rules in the PROCESS TYPE system network. Thus some aspects of the description of the lexicogrammar described in this chapter have been influenced by the research presented in this thesis.

As stated in Section 1.3.3, the first stage of the methodology established in the present research was to establish a body of data as the basis for the further development of the system networks. This involves not merely data collection but also data creation, and the result is the PTDB. Chapter 7 describes the creation and development of this database, and discusses the theoretical issues involved in (a) using corpora to determine which verb senses in English we should include in a generative grammar, (b) how to ensure that an appropriate proportion of these verbs are multi-word verbs, (c) the methodology for analysing very large numbers of verb senses (close to 5,400 so far) in terms of the Process type and their associated Participant Roles, and (d) how to deal with specific problem areas that arise in this body of data.

While the PTDB stands as a useful research tool in its own right, that can be used, as it stands, as an aid to text analysis, the original purpose of its creation was to be a resource for building the system networks presented here. Chapter 8 describes the method employed to create full system networks of Process types by recognising further semantic classifications within each. The chapter then presents a full description of the large and delicate system networks for (1) one-role, affected only, action Processes, (2) two-role, agent plus affected, action Processes and (3) three role, directional Processes.

Finally, chapter 9 provides a discussion and conclusion for the whole thesis. This chapter summarizes what the thesis demonstrates, what the products and applications of the thesis are, what the limitations of the thesis are, and it suggests some pointers for future work.

2: An Overview of Selected Approaches to TRANSITIVITY

2.1 Introduction

The purpose of this chapter is to provide a brief overview of some of the well established and interesting approaches to TRANSITIVITY of the last forty years. All the alternative theories considered here are concerned with the semantic classification of verbs and/or the associated semantic roles in a clause. The purpose of this Chapter is to provide some criteria for the decision to adopt Systemic Functional Grammar (SFG) as the most suitable theory for achieving the goals presented in Chapter 1.

One reason might be that, unlike the theories considered in Section 2.2, the SF approach is not interested in determining linguistic universals for the phenomenon, and is thus not constrained by exploratory margins that are 'based on a not necessarily linguistic intuition' (Starosta (1988:115-117), as quoted in Halliday and Matthiessen (1999:442)). Another reason for working in a SF framework is that the goal of my work is to provide an account that will fit into an existing computationally generative grammar of English that uses a SF framework. Moreover, while the theories considered in Section 2.3 provide an interesting and coherent description of the phenomena in language, they are ultimately descriptive rather than generative grammars. Finally, the studies presented in Section 2.4 and 2.5 also offer descriptive accounts of TRANSITIVITY. Unlike the big Grammars provided by Quirk et al and COBUILD, the studies presented in these sections are concerned with one area of language. They have, as we shall see, influenced the research presented in this thesis, despite being conducted in different frameworks (Chomskian, Lexical Semantics, Functional Grammar, etc.). This chapter, therefore, will provide a backdrop with which to compare the approach that this thesis takes.

Each of the scholars whose work is presented in this chapter considers possible classifications of verbs and the possible semantic classification of the 'arguments' that each verb can take. The works that I will be concerned with are described in such a way as to give an overview of key points of the key studies in the area rather than as an exhaustive historical description.

2.2 Fillmore (1968), Lyons (1968), and Chomsky (1981)

As a brief introduction to this section, we should note that Chomsky (1965), in *Aspects of the Theory of Syntax*, made his first proposals for a Generative Grammar with an independent lexicon, and he proposed that each lexical item in the lexicon should include three types of information: ‘categorical’, ‘subcategorial’ and ‘selectional’. Each of these provides syntactic information for each item in the lexicon. Lyons (1970:124) recognises that for Chomsky (1965) ‘the meaning of the sentence is derived … from its deep structure by means of the semantic rules of interpretation’.

Radford (1988) reports that both McCawley (1968) and Jackendoff (1972) argue that selectional restrictions involve the determination of the semantic and pragmatic properties of the predicate, and so hold no place in the lexical entry. However, Fillmore and later Chomsky (as we shall see in Sections 2.2.1 and 2.2.4) moved away from recognising these three types of information (categorical, subcategorial and selectional) in the lexical entry, and by the time of Chomsky’s proposals for the Government and Binding model, ‘Theta Theory’ defined what information was included in the lexical entry.

Consequently, we should keep in mind in considering Fillmore, that he was departing from Chomsky (1965), which considered case forms to be implemented at surface structure. That is, he recognised grammatical functions that involve inflexional additions at the point of surface structure, as with, for example, the rules for English pronouns.

2.2.1 Fillmore (1968)

Fillmore (1968) departs to some degree from what was then increasingly becoming a ‘mainstream’ approach to linguistics, i.e. Chomsky (1965). His discussion of what he proposes as ‘Case Grammar’ begins by recognising two types of relation: ‘pure’ and ‘labelled’. For Fillmore, ‘pure’ relations are the relations that hold, for example, between the ‘Subject’ and the constituent NP in the sentence, and the ‘direct object’ and the constituent NP in the sentence. ‘Labelled relations’, on the other hand, are the relations that holds between the NP and VP ‘which is mediated by a pseudocategory label such as Manner, Extent, Location, Agent’ (Fillmore 1968:16). It is this second category of ‘labelled relations’ which, for Fillmore, assign the ‘case forms', and which involve a determination of the semantic function. He draws the conclusion that 'all semantically relevant syntactic relations between NPs and the structures which contain them must be of the 'labelled' type' (1968:17).

Fillmore uses the term 'case' in the sense first introduced by Blake (1930) 'to identify the underlying syntactic-semantic relationship, and the term case form to mean the expression of the case relationship' (1968:21). We can recognise from his much quoted position on the phenomenon that even though he departs from Chomsky into the realms of the 'semantic', his fundamental principles are the same:

> 'The case notions comprise a set of universal, presumably innate, concepts which identify certain types of judgements human beings are capable of making about the events going on around them' (1968:24).

If we compare this quotation from Fillmore with the following quotation from Fawcett, (which illustrates a central notion in this thesis), we can see that the two frameworks are comparable in defining the area of language. However, these two paragraphs are also insightful in presenting the difference between Fillmore's framework and that of Systemic Functional Linguistics (SFL).

> 'The analysis of Participant Roles is one of the most insightful ways of understanding the view of the world that the person producing a text holds. The 'author' of a spoken or written text often reveals quite unconsciously his or her "world view"' (Fawcett, forthcoming a).

To explain further: while Fillmore is concerned with innate universals, and the nature of human beings, SF linguists are also interested in what happens in instances of text produced by individuals.

This section will now look in detail at the main criteria used in Fillmore's 'Case Grammar', to ascertain the extent to which his 'Case for Case' publication recognises the importance of considering the 'semantic' function of the grammatical functions of the sentence.

Fillmore proposes that the NPs associated with a verb are in a 'case' relationship with that verb, at the deep structure level. Interestingly, he recognises that 'the arrays of cases defining the sentence types of a language have the effect of imposing a classification on the verb in the language.' (1968:21), but he does not take the further step (as Halliday does, as others whose work is described in this chapter do, and as is attempted by this thesis) of suggesting what such classifications might be. Instead, the only semantic classification that he offers is the class of the case relation, which are comprised of the following set, and have the following labels:

Agentive (A)
Instrumental (I)
Dative (D)
Factitive (F)
Locative (L)
Objective (O)
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Benefactive (B)
Time (T)
Comitative (C)

Figure 2.1 Fillmore's Case Relations[6]

Along with his classification of possible case relations, Fillmore provides some semantic specifications and restrictions. For example, he states that the Agent in a sentence must be animate (or metaphorized as animate, e.g. a human institution noun such as a nation can occur as Agent). And the case relationships in a sentence constitute what Fillmore calls the 'proposition': 'a tenseless set of relationships involving verbs and nouns … the P (proposition) constituent is 'expanded' as a verb and one or more case categories' (1968:24). He also introduces an important parameter: that each case category can occur only once in a sentence.

Fillmore not only differs from Chomsky's (1965) grammatical functions by moving towards providing a description which includes a SEMANTIC aspect, he also differs by proposing that 'case assignment' actually occurs in the deep structure of the sentence, and not in the surface structure. By suggesting that each verb involves 'case

[6] I have introduced a division between the first six case relations and the last three because these last three are not included in his initial description of the 'set', but are introduced later within the description of 'Case Grammar'.

frame' information, he is paving the way for this type of information to be included in a word's lexical entry in a lexicon. Fillmore suggests that the configurations of case relations that can occur with a given word constitute that verb's 'case frames', and each verb in the language needs to be marked for which case frame type it can be present in. To illustrate, Fillmore presents the lexical entry for 'open', and the different possible case frames for this verb form are presented in Figure 2.2.

[_____ O]	- the door opened
[_____ O + A]	- John opened the door
[_____ O + I]	- the wind opened the door
[_____ O + I + A]	- John opened the door with a chisel
[_____ O (I) (A)]	- (John) opened the door (with a chisel)

Figure 2.2 Fillmore's case frame for 'open' (1968:27)

Figure 2.2 shows the possible case frames for 'open', and also the 'frame feature', (the last in the list) which serves as a summary for the lexical entry for 'open' by capturing all the possible case relations, and also capturing the optionality of cases with bracketing.

So we see that the 'case frames', and ultimately the 'frame feature' of each verb occurs in the deep structure. Fillmore explains what he means by deep structure by stating that:

> 'The deep structure of every simple sentence is an array consisting of a V plus a number of NPs holding special labelled relations to the sentence … Verbs are subclassified according to the case environments which accept them, and the semantic characterizations of verbs relate them to specific case elements in the environment or to elements containing features (such as animate-ness) introduced as obligatory accompaniments of particular cases.' (1968:31/32).

He then proposes the means by which this deep structure is to be converted into the surface structure of the sentence. The key 'mechanisms' that he recognises to allow the surface structure realization of the case forms are suppletion, affixation and addition of prepositions or postpositions. Fillmore recognises that the cases themselves can be defined by the occurrence of particular prepositions, and he proposes rules for English prepositions, as Figure 2.3 shows and which stands as a suggested classification rather than an absolute classification. Fillmore tells us that the prepositions that are allied with the various case forms are in fact realizations of the same underlying element, which he terms ‘Kasus’ or ‘K’.

Agentive:	*by*
Instrumental:	*by, with*
Objective:	zero
Factitive:	zero
Benefactive:	*for*
Dative:	*to*
Locative:	on, at, in, etc.

Figure 2.3 Fillmore’s proposal for the preposition types that each case typically takes

For the purposes of this thesis, Fillmore’s description of the relationship between surface structure and deep structure is not as interesting as his description of the case relations themselves. The SF framework does not make a distinction between ‘deep’ and ‘surface’ structure, but rather recognises the semanticity of roles associated with a verb[7]. In examining Fillmore’s proposals, however, we must work with his description of ‘deep structure’, because it is at this level that he attempts ‘semantic’ description.

In summary, the most interesting aspect of this early paper about Fillmore’s Case Grammar is his recognition of a need to describe the semantics. It seems that his Grammar paved the way for works that followed, such as Levin’s (1993) description of verb classes and ‘alternations’ (Section 2.4 of this Chapter) which are intended to be both syntactically and semantically motivated.

Perhaps most interesting of all is the concluding paragraph of Fillmore’s 1968 paper, where he looks to the future and states:

> ‘If it is possible to discover a semantically justified universal syntactic theory along the lines I have been suggesting, it is possible by rules … to make these ‘semantic

[7] In SFL, the equivalent of the verb at the level of semantics is the Process.

> deep structures' into surface forms of sentences, then it is likely that the syntactic deep structure of the type that has been made familiar from the work of Chomsky and his students is going to go the way of the phoneme. It is an artificial intermediate level between the empirically discoverable 'semantic deep structure' and the observationally accessible surface structure, a level the properties of which have more to do with the methodological commitments of grammarians than with the nature of human languages.' (1968:88).

These words can be interpreted as a prediction of the approach to be adopted here.

2.2.2 Lyons (1968) Introduction to Theoretical Linguistics

Lyons (1968) takes a more traditional view than Fillmore or Chomsky of syntactic structure, recognising subject and predicate as the nucleus of the sentence. He illustrates his approach with the verb 'kill' and the sentence in Example (1).

(1) John kills Bill.

In a similar vein to Fillmore's work, Lyons assigns cases to verbs and recognises that pronoun substitution in Example (1) allows one to see 'John' as displaying the nominative case, ('he'), and 'Bill' as having the accusative case, ('him'). Moreover, he recognises some kind of semantic functioning of the NPs in the clause.

Lyons recognises that the question 'What does X do?' can be asked of both transitive and intransitive sentences, with X being the nominal expression and 'do' being the 'pro-verb'. He states that 'whenever this condition holds … the subject may be described as 'actor' (or 'agent'). By contrast, the object-noun in transitive sentences is said to be the 'goal' (or 'patient')' (Lyons, 1968:341).

However, he does not overtly state that these terms 'actor' and 'goal' define the semantic roles in the sentence, and he also uses the term 'initiator of the action' for describing the subject in an active, transitive sentence. However, it is interesting that he includes these concepts in his description in that it reflects the influence already being felt by Halliday's 1967 proposals.

2.2.3 Chomsky's Theta Theory

Gruber (1965) introduced the notion that information about the semantic and pragmatic properties of the predicate should be included in the lexical entry, and in so doing he pioneered the way for what became Chomsky's 'Theta Theory'. But it was not until Chomsky developed his Government and Binding Theory (Chomsky 1981, 1982) that Gruber's proposals found a place in the theory, and this was long after the descriptions provided by Fillmore (1968), Anderson (1968), Lyons (1968), Halliday (1967/68), etc. This section will briefly describe 'theta theory' and the 'theta criterion', and I shall draw on the descriptions provided by Radford (1988) and Haegeman (1991)

Theta roles, or 'thematic relations', are ways of further describing the arguments associated with the predicate in a sentence. Theta role information is just another description that can be added to the entry for each lexical item in the lexicon. It is part of what Chomsky calls the 'subcategorisation' for each item, and involves all the further categorization of an item once it has been defined as N, V, etc. Theta theory provides a means for determining all the subcategorisation information (categorisation, and selectional restrictions), thus rendering subcategorisation in the lexicon redundant. It also details the range of complements an item takes.

The entry in the lexicon also contains information about the 'selectional restrictions' of an item. These are restrictions on the class of category that can occur. So if we consider the verb 'convince', as in Examples (1a) and (1b), we can see that this verb subcategorises a NP Complement, to ensure that it selects a rational Complement (i.e. what we might describe as a 'mind-possessing' entity) – so making (1b) ungrammatical.

(1a) You convinced my mother.
(1b) You convinced my birth.

However, another type of information is also involved, which states that each argument of a predicate has a thematic role (or 'theta role', or 'Ø role'), and 'the set of thematic functions which arguments can fulfil are drawn from a highly restricted, finite, universal set' (Radford, 1988:373). We can see that this claim is very similar to the claim made by Fillmore, as described in Section 2.2.1. Radford also states that the set of thematic functions varies from author to author, but he gives us some idea of a potential set, which clearly reflects the influence of Fillmore as well as Gruber.

Theme (or Patient)
Agent (or Actor)
Experiencer
Benefactive
Instrument
Locative
Goal
Source

Radford states that 'a variety of linguistic phenomena can be accounted for in a much more principled way in terms of "thematic functions" than in terms of constituent structure relations' (1988:373). Thus, Theta Theory is a means for distinguishing between the same verb form occurring in both a transitive and an ergative construction – as demonstrated in Examples (2a) and (2b), where 'the ball' plays the same thematic role in each but has a different syntactic status.

(2a) The ball rolled down the hill.
(2b) Mary rolled the ball down the hill.

So, determining the thematic function of the NPs allows us to explain occurrences that cannot be explained in grammatical terms. That is, the predicate can be determined by the semantic properties of what theta role it will be associated with, for example, 'down the hill'= 'locative'.

To summarize, Chomsky (1986:86) considers that thematic structure makes the selectional information redundant and that subcategorisation properties are unnecessary, writing; 'if c-selection (subcategorisation information) is redundant, in general, then the lexicon can be restricted to s-selection (thematic information)'. For example, an 'Experiencer' must necessarily be rational, so that selectional information about the syntactic features of the NP is redundant. Radford states that 'under this view, the only contextual information contained in lexical entries will be a theta grid specifying what theta role a given Predicate assigns to its Internal Arguments and what theta role (if any) it assigns compositionally to its Subject. This … is surely the kind of ambitious goal which any serious Theory of Language should set itself' (1988:389). This is primarily the goal to which the present research is intended to make a contribution – though in a different theoretical framework.

2.3 Quirk et al, COBUILD and Longman

We turn next to the contribution from the corpus-based grammars.

2.3.1 Quirk et al's The Comprehensive Grammar of the English Language (1985).

Quirk et al's (1985) grammar is based on 'The Survey of English Usage', which was the first corpus based study of grammar. They provide a description of what they class as 'Semantic roles of clause elements', and they, like Halliday and Fawcett (as we shall see later in this thesis), term these 'Participant Roles' (PRs). They state that 'by participants we understand entities realized by noun phrases, whether such entities are concrete or abstract' (1985:740). They also state that 'analysis of participant roles has not achieved a general consensus, nor has it fully explored all distinctions. Our description must therefore be considered tentative' (1985:741). In recognising this lack of general consensus, they recognise what this chapter seeks to demonstrate: that there are many approaches to this area of meaning, and that evaluation is by no means straightforward.

Quirk et al's description focuses on what roles the elements 'subject' and 'object' in the clause can take. The most typical role of the subject of a transitive clause is 'agentive'. This role involves the semantic specification that the entity is to be an animate being that instigates or causes the happening that the verb denotes, and an example is given in (1). The subject can also be an 'external causer' (for which they provide an alternative label: 'force'), which is typically used to describe a non-animate entity, as in Example (2). The role of the subject in a transitive clause can also be another non-animate entity: that of 'instrument', as in Example (3). And the subject in an intransitive sentence can have the role 'affected', as in Example (4), but this role will be described further in association with the direct object.

(1) Jack hit the door.

(2) The avalanche destroyed several houses.

(3) A stone broke his glasses.

(4) Jack fell down.

Reflecting a proposal in one of Fillmore's later papers, Quirk et al also suggest that the subject of a sentence can have a 'locative' or 'temporal' role, as in examples (5) and (6).

(5) Los Angeles is foggy.

(6) Yesterday was a holiday.

And the subject may also have what they term an 'eventive' role, where the noun is deverbal, as in Example (7). In Hallidayan terms this is an example of Grammatical Metaphor, with the Process of 'invading' being nominalized.

(7) The Norman invasion took place in 1066.

Section 5.9 of Chapter 5 will present Fawcett's class of 'event relating' Processes, and those and other sections of his TRANSITIVITY network include 'events' as PRs. As we shall see, this 'event relating' class also serves to capture some type of Process that Halliday would analyze in terms of grammatical metaphor.

In Quirk et al's description of direct objects, the most typical role of the direct object in a transitive clause is the 'affected' (also the 'patient' and the 'objective'), as in Example (8). They state that this role does not cause the happening in the clause, but instead is directly involved, typically as a result of the 'agentive' causing the happening.

(8) Many MPs criticized the Prime Minister.

Other roles which they recognise that the direct object can function as are 'locative', as with the verbs *walk, swim, pass, jump*, etc, as in Example (9), and 'resultant' (or 'object of result'), whose referent exists only because of the activity indicated by the verb, as in Example (10), where the cake is created by the process of baking. Quirk et al point out that this example should be contrasted with (10a), which demonstrates a different sense of 'bake', with 'some potatoes' being affected rather than created.

(9) We walked the streets.

(10) I baked a cake.

(10a) I baked some potatoes.

They also suggest that the direct object can have a 'cognate' role, which, as Example (11) shows, refers to the event indicated by the verb, where the object is morphologically related to the verb. And finally, they state that the direct object can have an 'eventive' role, which, in the same way as the 'eventive' subject role, takes the form of a deverbal noun, and bears the major part of the meaning, as in Example (12). We shall see in Section 7.5.1 of Chapter 7 that in the Cardiff Grammar (CG), this construction is considered to be a 'reified process'[8].

(11) She sang a song.

(12) They are having an argument.

Quirk et al also provide some semantic criteria for deciding whether a Participant Role (PR) is agent or affected by stating that 'the boundary between agentive and affective subjects depends on whether an element of causation or volition is present' (1985:744). And also, on less semantic grounds, they note the same restriction that we see in Fillmore's work: that two different role types cannot coordinate within a single clause, i.e. they illustrate by stating that we would not find the example 'the gamekeeper and a gun wounded him',

The Quirk et al grammar is a descriptive grammar – and so while they describe these PRs they do not go on to provide (a) any theoretical justification for WHY it might be this way, and (b) any notion of how the description might be used to produce a generative grammar. Therefore, while it is useful to recognise that this large grammar includes an eclectic account of semantic roles of clause elements, we

[8] This means that the process is realized as a 'thing', which is not the direct object, but instead is the 'MEx' ('Main Verb Extention').

do not need to interpret the Quirk et al (1985) description of PRs as a major theoretical claim – especially as they claim to provide no more than a tentative description. Perhaps all that needs to be stated in conclusion to this short section on Quirk et al (1985) is that all of the roles they recognise are accounted for in the CG, these being described in Chapter 5.

2.3.2 Hunston and Francis (2000) *Pattern Grammar*

As we shall see in Chapter 7, two of the key sources of data for this thesis were the *Collins COBUILD English Dictionary* (1995), and Francis, Hunston and Manning's *Collins COBUILD Grammar Patterns 1: Verbs* (1996). Both are based on the Bank of English corpus, which is a very large corpus, consisting of 327 million words (Hunston and Francis, 2000:282). Later chapters of this thesis will describe in some detail the nature and coverage of these publications. In this section we will consider the research behind these publications that provides the theoretical framework for the COBUILD Grammar. This is to be found in Hunston and Francis' (2000) *Pattern Grammar*, where Hunston and Francis state that historically, the origin of this approach is Hornby's (1954) *A Guide to Patterns and Usage in English*.

As the 'patterns' found in a language are integral to Hunston and Francis's approach, the best starting point for this section is to determine what Hunston and Francis mean by this term. They state that a pattern is 'a phraseology frequently associated with (a sense of) a word.' (2000:3, their bracketing). In practice, their patterns consist of linear representations of ITEMS or CLASSES OF ITEM or CLASSES OF UNITS. They deliberately avoid terms with structural implications (such as 'subject'), so that the description of a given pattern avoids a commitment to one type of constituency over another, or, indeed, of any constituency at all (2000:271/2).

In Francis et al (1996), the aim is to illustrate all the patterns found in the Bank of English, and to show all the lexical items that have this pattern, and then to group these lexical items according to meaning. In other words, they are attempting to make links between patterns and meaning, which is something that most of the works considered in this chapter seek to achieve.

However, Hunston and Francis stress that they are not making a strong claim about the link between form and meaning. In their concluding chapter they suggest that the association between pattern and meaning is not predictive. While you can derive meaning groups from the patterns they recognise, these groups do not include all the verbs of one meaning type. Further, while they make the claim that 'given a list of words occurring with a particular pattern, the majority will be divisible by most observers into reasonably coherent meaning groups' (2000:86), this is intended to be merely an observation and NOT a theoretical claim. In other words, they do NOT claim that 'a word has a particular pattern because it has a particular meaning' (2000:86). This contrasts, as we shall see, with the position taken by Levin (1993).

What their research shows, however, is that by working from the pattern type, i.e. a group of similarly behaving words, it is possible to derive subclassified meaning groups. Interestingly, these have many parallels with the product of the research to be presented in this thesis, i.e. the semantically based system networks that I have developed that are presented in Chapter 8.

Hunston and Francis argue that their observations about patterns associated with verb senses 'blur the distinctions between lexis and grammar (following Sinclair)' (2000:250 their bracketing). The blurring of this distinction is also at the heart of the SF approach to language, where grammatical and lexical items are located on a continuum – especially as implemented in the version that we shall distinguish in Chapter 5 as the Cardiff Grammar. However, Hunston and Francis distinguish their approach from that of SFG, stating that they are not concerned with a lexicogrammatical continuum, where lexis and grammar are 'essentially the same phenomenon' (2000:251), and where the continuum is realized through the system network.

Hunston and Francis suggest that there are difficulties with the SFG framework for modelling lexis. Firstly, they state that a system network involves directionality, and this, in their view, downgrades lexis 'to the end-point of grammar' (2000:251). They state that if you take lexis as the starting point (i.e. as they do) you arrive at 'a very different kind of grammar'. This is a fair judgement of the Sydney version of SFG, but I should point out that in the CG the features in the networks from which lexical items are generated – prototypically lexical verbs, nouns and adjectives – often lead on to further systems that are realized in further structures. It seems possible that the CG, which keeps syntax and lexis in balance, already incorporates some of the characteristics that Hunston and Francis consider necessary in an adequate theory of language. Secondly, Hunston and Francis suggest that in the SFG framework there is no place for the 'unit of meaning', or 'the co-selection of a whole phraseology' (2000:251). While this may be true of Halliday's model, it is not true of the CG, as Tucker's 'So Grammarians Haven't the Faintest Idea' (1996) demonstrates.

Francis et al's (1996) approach includes a 'meaning finder', which is an index that lists what Hunston and Francis (2000:109) term 'notional groups'. These 'notional groups' are derived from the verbs that take the same pattern type. For example, the 'eating, drinking and smoking' notional group can occur with the pattern **V *into* n**, as in example (1). So while they are hesitant to make any strong theoretical claims about the relation between form and meaning, their data provides evidence that the patterns they recognise can be related groups of verbs that share the same meaning.

(1) I bit into the apple.

Hunston and Francis recognise that meanings can be mapped onto patterns, and that Halliday's terminology of 'process', 'participant' and 'circumstance' allows us to implement such a mapping. They note that 'the participant roles proposed by Halliday (1994), represent the most effective way of dealing with this kind of variation in mapping. … the role realised by a noun group (in a clause) depends entirely on the choice of verb' (2000:127). Furthermore, they point out that two verbs with different patterns may take the same roles, and also that two verbs with the same pattern may demand different roles (2000:125) – and in this respect there appears to be common ground with the position taken in this thesis.

A criticism they make of Halliday's approach to this area is that, in the case of metaphorical processes, he provides a dual analysis – one congruent analysis and one metaphorical analysis. The present thesis also recognises this as a problem, and a description of the treatment of metaphor in this thesis is provided in Section 7.6.3.1 of Chapter 7. These present an alternative approach to dealing with metaphor that does not generalise between 'congruent' and the 'metaphorical' usage, preferring instead to model what we might call 'intended' meaning. It greatly reduces the number of cases of metaphor, but it does not directly – and should not – eliminate metaphor entirely.

Hunston and Francis state that in their work they 'associate roles not with process types but with notional groups, or meanings' (2000:129), but the position that I shall take in this thesis is that a 'process-type' is defined in terms of its associated configuration of PRs. The question is: Do the Process types, as so defined, coincide with the groupings by 'verb sense' (a concept that seems to be close to Hunston and Francis 'notional group'). As we shall see in Chapter 8, there is not a simple answer to this question.

In describing language as patterns of co-occurring items, Hunston and Francis incorporate Sinclair's 'idiom principle', which allows for the recognition of frequent collocations as key in the description. The concept behind a theory that is based on language use and thus centralizes frequently occurring patterns is of particular interest to this thesis. And, as we shall see in Chapter 7, the results of their work have proved to be invaluable for my research. However, the CG also has the means for dealing with frequently occurring 'units of meaning', such as analysis of Main Verb plus Main Verb Extension, and 'reified Processes', as we shall see in Chapter 7. Moreover, the CG has the means for generating how such 'units of meaning' are fitted together. In addition, the concept of 're-entry' in the system network approach means that we can specify predetermined and partly predetermined choices on re-entry to the network, and so the units of meaning can be realized in the lower units in a complex structure, and so fit together with the other units of meaning to realize pattern types such as those of Hunston and Francis that involve more than one layer of structure (see Fawcett, Tucker and Lin, (1993) and Tucker (1996) and the explanation of how the Cardiff version of SFG works).

2.3.3. Biber et al's (1999) The Longman Grammar of Spoken and Written English

Biber et al's *Longman Grammar of Spoken and Written English (LGSWE)* is also a grammar based on the analysis of a large corpus. Using essentially the same categories as Quirk et al (1985), they provide a detailed description, with many statements of frequencies and their variations according to certain major registers.

Reflecting a similar approach to that of Hunston and Francis (2000), Biber et al state that 'syntax and lexicon are often treated as independent components in English. Analysis of real texts shows, however, that most frequent syntactic structures tend to have an associated set of words or phrases that are frequently used with them'. (1999:13).

Their treatment of verbs considers the ‘major verb functions and classes’. Their approach is different from the COBUILD approach, in that they recognise ‘semantic domains’ which involve hierarchies. The COBUILD researchers do not do this explicitly, but, as we have seen, they look at meaning groups, as recognised from the patterns, and these groups do not have sub-types. Biber et al recognise seven major semantic domains: ‘activity verbs, communication verbs, mental verbs, causative verbs, verbs of simple occurrence, verbs of existence or relationship and aspectual verbs’ (1999:360), all of which can be subclassified. They recognise that each of these classes has a ‘core’ meaning, which relates to the notion of prototypes. But they also recognise that many verbs have multiple meanings that must be accounted for, and that may be from different semantic domains.

Like COBUILD, they recognise the patterns that verbs can occur in. They use traditional terminology to describe these patterns (intransitive, monotransitive, ditranstive and complex transitive). They suggest which semantic domains occur with which patterns, and they describe this across registerial domains. However, they make no attempt to describe the semantic features of the patterns themselves, and nor does the description attempt to provide an account of semantic roles associated with each verb type.

Their description provides useful corpus based statistics of the occurrences of verbs in real language, and this is the main value of Biber et al to this thesis. In particular, they detail the occurrence of multi word verbs in real language, and, as we shall see in Chapter 7, this was of real value in developing the Process Type Database.

2.4 Levin (1993) English Verb Classes and Alternations

Levin’s important work provides a classificatory analysis of a large number of English verbs (3262 in total), and, as such, it has been of interest to the present work from its inception. Indeed, the first hypothesis in the research to be reported here was that it might be possible to use her categories as a guide to extending the system networks of Process types. Here I shall both provide a description of this work, and a critique of the various aspects of it that make it a less helpful work than it might be.

Essentially, Levin seeks to provide syntactic and semantic categories that she recognises, respectively, as ‘alternation’ types and ‘class’ types. The concept of 'class types' fits with the 'Process types' and 'Participant Role (PR) configurations' that this thesis is concerned with.

Levin's hypothesis is that a verb's alternations and its internal structures are determined by its meaning. She states that her work:

> 'is guided by the assumption that the behaviour of a verb, particularly with respect to the expression and interpretation of its arguments, is to a large extent determined by its meaning' (1993:1)

She proposes a framework closely allied to the Chomskian approach to language in that she is concerned with the speaker's knowledge of the behaviour of each verb in the language, and how the speaker stores this knowledge as a lexical entry in the lexicon. However, she moves away from the early Chomskian notion of the lexicon in which each item has a 'subcategorisation frame'. She states that what the speaker knows goes beyond 'subcategorisation frame' information, because 'what enables a speaker to determine the behaviour of a verb is its meaning' (1993:4). For Levin, semantic information holds an important – and defining – place in the lexicon. The backdrop for her work involves some of the ideas generated by the Lexicon Project (1983-1987) at MIT, the purpose of which was 'to create dictionaries that make explicit the lexical competence of a native speaker' (Levin, 1985:1).

Levin goes further than Chomsky's 'Theta Theory' does by proposing that the semantic information in the lexicon determines the behaviour of the verb. Her research is concerned with how far the verbs in a semantically related 'verb class' are also syntactically related because of the ALTERNATIONS each verb in the class may participate in. She defines an 'alternation' as the 'alternations in the expression of arguments, sometimes accompanied by changes in meaning' (1993:3). An example that illustrates this notion is what she calls the 'causative/inchoative' alternation (1993:27). Verbs that participate in such an alternation can occur in both 'ergative' and 'intransitive' clauses, and an example of such a verb is 'break', as Examples (1a) and (1b) show.

(1a) Janet broke the cup.

(1b) The cup broke. (Levin, 1993: 29)

Levin recognises a set of alternations that, she implies, can account for all the meanings she is concerned with. I should emphasize that, while she implies that the set of alternations is finite, she points out that her offering does not attempt to be an exhaustive account of such a finite set. She suggests that any new verbs that come into the language will behave in the pattern of the established alternation types, and she proposes that the alternation type that a new verb will behave in is predicted by meaning type. If we look at the example of the verb ‘fax’ we note that this verb has come into usage fairly recently, and, interestingly, that it behaves in the same way as the other verbs of the type ‘instrument of communication’ (e.g. ‘cable’, ‘wire’, ‘radio’, etc). So, ‘fax’ comes into the language, and the speakers of the language ‘instinctively’ know that this new verb fits into a class which Levin terms ‘Verbs of Instrument of Communication’, and, as such, the verb ‘fax’ will participate in the ‘dative alternation’, as illustrated in Examples (2a) and (2b).

(2a) Heather faxed the news to Sara.

(2b) Heather faxed Sara the news.

Levin asserts that a new verb fits into the semantically related class, and it fits into the alternation type that this class takes. This serves as support for her hypothesis that there is link between meaning and syntactic behaviour.

The aspect of Levin’s work that is most interesting to this thesis is the categorisation of verb classes. I studied her classes carefully and was sometimes able to adopt her ideas for my classification, as we shall see in Chapter 8. However, despite my original hope that Levin’s work would play a large part in this thesis, the experience of looking closely at the large number of verb senses that I have included in the Process Type Database (as described in Chapter 7), I found several incompatibilities that made it difficult to incorporate as much as I had expected of her work in the research presented here.

In this section I will concentrate on an evaluation of Levin’s proposals, and then in Section 7.6.1.2 in Chapter 7 I will provide an account of how I attempted to use her description of verb classes as a resource for classification.

The first aspect of Levin’s work that is incompatible with a central point of this thesis is that her classification does not include any multi-word verbs. As we shall see, the multi-word verbs occur in English with a very high frequency, and they are used to convey a large number of meanings in the language. However, Levin does not deal with more than a very few cases.

However, she does account for the possibility of an alternation that introduces a ‘preposition’ into the clause. An example of this is her ‘Preposition Drop Alternation’. She describes this transitivity alternation as ‘involving a verb found either in an intransitive frame with a prepositional phrase complement or else in a transitive frame.’ (1993:43)[9]. This is manifested in the difference between a ‘single word verb sense’ and an associated ‘prepositional verb sense’, as Examples 3a and 3b show.

(3a) Martha climbed the mountain.

(3b) Martha climbed up the mountain.

While it appears that an alternation such as this accounts for the introduction of a preposition into the clause, and so for the possible recognition of a verb class that take a prepositional phrase as its Complement. However, this is not a standard prepositional verb, such as *look at* or *dispose of* are. It is interesting that the ‘peer verbs’ class, which includes the most frequently occurring prepositional verb (Biber et al, 1999) *look at*, does not enter into any alternation, but is a semantically coherent group that take a prepositional phrase complement.

Furthermore, Levin does not include any ‘phrasal verbs’ in her classification. Yet it is the frequently used phrasal verbs in the language that often have individual meanings, unrelated to the single word verb form that they include. For example, she does not include the phrasal verb ‘get up’, which is semantically unrelated to the single verb ‘get’. The nearest verb classes for this phrasal verb to occur in are ‘verbs of assuming a position’ (bend, bow, crouch, flop, hang, kneel, lean, lie …) and ‘verbs of inherently directed motion’ (advance, arrive, ascend, come, depart …). In fact, ‘get up’ does not fit into these classes because it does not participate in the relevant alternations. It would therefore be interesting to add to Levin’s work by determining the place for the many frequently used multi-word verbs.

[9] The approach taken in the present thesis would not recognise (3b) as an intransitive verb.

In her treatment of prepositional verbs, she seems to generalise a difference in meaning within a single alternation type. For example, the 'conative alternation' allows a verb to occur either on its own or as a prepositional verb, taking the preposition *at*. Thus she recognises the verb *cut* to participate in the conative alternation and thus to occur also as *cut at*. However, I suggest that the 'conative' meaning in the prepositional verb *cut at* is a very different meaning from *cut*. Thus, her generalisation seems to me to be uninsightful, because what we should recognise here are two verb senses, which should be entered into two verb classes.

A second proposal that makes her research of less value than I had hoped to the research presented in this thesis is as follows. While she recognises a single verb form as behaving in different ways according to the alternations it can occur in, she does not explicitly state that a verb FORM behaves differently depending on its SENSE. For example, she places the verb form *open* in four different verb classes, as follows[10]:

1. 'Verbs of signs involved bodies' parts: crane verbs.' This class of verbs specifically includes the sense of *open* as in *open your eyes*.
2. 'Alternating verbs of change of state'. It is not clear how *open* fits in with this verb class. It is for verbs that include some externally caused change of state, and that have the ability to participate in the 'causative/inchoative' alternation. This large class of verbs are syntactically related by the alternation they participate in but are also a semantically diverse group. We must presume that the sense of 'open' that she intends here is the 'prototypical' sense as in 'open the door'.
3. 'Appear verbs'. The verbs included in this class do not occur in a causative construction, so we must infer that this is a different sense of 'open' to the senses in classes 1 and 2. Levin comments on this verb class by stating that 'some of the verbs listed, such as 'open' and 'break', are basically verbs of change of state and are used as verbs of appearance in an extended, possibly figurative sense …it seems that those verbs (in this class) that do show transitive causative uses show them on a sense other than their appearance sense.' (1993:259). Such passages are not particularly helpful, but we may guess that Levin is referring to a sense of *open* as in *the ground opened*. Rather than explaining that some of the verbs in a

[10] My own detailed study of 'open' as it occurs in the COBUILD corpus is presented in Section 7.6.3.2 of Chapter 7.

given class can be transitive while some cannot, it would perhaps have been more insightful to provide a gloss of the sense type, which could then be referred to as a separate sense[11]. Just as the verbs 'kill' and 'die' refer to related activities and are nonetheless recognised by Levin as separate senses (and so occur in separate classes), we should also treat different senses of the forms such as *open* separately[12].

4. 'Verbs of spatial configuration'. It is simply not clear which sense of 'open' Levin includes in this class. The example she provides for this class is 'a statue stood on the corner', and so we can recognise it to be an intransitive clause, which lacks an agentive argument[13].

Rather than recognising the different senses a form might have, Levin explains that the verb form has 'extended meaning'. She claims that 'when a verb has more than one meaning, one of its meanings is basic, and the others are systematically related to it, that is, they are instances of extended meaning' (1993:22). Here I shall take a different position, namely that most of Levin's 'extended meanings' are separate 'senses' and the term 'extended meanings' is more appropriately used to refer to metaphor.

This discussion of alternative viewpoints on this matter highlights how problematical it is to determine which verb sense she is referring to, at any given point – especially since she does not provide examples for each verb listed in each class. She merely points out that there are exceptions, without fully illustrating their implications. For example, for *open* in the class described in 3 above she states that verbs in this class cannot occur in a transitive construction EXCEPT FOR *break* and *open*. Kohl et al (1998) justifiably state that 'since [Levin] gives only one example sentence per verb class, significant effort was required to reach our goal of producing natural sounding example sentences for all verbs.' They cite, as an example, the class of verbs 'Motion around an Axis', for which Levin provides an example sentence of

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[11] The hypothesis of treating all verb senses as individual and unrelated items will be discussed further in this thesis, particularly in Section 5.4.1 in Chapter 5, where an argument for not generalising between 'transitive' and 'intransitive' constructions is presented.

[12] Levin includes 'kill' in the 'murder verbs' class, and 'die' in the 'verbs of disappearance' class.

[13] As we shall see in Chapter 5, in the Cardiff Grammar treats this example as an 'action' Process, with 'one-role', and that role is a 'carrier'.

'Janet turned the cup' and the alternation 'the cup turned'. Kohl et al point out that 'when other verbs in the class are mechanically substituted for *turning* the example sentences, some of them sound odd: for example, 'Janet wound the cup'.

Furthermore, Levin does not cover all the senses that a verb form can have, but seems only to cover the most central sense – i.e. what we might refer to as the 'prototype'[14]. Thus, she recognises the verb 'make' as occurring in the verb classes 'build verbs', for which the semantic specification is that something is created, and 'dub verbs', for which the semantic specification is that the verb 'relates to the bestowing of names' (1993:182). But from my trawling through occurrences of different senses of the verb form I was able to recognise a further sense that is not included in any of her verb class. This is the sense of 'make' as a synonym of the verbs 'amounts to' and 'equals'. In fact, she does not include this area of meaning at all, which leads us to a further consideration.[15]

Since the semantic coverage of each of the verb forms included in Levin (1993) is not overtly defined, it is not possible to even begin to discover how she arrived at the areas of meaning that she recognises (in contrast with the clear account of the methodology used by Hunston and Francis (2000)). We know that her main goal is to show the impressive extent to which meanings and the syntactic patterns that a verb can occur in (or rather, the alternations a verb can occur in), match up, and that concurrently her aim is to ascertain how the semantic relations she recognises correlate with semantic classes. But in attempting to achieve this goal there seem to be many semantic fields, or 'areas of experience' that are missing (such as the area of meaning which is realised by the verbs 'makes', 'equals' and 'amounts to'), and from the viewpoint of this thesis it is regrettable that there are such holes in the coverage of the semantic domains.

A further failing in this study is that her coverage does not include some of the most frequently used verbs. Indeed, their inclusion would itself be a useful key to a full coverage of many semantic domains. As we shall see in Section 7.6.1.2 of

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[14] I return to the notion of 'prototypes' in verb categories in Section 7.6.1 of Chapter 7.

[15] Hunston and Francis (2000) recognise a similar argument in relation to their own description of the 'patterns' a verb can occur in. They argue that 'the semantic set that *die* belongs to changes according to the pattern with which the verb is used. *Die*, in fact, belongs to several sets: one with the meaning 'disappear', one where it is connected with *live*, one with the meaning 'finish' and one with the meaning 'suffer'.' (2000:146). A more detailed description of Hunston and Francis (2000) was provided in Section 2.3.2 of this Chapter.

Chapter 7, Levin fails to deal with 10% of the verbs that COBUILD recognises to be in the top-most bracket of frequently occurring verbs (those with five diamonds in Francis et al (1996)).

Finally, and perhaps most importantly, Levin's verb classes do not always comprise a semantically coherent group, despite her assertion that 'any class of verbs whose members pattern together with respect to diathesis alternations should be a semantically coherent class: its members should share at least some aspect of meaning'. (1993:14).

It would seem that while a group of verbs that fit the same alternation types leads one to recognise some kind of relation, it is not necessarily the case that this relation is a semantic one. For example, her verb class of 'amalgamate verbs' are grouped purely on the grounds of the alternations they can enter into, as she states: 'the most salient property of the *amalgamate* verbs is that they undergo the simple reciprocal alternation, but they are set apart from the other verbs of combining and attaching in not being found in the *together* reciprocal alternation.' (1993:161). But when we look closely at this verb class, we can see that they do not belong semantically with the 'verbs of combining and attaching', and indeed, that they are not all semantically related to the verb 'amalgamate'. For example, she includes the verbs 'alternate', 'compare' and 'confuse' in this class, which seem to the reader at least to be semantically different. Another large verb class which consists of semantically diverse verbs is the 'alternating verbs of change of state' (1993:244), which was mentioned above as having *open* as a member. The verbs in this class have a relationship to each other in so much as they all involve a 'change of state', but, as we shall see in Chapter 8, my classification of this highly generalized category necessarily involves several stages of subcategorisation to reach some semantic cohesion.

I will conclude this summary of the work of Levin (1993) by quoting her honest statement that 'the scope of this book is likely to contain inconsistencies, omissions and inaccuracies, which reflect the practical difficulties that face attempts to accurately and exhaustively carry out hypothesis checking over a large number of English verbs' (1993:19). And, although I have tried to repair some of the inconsistencies in Levin's semantic classification, I would like to adopt her cautionary words as ones that can also be applied to the work presented in this thesis.

However, Levin also states that 'what is important is the existence of core sets of verbs with specific sets of properties **that can provide the basis for the later identification of meaning components'** (1993:19) (my emphasis). What my research aims to do is to provide a set of system networks for 'most delicate TRANSITIVITY' that has a place in a generative model of language. And since it is to be a semantic classification of verbs that can also handle 'sets of verbs with specific sets of [syntactic] properties' I am, I would like to think, carrying out some of the work of the 'later development of many concepts' that she anticipates. Moreover, my aim is that the results will be sufficiently explicit to be tested in a computer model of language generation.

2.5 Other Approaches

2.5.1 Hopper and Thompson (1979) Transitivity in Grammar and Discourse

Hopper and Thompson (1979) are working in a 'functional' linguistic paradigm, namely, American 'West-Coast' Functionalism. Their work is of interest to this thesis because the theory is concerned both with 'functions' and with social interaction and the way that language is actually used.

Their particular study proposes a number of transitivity variables which, when they are combined, define whether a clause displays what they term 'high-transitivity' or 'low-transitivity'. For example, a 'two participant' action is higher than a 'one participant' action. And within this, they interpret transitivity in terms of ten parameters, each with a scale from low to high transitivity values (for example, the degree of affectedness of the object would be a transitivity parameter.) Matthiessen (1999) considers their work to be, along with that of Halliday, particularly significant within functional Linguistics, and he states that 'unlike Halliday, they do not, however, model these parameters by means of an explicit form of representation such as the system network and thus they do not operate with more or less delicately specified parametric distinctions' (1999:3).

Hopper and Thompson's proposals incorporate a 'Transitivity Hypothesis' (1979:225). This is a universal claim that the 'transitivity parameters' co-vary across languages: 'If two clauses (a) and (b) in a language differ in that (a) is higher in transitivity according to the features A-J, then, if a concomitant grammatical or semantic difference appears elsewhere in the clause, that difference will also show (a) to be higher in Transitivity'. And they make the point – familiar from studies summarized earlier – that these parameters are 'structural-semantic' features.

They argue that high transitivity and low transitivity correlate respectively with 'foregrounding' and 'backgrounding' in discourse. In line with this, 'two participant' clauses most frequently serve a foregrounding function, while 'one participant' clauses serve a backgrounding function. This assertion, they state, is borne out by the fact that 'two participant' clauses typically involve actions and 'one participant' clauses typically involve states. And in the case where a backgrounding function has 'two participants', the Agent will often be covert.

Hopper and Thompson claim that this is a correlation between grammar and discourse, and they conclude that one necessarily influences the other. This is, of course, a functionally based approach, and while their categorization is along different lines from that in a SFG, both adopt a functional standpoint.

They conclude: "while we claim that the discourse distinction between foregrounding and backgrounding provides the key to understanding the grammatical and semantic facts we have been discussing, we also explicitly recognize that grounding itself reflects a deeper set of principles – relating to decisions which speakers make, on the basis of their assessment of their hearer's situation, about how to present what they have to say.' (1980:295).

While there are no concepts in their work that I need to incorporate in the present research, it is interesting to find an approach to transitivity that is from a DISCOURSE perspective and to think about the possible future applications.

2.5.2 Fellbaum (1998) 'A Semantic Network of English Verbs'

Fellbaum provides an account of how the verbal lexicon is classified for entry into the WordNet project. This project was developed on the basis of three main hypotheses. The first is the 'separability hypothesis', which presupposes that the lexicon can be isolated from 'language' as a whole system, and thus can be studied and described in its own right. The second hypothesis is the 'patterning hypothesis', which presupposes that a speaker makes use of a 'readily available' lexical knowledge, which is based on 'systematic patterns and relations among the meanings that words can be used to express' (1998:xv). And the third hypothesis is the 'comprehensiveness hypothesis' that presupposes that a computational system of language needs to have 'a store of knowledge as extensive as people have' (1998:xvi).

As we shall see, WordNet has similarities to the work presented here in that it aims to provide a taxonomy of semantically related 'synsets' (a term that I shall define shortly). However, it is interesting to note that only one of these presuppositions matches the requirements of the framework for the present research, and this is the 'comprehensiveness hypothesis'. This notion of 'comprehensiveness' is useful because the data presented in the later chapters of this thesis works from a premise that requires a wide coverage of items in a computational model of language.

Fellbaum states that the WordNet classification differs from other types of 'semantic field' analysis, because traditional semantic field analysis employs both paradigmatic and syntagmatic relations – much in the manner that Levin (1993) does. WordNet, however, only recognises syntagmatic relations as part of a description for an individual word and does not attempt to build these into the overall network. Therefore, the classification that they have produced recognises syntactic frames for each verb, but does not link these frames to the semantic, or 'thematic' roles, as we have seen with thematic roles in Section 2.2.4.

Fellbaum recognises therefore that their approach is significantly different from Levin's. Although Fellbaum recognises Levin's work as 'probably the most comprehensive exploration of parallel syntactic-semantic patterns in the English verb lexicon' (1998:95), WordNet differs having as its aim 'trying to uncover the semantic organization of the lexicon in terms of lexical and semantic relations' (1998:95).

We may suggest then, that the aims of the work presented in this thesis has more in common with the aims of Levin's work than the aims of WordNet, because the present work is concerned with parallels between the semantic senses of each verb and the structures that each can occur with, in terms of 'Participant Role configurations'. However, it is interesting to explore this database as a further check on the extent to which semantically based classifications lack insights that are captured in syntactically-semantically based classifications.

WordNet aims to cover all aspects of language in an electronic lexical database, but in this section we shall only consider their approach to verbs. The starting point for entering the verbal lexicon into a lexical database was to take a body of verb forms, and to begin by grouping verbs into semantic fields. The classification is therefore semantically based, and the first split was between what they termed 'actions', 'events', and 'states'.

Within these initial categories, actions and events are split into the following 'files': motion, perception, contact, communication, competition, change, cognition, consumption, creation, emotion, possession, bodily care and functions, and social behaviour and interactions. These 'files' are partly based on Miller and Johnson-Laird (1976).

States are split into the following: 'be', 'resemble', 'belong' and 'suffice', each of which they recognise to be a heterogeneous class that does not constitute a semantic domain, and also the auxiliary verbs, control verbs and aspectual verbs.

So, as with Fillmore and Levin, the goal for WordNet is to carve up the 'verb lexicon' into semantically related fields. This is, for the present research, roughly equivalent to dividing up the relevant parts of the experiential strand of meaning into Process types.

They then rebuilt these domains into groups of synonyms, which they call 'synsets'. These sets are constituted of verbs that can be substituted for each, i.e. that are claimed to be synonyms of each other, such as 'shut' and 'close'. They recognise that the synonyms in a synset can be of different registers in the language, and thus a speaker has some basis for knowing which verb is appropriate in which context. They mark such register differences with a bracketed comment to state this fact. They also recognise that there are selectional restrictions that will determine which verb is appropriate in a context (i.e. what can co-occur with each verb) and that this will also differentiate apparent synonyms. In the case where verbs are differentiated by their selectional restrictions, they choose to avoid putting such verbs in the same synset.

In this publication, Fellbaum suggests that future versions of WordNet may well incorporate syntactic information. They may attempt to map thematic roles onto each verb entry, and thus be useful for Natural Language Processing applications. The importance for this thesis is that this was not their starting point, as they used a pre-existing inventory of semantic classes, and then fitted the lexemes into these classes. The Process Type Database, to be presented in Chapter 7, has the advantage of being created from a 'bottom-up' perspective, i.e. working from the words upwards to the categorial information, which is thus suitable for interpreting in system network terms and thus for becoming part of an integrated, generative lexicogrammar.

2.5.3 Faber and Mairal Uson (1999) Constructing a Lexicon of English Verbs

Faber and Mairal Uson work in the framework of Dik's Functional Grammar (FG), and they seek to develop his proposals. These suggest the value of organizing predicates into coherent semantic classes, encoding both syntactic and semantic regularities. They have developed a framework that they call the 'Functional-Lexamatic Model' (FLM), and their intention is to expand the FG lexicon, particularly in the area of verbs in the belief that a verb's semantic components can reflect their syntactic properties. Thus, their starting point is similar to Levin's. However, they are working in a different framework from Levin, and they aim to map both paradigmatic and syntagmatic information onto each verb entry in the lexicon.

Faber and Mairal Uson aim to include information in their lexicon of how lexemes are related to other lexemes. They state that:

> 'microstructurally, this means examining the role meaning definitions play in the development of the interface between syntax and semantics. Macrostructurally, this signifies situating lexemes within the larger context of their lexical domain, and specifying their relations with lexemes in other areas of meaning. In this way, lexemes are not conceived as a frozen list of items, but rather as dynamic representations within a conceptual network.' (1999:3)

And the fact that they take this step of aiming to realize a dynamic representation with a conceptual network brings them closer than some other studies to the aims of the present research. They move away from a flat taxonomy towards the 'system network' model of SF, which they term a 'conceptual network'. It seems that their network is essentially like a system network, because their lexicon also incorporates a hierarchical structure, with classifications and further subclassifications. They classify by constructing 'lexical hierarchies', and a lexical hierarchy includes a 'genus', which they also refer to as the 'prototype. For example, in the lexical domain of possession, the genus is 'have', with all the other verbs in this domain structured around this genus. Moreover, they state that the relation between 'have' and the other related verbs 'is conceived as a structural relation in the global context of an entire lexical domain, and not merely pertaining to individual lexemes.' (1999:102). The 'genus' is like the 'x_as_such' type of feature that we shall meet in Chapter 8.

They also recognise that verbs in the lexicon should be accompanied by 'meaning components' or 'semantic features', such as Agent, Goal/Patient and Beneficiary, and this is in a similar vein to Chomsky's Theta Roles and Fillmore's 'cases', and Halliday and Fawcett's PR.

Their syntactic analysis of the verbs in the lexicon consists of observing the complementation patterns for each verb. They state that 'complementation is a matter of matching the semantics of the higher predicate, as specified in the lexical subdomain in question, with the semantics of the complement phrase.' (1999:114). This is similar to the framework for complementation used in the type of SFG that will be described in this thesis.

Finally, they suggest that semantic parameters constrain and filter the syntax of a verb. These parameters are (1) 'grammatical parameters', which are along the lines of Fillmore's case types, and which, they state, construct the underlying clause structure, (2) 'optional parameters', which are concerned with the realization of the argument structure, and the obligatoriness of this realization, and (3) 'contextual parameters', which are codified in types of pragmatic information.

They provide a large scale demonstration of the FLM approach, providing 'synsem' (syntactic-semantic) information for a large and impressive number of interrelated lexical domains and subdomains.

2.6 Conclusion

All of the approaches that have been considered in this Chapter have one key assumption in common, with the exception of the COBUILD model, as they are all concerned with describing a 'lexicon', while, at the same time, seeking to include syntactic/structural information about each item. Clearly, the way forward is through the concept of a 'lexicogrammar', which includes both the syntactic and the lexical semantic. And this is precisely the type of model that the rest of this thesis will be concerned with.

An overview of all the work conducted in this area could have included summaries of research on many further theories and, in particular, we could consider in more detail Gruber (1965), Fillmore's later work including his 'Frame Net', Anderson's work, and also that of Chafe, Cook, and Dik. But for the purposes of this thesis I have chosen to concentrate on another line of thinking that also began in the late sixties. The next chapter will therefore present a detailed examination of the SFL approach, starting with Halliday's 1961 paper, 'Categories of the Theory of Grammar'.

3: Approaches to TRANSITIVITY in SFG

3.1 The structure of this chapter

It was Halliday who first proposed that TRANSITIVITY should be regarded as a property of clauses rather than verbs, as we shall see in Section 3.1.5. In this thesis, and as explored in this chapter, the term ‘transitivity’ is used in Halliday’s sense, but also, since the approach taken here is in line with Fawcett (2000b) where lexical verbs are treated as direct elements of the clause and not as part of a ‘verbal group’, the traditional view of ‘transitivity’ as a property of the verb is also accommodated.

This chapter provides both a history of work in the area of TRANSITIVITY within the theory of Systemic Functional Linguistics (SFL), and a critical evaluation of that work. Whilst the previous chapter was concerned with approaches to TRANSITIVITY in the wider context of linguistics as a whole, in this chapter our concern will be with models of TRANSITIVITY within the framework of SFL. M.A.K Halliday (1925 -) is the originator of the theory, and his work will therefore be considered in particular detail, but the contributions of other scholars working in the tradition will also be considered. In particular, the work on TRANSITIVITY of the branch of the theory known as the ‘Cardiff Grammar’ (CG) will be contrasted with Halliday’s ideas. Since the present research is concerned with modelling TRANSITIVITY in the CG framework, this contrast must be examined and evaluated in order that the CG approach to TRANSITIVITY be located in its appropriate place in the wider theory. Thus in this chapter the early formulations of the CG approach to TRANSITIVITY will be considered.[16]

After briefly considering the roots of SFL, the starting point for this chapter will be Halliday’s seminal 1961 paper ‘Categories of the Theory of Grammar’. This paper functions as the initial statement of the theory that soon came to be called ‘Scale and Category Grammar’, but was later known as – and indeed is still known as - ‘Systemic Functional Linguistics’. The next section of the chapter will cover Halliday’s 1964 system networks (Halliday 1964/76:101 – 135) and his descriptions in ‘Notes on Transitivity and Theme Parts 1 and 3’ (Halliday 1965/7). It is through

[16] A detailed description of the present CG account of TRANSITIVITY will be presented in Chapter 5.

these important papers that Halliday's view on TRANSITIVITY is first presented and that the move away from traditional views of grammar towards a more semantic approach can be detected.

Having determined Halliday's early standpoint, the next section of the chapter will turn to other scholars who took these works and produced summaries of, or arguments to, Halliday's proposals, namely Muir (1972), Berry (1975) and Hudson (1971). The chapter will also examine further contributions by Halliday, in particular 1970 and 1977. Also included, as stated above, are important publications by Fawcett – 1973 and 1980 – as precursors to the branch of the theory known as the Cardiff Grammar. The first half of the chapter will conclude with a discussion of Halliday's most recent and explicit statement on TRANSITIVITY – his 1985 handbook, 'An Introduction to Functional Grammar'.

After IFG, which serves as the handbook to Halliday's theory, we find further work by scholars who are either taking on board the theory and adapting as they see fit for their specific uses, or using the theory as a tool and conducting research which extends the theory into further domains. The second half of this chapter, which is concerned with various other approaches to TRANSITIVITY in Systemic Functional Linguistics, will essentially be split into three main parts, each concerned with one major theme.

The first section of part two will consider a concept which is a major concern of a Systemic Functional grammar and concerns the area of TRANSITIVITY first introduced by Halliday in 1961; the notion of 'lexis as most delicate grammar'.

Tucker (1998) provides a description of approaches to lexis in a SFL framework, and, as might be expected, this description includes accounts of the 'lexis as most delicate grammar' view, which was described in Section 3.1.3. Tucker recognizes the works of Berry (1977), Fawcett (1980) and Hasan (1987) as being the most important explorations of the 'lexis as most delicate grammar' notion, and this chapter will examine these scholar's approaches to modelling a 'lexicogrammar'. Section 3.2.1 will consider Berry and Fawcett's proposals, and then Section 3.2.2 will look at Hasan's (1987) treatment of a small area of semantically related verbs. The 'delicacy' theme has been recurrent in the first half of this chapter, and it is of particular relevance to the present research, which is concerned with creating delicate system networks.

The next major section of this half of the chapter is concerned with another theme that has appeared through the first half of this chapter. This is the notion of 'ergativity' in TRANSITIVITY, and Section 3.2.4 will explore Davidse's work in this area. The notion of causation is central in classifying the functioning of Processes and Participants in the experiential metafunction, and Davidse's extensive work on the area provides us with some possible extensions of Halliday's work.

Finally, the last section of this chapter of TRANSITIVITY is concerned with a third recurrent theme – the progression of the description of TRANSITIVITY in SFG. This final section will be concerned with Matthiessen (1995) as a current description of TRANSITIVITY for the purposes of generation, and so including the presentation of the system networks for TRANSITIVITY that are missing in Halliday (1985/94).

It should be noted that the further developments in the framework of the Cardiff Grammar are described fully in Chapter 5.

3.1.1 The history of TRANSITIVITY in SFG up to Halliday's *Introduction to Functional Grammar*

3.1.2 Firthian Linguistics

The basis of SFL theory can be found in the work of J. R. Firth and his colleagues in the London School of Linguistics. Halliday was a student of Firth's, and adopted and developed aspects of his work. Firth's descriptions were different from the American 'descriptivists', and his approach to language is described by Butler (1985:3) as being one whereby 'meaning, viewed as the function of a linguistic item in its context of use, was paramount, and in which one very important type of context was the social context in which an utterance is produced'. Thus, in the differences between Firth and the American descriptivists, we can detect an early sign of what was later to grow into the two fundamentally different approaches to language of Systemic Functional Linguistics and Transformational Generative Grammar.

From the ideas of Firth and the London School, Halliday has developed a view of language as a 'meaning-making' system, with an emphasis on 'choice'. The shift is towards a description of grammar based on likelihoods of occurrence rather than dividing instances of language according to 'correctness'.

3.1.3 Halliday 1961

In ‘Categories of the Theory of Grammar’ Halliday proposes that general linguistic description should have four grammatical categories and three different scales by which these categories are linked – hence the use of ‘Scale and Category Grammar’ as the name of the theory at this stage. In Halliday’s words, ‘the relevant theory consists of a scheme of interrelated categories which are set up to account for the data, and a set of scales of abstraction which relate the categories to the data and to each other.’ (1961/76:52).

Halliday highlights the mutual interdependence of the categories – unit, structure, class and system – writing that ‘each of the four is specifically related to, and logically derivable from, each of the others’ (Halliday 1961/76:55). But they also function **within** the ‘three distinct scales of abstraction – those of “rank”, “exponence”, and “delicacy”.’ (1961/76:55).

Therefore, at this point the emphasis is not on ‘system’ as being at a different level from the categories of ‘unit’, ‘class’ and ‘structure’, as it is later. And because of this Halliday’s treatment of TRANSITIVITY in this 1961 paper bears little relation to the system network that he was to propose later, and the system networks that have resulted from the present research. However, ‘Categories’ contains some pointers to future developments within SFG. The notion of ‘system’, especially when taken in conjunction with the scale of ‘delicacy’, provides an important indication of the future direction of the theory. Moreover, one can see the precursor of Halliday’s later emphasis on the notion of ‘system’ as **choice** when he writes that ‘what remains to be accounted for is the occurrence of one rather than another from among a number of like events … (and) … the category set up for this purpose is the “system”’ (1961/76:67). Even though it is not made fully explicit, it seems that what is implied here is that one option is chosen over another option in a system, so foreshadowing the concept that was to come to dominate the theory.

The description of ‘system’ is made explicit in relation to ‘classes’, and ‘secondary classes’, with specific reference to the concept of ‘sub-classes’ as choices between ‘mutually exclusive possibilities … within a class.’ (1961/76:67). This implies the concept of a system network (even though the term is not yet mentioned), because it suggests that a choice between primary classes in a system can then lead into a choice between secondary classes, along a scale of ‘delicacy’.

The ultimate application of the concepts of 'system' and 'delicacy' is in the treatment of lexis. In 'Categories', Halliday suggests that 'the grammarian's dream is … of constant territorial expansion. He would like to turn the whole of linguistic form into grammar, hoping to show that lexis can be defined as "most delicate grammar". The exit to lexis would then be closed, and all exponents ranged in systems.' (1961/76:69). Through this the concept of **systems** that are traversed by making choices on a scale is actualized, and we shall see below just how Halliday works out these ideas with reference to TRANSITIVITY.[17]

In Halliday's assertion of 'the grammarian's dream' there is a clear challenge. This can be recognized when he says that 'no description has yet been made so delicate that we can test whether there really comes a place where increased delicacy yields no further systems.' (1961/76:69). In 'Categories', however, he is content to treat grammar and lexis as two separate parts of the theory. For example, he differentiates between the 'closed systems' of grammar and the 'open systems' of lexis. Although he is already indicating the desirability of merging the two – which constitutes an initial move towards **lexicogrammar** – he states that 'the theory has to treat these [grammar and lexis] as two distinct types of pattern requiring different categories' (1961/76:55), and he seems content that 'there must … be a theory of lexis, to account for that part of linguistic form which grammar cannot handle.' (19617/6:72). The aim is clear and the challenge has already been taken up at various later stages in the development of the theory by various scholars, and it is indeed the concept that my research will explore, introducing, as it does, a number of new ideas.

So far I have discussed the way in which 'Categories of the Theory of Grammar' anticipates the view of grammar as being essentially a system network of choices. But there is no indication of what the system network for TRANSITIVITY would be like in Halliday 1961. However, there are some indications of what TRANSITIVITY might be like in the section of the paper describing the category of 'structure'. This is concerned with the linear arrangements in sequence of elements of clause structure. Halliday's description recognizes the clause to be made up of four elements – subject, predicator, complement and adjunct. In this section he describes 'symbols' as occurring at 'places' in the clause, and as representing 'elements of

[17] See also the networks presented in Chapter 8.

English clause structure'. And he continues: 'all clause structures can then be stated as combinations of these four in different places: SAPA, ASP, SPC, ASPCC, etc' (1961/76:61). There is no explicit statement about TRANSITIVITY, but at this point Halliday is in effect saying that a clause can have a subject and zero, one or two complements.

To summarize 'Categories', we may say that Halliday's main concern here is with what the clause might 'do' **syntagmatically**. He isn't yet raising TRANSITIVITY from its traditional domain of the unit of 'word' (verb) to the unit of clause and, although he introduces the idea of system and delicacy, he does not relate this to TRANSITIVITY, and there is, therefore, no statement about TRANSITIVITY in **paradigmatic** terms.

3.1.4 'Systems of the Clause: Transitivity', Halliday (1964/76)

Halliday's first published system network showing how TRANSITIVITY might be modelled is presented in Kress (1976). The date for this network is 1964, and so it is the next development in this sequential description as well as being the logical next step after the introduction of the new emphasis on the concept of the system. A reproduction of this network is provided at Figure 3.1. The method behind this system is described in 'Categories', and Figure 3.1 presents an actualization of the model proposed in 'Categories' – a system of choices, set on a cline of delicacy.

When one traverses the system, the starting point is the leftmost, 'least delicate' choice: that between two types of Process (the extensive type versus the intensive type), ultimately arriving at the 'most delicate' choice (for this network, at least): determining what type of complement will occur, e.g. [Goal receptive] versus [Beneficiary receptive].

Here, unlike in 'Categories', 'system' is elevated over the other three categories, and it 'emerges as the pivotal grammatical category' (Kress, 1976:99). A full description of this network and how Halliday developed the system for TRANSITIVITY to this stage in 1964 is given below in the discussion of Halliday's (1967) 'Notes on Transitivity and Theme, Part 1'.

The network is accompanied by a set of 'realization statements' (1964/76:111). These give an idea of the possible 'surface forms' that might result from a traversal of the network.[18]

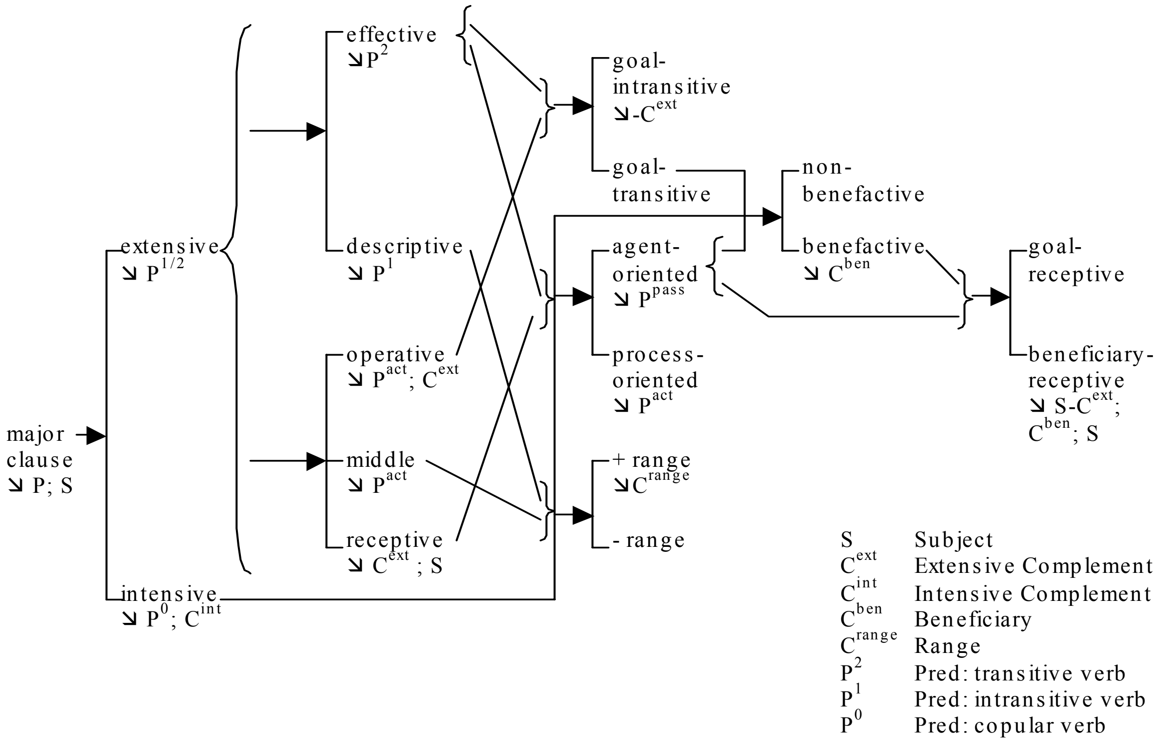

Figure 3.1 'Systems of the Clause: Transitivity' Halliday 1964/76:110

Through this explicit network, combined with the realizations given below each feature, we are able to envisage exactly how a traversal of the network, making more delicate choices, might enable 'lexis' to be incorporated into a single system with grammar, and Halliday states that 'The selection of any one feature specifies, through an accompanying realization statement, how, and by what item, the feature is to be realized in structure.' (Halliday 1966/76).

Further explanation of this 1964 network will be delayed until Section 3.1.5, as it is not until 1967 that Halliday provides a clear description, and the networks of 1967 are almost identical to that in Figure 3.1.

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[18] Halliday adopts the term 'realization' in his paper 'Deep Grammar' (1966), and from this point it takes the place of the earlier 'exponence'. The term 'realization' was originally Lamb's term, and, as we shall see in due course, it was to come to be used in conjunction with the description of system networks throughout the theory.

3.1.5 Transitivity in Halliday's 'Notes on Transitivity and Theme, Part 1' (1967)

The topics covered by this paper are: (1) a limited description of Process types (limited, that is, in comparison with the later work in this area - Halliday, 1985/94 - as discussed in section 3.1.14), (2) the grammatical features used in describing the Process types recognized, and (3) a description of the Participant Roles recognized at this time. Before this description, TRANSITIVITY had been considered in terms of a verb in a clause being either 'transitive' or 'intransitive', but here Halliday is introducing the 'factual-notional structure of the clause in its entirety. In other words, all those features of the clause which contribute to the linguistic representation of the speaker's experience.' (1969/76:159). This leads to the notion of 'Process types'.

The first factor to note about this description is that the 'Process types' recognized in later work, such as [material], [relational] and [mental], are not overtly clear at this point. Here, Halliday recognizes Processes concerned with 'doing' (relating to action and perception, (Halliday, 1967:39)), and Processes of 'being' (relating to description and identification (Halliday, 1967:39)). Further to this, the Participants recognized in these Processes are primarily 'actor' and 'goal', with a slightly later introduction of 'initiator' and 'attribuant'.

It seems that at this point the Participant Roles are not semantically based, as they are in Halliday's later writings. He makes use of superscripts (which are also evident in his 1964 network) to map the Participant Roles onto the elements in the clause, and so distinguishes semantic types at this second degree of delicacy in the structure. These roles are not generated through the network as the other aspects of the TRANSITIVITY system are. The possible choices in the network can be seen in Figure 3.2.

One point of interest is that in Figure 3.1 we saw that the superscripts on the elements provided semantic labels for the features in the network. In the network shown in Figure 3.2 Halliday does not give superscripts for the semantic labels, but, judging by Halliday's 'structural realization' (1967:48), these seem to be applied at some later point and not before in the generation.

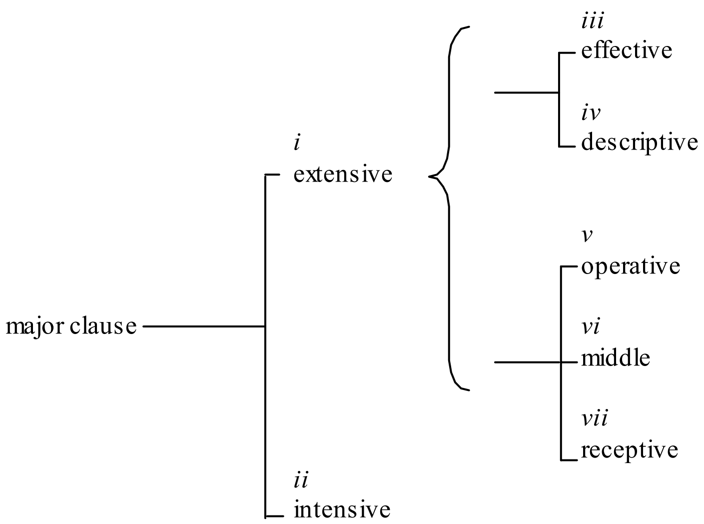

Figure 3.2 from Halliday, 1967:43

This network allows for the generation of the following. If (i) [extensive] Process is chosen, then the Process will be of ‘action’, e.g. the verb ‘to wash’ and the clause in example (1):

(1) She washed the clothes.

If (ii) [intensive] Process is chosen, then the Process will express the ‘ascription’ of some ‘attribute’ to a given Participant, e.g. ‘seem’, as in (2):

(2) She seemed happy.

On choosing [extensive], two simultaneous systems are entered. The first is that of (iii) [effective] and (iv) [descriptive], the second is that of (v) [operative], (vi) [receptive] and (vii) [middle].

If (iii) [effective] is chosen, then the Process will be ‘action’ directed at a ‘goal’, e.g. ‘the clothes’ in example (3):

(3) She washed the clothes.

If (iv) [descriptive] is chosen, then the Process will be ‘non-directed action’, as with example (4):

(4) The prisoners marched.

i.e. there will not be a ‘goal’.[19]

The second system – of v, vi and vii – introduces more detail about the roles of the clause. These systems can each be either effective or descriptive.

If [effective] and [operative] (iii/v) are chosen, then the Subject of the clause will represent the Actor, e.g. ‘she’ in example (5):

(5) She washed.

and in (6):

(6) She washed the clothes.

If [descriptive] and [operative] (iv/v) are chosen, then the Subject will represent the ‘Initiator’ of a non-directed action, performed by another Participant, e.g. ‘he’ in example (7):

(7) He marched the prisoners.

If [effective] and [receptive] (iii/vii) are chosen, then the Subject will represent the Goal e.g. ‘the clothes’ in example (8):

(8) The clothes were washed.

If [descriptive] and [receptive] (iv/vii) are chosen, then the Subject will represent the Actor who performs a non-direct action, e.g. ‘the prisoner’ in example (9):

(9) The prisoners were marched.

[19] This is an odd example, because it involves a third Participant Role that is omitted in this case, i.e. ‘marching’ inherently involves a Participant Role that is a direction. This will be addressed later in the present section.

If [effective] and [middle] (iii/vi) are chosen, then the Actor and Goal represent the same thing, thus producing a reflexive clause, e.g. ‘she’ and ‘herself’ in example (10):

(10) She washed (herself).

If [descriptive] and [middle] (iv/vi) are chosen, then the Actor and Initiator represent the same thing, e.g. ‘the prisoners’ in example (11):

(11) The prisoners marched.

I have difficulty accepting as ‘paradigm’ examples (iii/v), (iv/vi) and (iv/vii), because all these examples require a ‘direction’. In Fawcett’s framework, the Participant Role ‘destination’ or another Participant Role of direction would be recognized, even if it is realized covertly. The examples given by Halliday to illustrate the network beg the questions presented in examples (12) and (13):

(12) Where did the prisoners march to?
(13) Where were the prisoners marched to?

Halliday is concerned with one further role at this point: that of ‘Attribuant’, which occurs in a clause of ascription, i.e. ‘intensive’ Process, indicated by (ii) in the network.

An important factor about TRANSITIVITY, as Halliday describes it in this paper, is that a Participant may be covert. That is to say, a function or role can be obligatory to the Process, but not overtly realized in the structure and so ‘the expression of any given Participant Role is not obligatory’ (1967:44).

This leads to a further connected network (Figure 3.2.1), with choices between ‘the presence and the absence of a complement as goal’ (1967:46), and also the distinction between [process-oriented] and [agent-oriented].

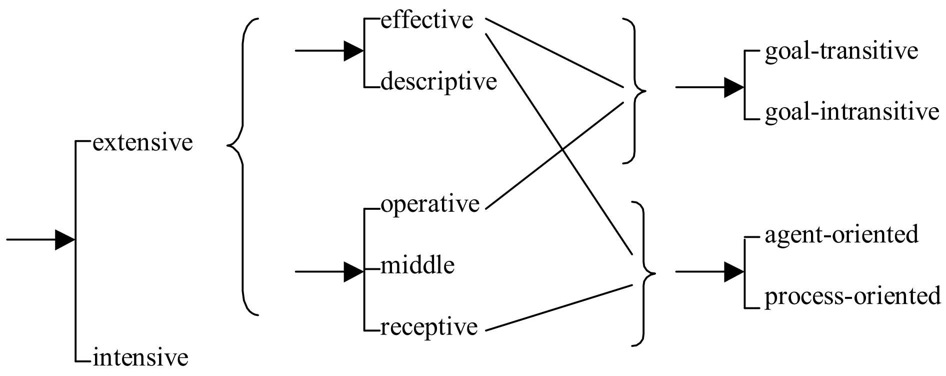

Figure 3.2.1 from Halliday, 1967:47

If [goal-transitive] is chosen, then the Goal is made explicit, as in (6): *she washed **the clothes***. And thus, if [goal-intransitive] is chosen, then the Goal is covert, as in example (5) above.

Similarly, if [process-oriented] is chosen, then the Process will be ‘active’ as in example (6a):

(6a) The clothes washed easily. (Halliday, 1967:47).

or if [agent-oriented] is chosen, then the Process will be ‘passive’ as in example (6b):

(6b) The clothes were washed. (Halliday, 1967:47).

Having discussed what features might occur in the clause for the types explored so far, Halliday suggests further possible Participant Role types. He calls these ‘circumstantials’, and although in this thesis we are not concerned with Circumstances,[20] these further roles need to be assessed with regard to the fact that they have been traditionally given a place in ‘transitivity’, especially by those scholars concerned with ‘case’ - see the discussion in Chapter 2 of Fillmore (1968a) and Lyons (1968).

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[20] At least not in the Cardiff Grammar framework’s definition of Circumstances.

The first ‘circumstantial’ as Participant Role (1967:53) that Halliday described is that of ‘beneficiary’. This is described as the role that is the ‘beneficiary’ gaining from the Process, e.g. ‘John’ in (14):

(14) John was given the book.

And Halliday notes that this is a Circumstantial Role because ‘structurally, (it) may be realized by the clause element “complement”’ (1967:53). His description of the ‘beneficiary’ states that it is not usual for an ‘inanimate’ Participant to occur as ‘beneficiary’ unless in a quasi-metaphorical usage, as in examples (15a) and (15b):

(15a) Give that door another coat of paint.
(15b) Loyalty is owed some recognition. (Halliday, 1967:55).

According to Halliday, the ‘beneficiary’ is the **indirect object** of the clause and is moveable within the clause: it can occur at Complement as in (16), at Subject as in (17), or as Adjunct (in Halliday’s terms), as (18):

(16) He gave John some coffee.
(17) John was given the book.
(18) He gave the book to John.

This leads to an obvious grouping of Process types, i.e. Processes that typically occur with a ‘beneficiary’ in the clause. This notion of groupings is very important for the formulation of Halliday’s theory of TRANSITIVITY. He states that ‘the class assignment of any verb is in effect a specification of those clause features which determine its potentiality of occurrence. In this way verbs will be found to group themselves into semantically related sets.’ (1967:52). This concept of ‘semanticizing’ related sets is one that we have seen in Chapter 2, and one that we will find ourselves returning to continually throughout this thesis.

While Halliday illustrates that the recognition of a Participant serving the role of ‘beneficiary’ leads to a semantically related set of verbs – in particular he recognizes *give, show, sell, pay, owe, charge, pass, throw, hand, book, keep, offer, promise, tell* – he does not at this stage recognize the group in terms of a PROCESS

TYPE. As we shall see later in this chapter (Section 3.1.14), this semantic set (plus other verbs of a similar type) will be classed by Halliday as 'relational' Processes of 'possession'.

The next 'circumstantial' PR described by Halliday is that of 'range'. 'Range' is described as 'specify(ing) the extent of (the process's) scope or relevance' (1967:58). Unlike the 'beneficiary', the 'range' will typically be 'inanimate'. Halliday states that the distinction between 'range' and 'goal' is not clear cut. The 'beneficiary' function is an easily recognizable element of the clause, and is a tangible concept, and a semantic label describing the function of the role. However, the 'range' is different in that it is – like the 'goal' – an extension of the 'actor' and 'process' relationship.

The 'range' is typically found to occur with the Process type 'descriptive', i.e. non-directed action. In a lot of cases it can actually be a nominalization of the process, as in example (19):

(19) She sang a song. (Halliday, 1967:59).

In such cases then, there is an expectancy of collocation between the verb and the noun.

The description of 'range' so far is as an optional role in the clause (typical of descriptive processes). However, Halliday suggests that an obligatory 'range' occurs in the clause in example (20), 'in which the process … is entirely expressed in the nominal event, the verb merely specifying that there is a process involved.' (1967:60).

(20) He had a bath.

By objectifying the process – with the introduction of a 'range' – a 'beneficiary' can be allowed to occur, as in example (19a):

(19a) She sang John a song. (Halliday, 1967:60).

Halliday suggests that because of this the ‘range’ is acting as a Participant, or as he more specifically labels it, a ‘pseudo-participant’ (1967:61)[21].

The last two Circumstances to be discussed in the 1967 paper are ‘attributive’ and ‘conditional’. With both of these the ‘transitivity system provides the means for “objectifying” such circumstantial elements as properties of the Participants in the clause.’(1967:62). Examples of ‘attributive’ roles are given in (21) and (22):

(21) She lay drowsy.

(22) He drinks his coffee black. (Halliday, 1967:63).

An example of the ‘conditional’ role is given in example (23):

(23) You can’t eat them raw. (Halliday, 1967:78).

Halliday points out that with this example the role would be more explicit with the insertion of ‘if’, as in example (23a):

(23a) If they are raw you can’t eat them.

Both of these last two roles to be described can only occur at the position of Complement in the clause (unlike the other roles which we have looked at, which may occur at the position of Subject). Moreover, they cannot be nominal groups with a proper noun, a pronoun or a determiner at the head.

In this section I have described the features of the system network in Halliday 1967, and also the possible functions that can occur with the various clause types that their features define. Coming just six years after ‘Categories’ (1961), where Halliday simply specified that the clause can have zero, one or two complements, this represents a great advance. However, as we shall see in the rest of the chapter, further changes to and expansions of the system network will occur.

[21] Halliday 1967 states that the Range cannot be considered a full participant, but he does not give a full explanation for why this should be so; ‘while the goal is treated by the language as a full participant in the process, the Range is still only a pseudo-participant.’ (Halliday 1967:61)

3.1.6 Transitivity in Halliday's 'Notes on Transitivity and Theme, Part 3' (1968)

Halliday was clearly dissatisfied with his 1967 description of TRANSITIVITY, and in Part 3 of 'Notes on Transitivity and Theme' he returns to the topic with revised proposals. Part 3 is both a review and a refinement of the 1967 descriptions of TRANSITIVITY. Importantly, this paper introduces the notion of 'causation' into TRANSITIVITY.

Halliday refers back to Part 1 of 'Notes' writing; 'I suggested that the underlying form of clause organisation in English, on the dimension of TRANSITIVITY, might be of the ergative rather than, or at least as well as, of the transitive type.' (1968:182). He goes on to recognize that the 'ergative' is the predominant pattern in modern English.

So far the descriptions we have considered have involved 'transitive' (in its traditional sense) constructions. This concerns either an 'actor' performing a deed, or an 'actor' with the deed extended to some 'goal'. The importance of the introduction of ergativity can be understood when one finds these roles to be unsuitable for the description of all Process types in all contexts. Halliday suggests that 'actor' and 'goal' are not always appropriate as the labels for PRs, and he highlights the value of introducing the feature 'causative', and further relevant role types. Most important is the introduction of the term '**affected**', which seems to be an appropriate label for describing the semantic role involved in many Process types, and concerns what HAPPENS to the Participant. Halliday attributes the term 'affected' to Fillmore (1966:4-5)[22], and he states that it is Fillmore's function of ergative 'for which I used – and retain here – the term affected' (Halliday 1968:185).[23]

Halliday states that the 'affected' entity is obligatory in ergative clauses, and as such is the 'sole obligatory function' (1968:185). The second Participant of such a clause is the optional 'causer'. An 'ergative' Process may occur in two clause types: one with just an 'affected', as in example (1), and one with an 'affected' and a 'causer', as in example (2):

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[22] (Fillmore 1966:4-5): "It seems to me that … there is a semantically relevant relation between 'the door' and 'open' that is the same in the two sentences 'the door will open' and 'the janitor will open the door', in spite of the fact that 'the door' is the Subject of the so-called intransitive verb and the Object of the so-called transitive verb … It is this function for which I used the term 'affected'".

[23] For the Cardiff Grammar's use of this term, see Chapter 5.

(1) The window broke.

(2) John broke the window.

Halliday further suggests that there are instances ‘where there is no external causer’ (1968:188), and so the obligatory ‘affected’ entity and the optional ‘causer’ combine with the result that two roles are realized as one Participant. To exemplify this he gives the example (3) where *Mary* is a ‘causer/affected’:

(3) Mary washed. (Halliday, 1968:188).

The difference between the ‘transitive’ approach to TRANSITIVITY, as described in Part 1, and the ‘ergative’ approach is that:

> ‘instead of a ‘transitive’ form of organisation, based on extension, where the question is whether the action extends beyond the actor or not, the alternative … is an ‘ergative’ form of organisation, based on causation, where the question is whether the cause is external to the action or not.’ (Halliday, 1968:185).

A further distinction that Halliday makes between the transitive and the ergative is that transitive functions are ‘fundamentally those of action clauses’ (1968:188), whereas ergative functions ‘seem to be common to all types of process and, in fact, to all clause types, including relations and mental processes.’ (1968:189).

Interestingly, this is the first time that the ergative/transitive distinction has come into Halliday’s discussion. He goes on to recognize that the structure of ‘action’ clauses in terms of ergative patterning suggests some ‘tentative observations concerning other clause types’ (1968:190).

I will now examine Halliday’s description of these other Process types in his 1968 paper. Essentially, it signals a further stage in the development of his concept of TRANSITIVITY towards a more ‘semantic’ system network.

The first type to be discussed is the Process that prototypically uses the verb *be*. It relates to the description of ‘intensive’ clauses, (see the discussion of Halliday 1967 above), which he recognizes as a Process of ‘ascription’, assigning an ‘attribute’, as in example (4):

(4) Mary is happy.

The Participant Role assigned to *Mary* in this example is '**carrier**'.

The alternative choice to [intensive] is [equative], and relates to 'an identifier to a thing being identified' (1968:190), as in example (5), where *John* is also the 'carrier'.

(5) John is the leader.

It appears (although it is not made explicit at this point) that the 'intensive' and the 'equative' are sub-classes of what will later come to be known as a 'relational' Process, and so would be modelled in a network as in Figure 3.3.

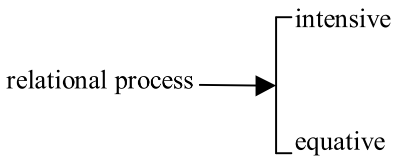

Figure 3.3 An early 'relational process' system network

His descriptions of 'intensive' and 'equative' centre around a 'relational' notion; 'ascription is an inclusion relation, equation a relation of identity' (1968:190), and he suggests that they are involved in a kind of 'coding relation' (1968:191).

The last 'major type of clause' described in the 1968 paper is that of 'mental' Processes. He explicitly describes this as a Process type which expresses consciousness; 'perception' (*see*, *look*); 'reaction' (*like*, *please*); 'cognition' (*believe*, *convince*); and 'verbalization' (*say*, *speak*).

Halliday suggests that the examples (6a) and (6b) show the possibility of an ergative patterning of analysis, with 'everybody' functioning as 'affected'.

(6a) The play pleased everybody.

(6b) Everybody liked the play.

However he also suggests that it is possible to recognize that a transitive analysis is still feasible, with the structure 'Actor + Process + Goal' in both examples. Specifically, he states that 'the play' seems to be functioning as a 'Phenomenon' that is 'processed', thus introducing a more semantically based analysis of the roles involved. In a 'mental' Process such as 'liking', the application of the roles 'Actor' and 'Goal' do not seem appropriate: this is not a Process of 'doing' or 'happening to', which would be the test for the appropriacy of these role types. Halliday states that 'with *please* it [the Participant Role] may be regarded as a causer but with *like* it functions as defining the scope of the reaction and is not unlike the range [therefore] … *everybody* is affected in both cases, *the play* being (phenomenon as) causer with *please* and (phenomenon as) range with *like*'. (1968:193-4).

3.1.7 Halliday (1970) 'Language Structure and Language Function'

In this next paper, Halliday introduces a shift in his description of TRANSITIVITY. Now that **system** has been elevated from its position in 1961 – as just one of four categories – to a more prominent status in the theory, Halliday begins to introduce in this paper the notion that the **meaning potential** of a language is modelled by choices in a 'system network'. In describing the function of language, Halliday recognizes 'an act of speech … as a simultaneous selection from among a large number of interrelated options. These options represent the 'meaning potential' of language.' (1970:142).

Importantly, Halliday stresses here that modelling the meaning potential in a **system** helps us to understand the **structure** (much in the same way that we shall see Muir 1972 adopts, in Section 3.1.8 below). He emphasises the importance of what the 'Prague school' have always advocated, i.e. the 'synthesis of structural and functional approaches' (Halliday 1970:141). And he carries this holistic view through to his description of TRANSITIVITY.

In Halliday's earlier works (e.g. Halliday 1961, 1964, 1967 and 1968) the focus for discussing TRANSITIVITY was on what clause structure would be produced from the systems. In a departure from this, in this 1970 paper he is emphasising the SEMANTICS of the clause, describing it in terms of Process types and the Participants. It is in this paper that he clearly lays out the importance of discovering the function of language through the examination of language use. He disputes the necessity of observing a dichotomy between ‘competence’ and ‘performance’ by recognizing that what we need for the understanding of language is derivable ‘in relation to the situations in which it is used’ (1970:145).

Halliday emphasizes in 1970 how the **metafunctions** are reflected in the clause, and how the Process types and Participants are located at the centre of what he is at this point calling the ‘ideational’ metafunction. Through this part of the language the user is able to construe experiences, and he defines the ideational metafunction by stating that:

> ‘in serving this function language also gives structure to experience, and helps to determine our way of looking at things, so that it requires some intellectual effort to see them in any other way than that which our language suggests to us’. (Halliday, 1970:143).

The three major Process types that Halliday recognizes at this stage are ‘action’, ‘mental’ and ‘relational’, and he considers these types to be classifications in terms of semantic roles. As we saw with his treatment of ‘mental’ Processes above (Section 3.1.6), the roles of ‘actor’ and ‘goal’ do not encompass everything that needs to be captured semantically. In this paper he introduces a number of new, more semantically based roles as a departure from simply recognizing a clause such as (1) as being ‘transitive’, and thus involving a ‘Process’ plus an ‘Actor’ plus a ‘Goal’:

(1) Sir Christopher Wren built this gazebo.

He introduces the new roles that he recognizes as being ‘subclassifications’ of the roles ‘Actor’ and ‘Goal’.

Halliday builds on Sweet’s (1891) distinction between ‘logical’ and ‘grammatical’ categories (1970:147). He uses the example (2) to illustrate that while *the book* is the **grammatical subject** in this clause, it is the **logical direct object**:

(2) The book sells well.

He links this notion of ‘logical categories’ with his proposed roles (or ‘participant functions’, as he also refers to them), so that the roles of ‘Actor’, ‘Goal’ and ‘Beneficiary’ relate to ‘logical subject’, ‘logical direct object’ and ‘logical indirect object' respectively. The implication is that these concepts of 'Actor', 'Goal' and 'Beneficiary' are in line with Sweet's 'logical categories', and that the **elements of structure** in the clause (i.e. Subject, Object, Complement) are in line with Sweet's 'grammatical categories'. We saw in Section 3.1.4 how Halliday conflates these in the analyses of clauses by the use of superscripts.

The description of TRANSITIVITY in this paper highlights the subclassification of these 'logical categories', or 'Participant Roles/Functions' for further semantic specification of what is 'going on' in the clause.

The additional roles to 'actor', 'goal' and 'beneficiary' that Halliday proposes are 'instrument', 'force' and two types of 'recipient'. We will first consider the two types of 'recipient'. In Halliday's description he suggests that the role 'beneficiary' can be split into two types of 'recipient': 'recipient of an object', as in (3), and 'recipient of a service', as in (4):

(3) I've given Oliver a tie.

(4) I've made Frederick a jacket.

However, it is interesting that he does not distinguish these two types in terms of 'inner' and 'outer' roles, or 'participants' and 'circumstances'. In the Cardiff Grammar it is proposed that in these two examples, (3) involves three Participants while (4) involves two Participants plus one Circumstance. Thus, a split can be detected in the functioning of the role that Halliday terms 'beneficiary'.

We shall secondly consider his introduction of the roles 'instrument' and 'force'. The role of 'instrument' is found in an INTENTIONAL action, as in example (5):

(5) The key opened the door.

The role of 'force', however, is found in a NON-INTENTIONAL action, as in example (6):

(6) The window was broken by the ball.

He defines this 'force' as functioning to describe the role of an inanimate instrument. I would add that it seems to be a useful label, not in terms of a type of instrument, but as an informal description of one type of 'Actor' or 'Agent'.

It is interesting to consider these roles in the light of the discussion of 'logical' and 'grammatical' categories. If we take the notion of 'logical' to be that which describes 'real world' happenings, we are able to ascertain that 'logically', *the key* and *the ball* are used by a 'real world' 'actor' or 'agent'. Therefore it is sensible that the role of 'actor' is not extended to encapture this meaning, and that these new roles are proposed. Interestingly, as we shall see both below in this chapter, and also in Chapter 5, these roles are not included in Halliday's current framework, and are also not used in the Cardiff Grammar framework. In the Cardiff Grammar, these roles are included as either Circumstances of 'manner', as in example (7), or as 'pseudo-agent', where the 'real-world' do-er of the action is not recoverable in any way from the text, as in example (8):

(7) Belle opened the door *with a key*.
(8) The key opened the door.

As with this functioning in the Cardiff Grammar, Halliday's description of Circumstantial Roles and their function in the clause recognizes that 'relational' Processes can be expected to involve three inherent roles, whereas 'action' Processes involve two inherent roles and perhaps a Circumstantial Role, for example, involving the Circumstance of 'place' as in examples (9) and (10):

(9) He was throwing stones *on the bridge*.
(10) He lost all his jewels *in the wash*.

However, at this point he does not overtly recognize these Processes as 'relational'. The types that he considers to be 'relational' have been met before (in Halliday 1968, as described in Section 3.1.6), but not with the 'relational' label. Here, subclasses within 'relational' Processes are described. The first type is said to display 'a relation of class membership' and he calls this the 'attributive' ('intensive' in Halliday 1968:190). The second type is 'where one (role) serves to identify the other' and he calls this the 'equative' (1970:154). The distinction between these two is that the ‘equative’ Process is reversible, as in (11), and the ‘attributive’ Process is non-reversible, as in (12):

(11) Temblecombe is the treasurer.

(12) Marguerite looks desperate. (Halliday, 1970c:154).

With regard to the roles inherent in these two Process types, ‘attributive’ Processes have an ‘attribute’ associated with them, and ‘equative’ Processes have an ‘identifier’.

As well as ‘action’ and ‘relational’, the further major Process type he describes is ‘mental’. In this paper he recognizes semantically defined labels for the roles involved in ‘mental’ Processes. He proposes first the role of ‘processor’, and second some entity that is being ‘perceived’, ‘reacted to’, ‘cognized’ or ‘verbalized’, and for this he continues to use the label ‘phenomenon’ (as in 1968).

In his discussion of ‘mental’ Processes he gives an early indication of the importance of **probability**, i.e. the likelihood of occurrence of features. He highlights the fact that the ‘non-middle’ clauses either have the ‘phenomenon’ or the ‘processor’ as subject, and that the probability of a passive construction is higher with the type with the ‘phenomenon’ as subject type; compare (13) and (14)

(13) The gift pleased her.

(14) She was pleased by (with) the gift. (Halliday, 1970:153).

From this description we can determine that the introduction of semantically based labels for the PRs in the clause enables a more detailed analysis of how the clause is functioning. Halliday proposes what might be understood as a system network for the VOICE system, and the choice of [non-middle] leading to the possibility of an active or a passive clause. As we have seen with his treatment of ‘mental’ Processes in particular, the labels ‘phenomenon’ and ‘processor’ lead to the recognition of the function of an active or a passive construction.

Having considered Halliday’s definitions for what he recognizes to be three main Process types, this chapter will now look at the interpretations of other scholars of his work in this period. In the early 1970s Halliday’s theory found widespread appeal, and on the basis of his theory a number of introductory texts emerged which presented introductions to his ideas. Here I shall take the presentations in Muir (1972), and Berry (1975 and 1977), as useful interpretations of Halliday's concept of TRANSITIVITY. It should be noted that these two presentations are chiefly based on Halliday's descriptions prior to this 1970 paper, and therefore do not include the overtly semantic PR labels.

3.1.8 Muir's A Modern Approach to English Grammar (1972)

This work was 'intended to present a description of English grammar which is based on a particular theory or "model" of linguistics' (1972:ix), i.e. Systemic Functional Linguistics. It provides a useful perspective on Halliday's writings for the purposes of this history of TRANSITIVTY. Perhaps the most important contribution of this book lies in the way in which it is organised. Muir emphasises a distinction between 'surface grammar' and 'deep grammar', and this theme is emphasised throughout, describing separately 'structure' and 'system' (and so concurrently 'chain' and 'choice').

Muir recognizes the system network for TRANSITIVITY as part of the 'deep grammar'. This reflects Halliday's ideas presented in 'Deep Structure' of 'structure … as the realization of complexes of systemic features' (Halliday 1966/76:94), and thus choices made in a system – here specifically TRANSITIVITY – leading to surface structure.

Muir gives a simplified account of the system for TRANSITIVITY as originally found in Halliday 1967 (Section 3.1.4 above). Using Halliday's nine examples of clauses (1967:47) Muir describes TRANSITIVITY by moving through each system, and for each clause he gives the systemic description. For example, he usefully summarises the view that the functional structures are the realization of the choices between 'extensive' and 'intensive'; 'effective' and 'descriptive'; and 'operative' and 'receptive', as in Table 3.1. This presentation is clear and intelligible, and in fact it represents an advance in this respect on Halliday's original presentation.

Example	Structure	Systemic description
(i) *The barber shaved ten customers*	SPC	
extensive:effective:operative		

(ii) *Ten customers were shaved*	SP	extensive:effective:receptive
(iii) *The soldiers marched*	SP	extensive:descriptive
(iv) *Mary seemed happy*	SPC	intensive

Table 3.1 Muir, 1972:110

Muir also emphasises that **semantic roles** are produced by specific choices in the network. But he does not attempt the conflation of these roles/functions with the structure, as Halliday does in 1967 with the use of superscripts. Whereas Halliday states that elements can be 'further specified by the addition of superscripts: e.g. P^{act} (active predicator), C^{int} (intensive complement).' (1967:39), Muir keeps the two types of structure separate. This follows naturally from the structure of the book, with its separation of surface grammar and deep grammar. In his section on TRANSITIVTY, the only statement on structure is the assertion that 'we can predict structure from system, but not system from structure' (1972:115). It will be interesting to see in further accounts of TRANSITIVITY, whether this is still considered to be the case.

In his account of TRANSITIVITY Muir foregrounds two main premises. Firstly he highlights the importance of the deep level system as that which defines the structure, and he states that 'if we consider structure as the way in which systemic features are realized we can assign unambiguous descriptions to each clause' (1972:115). Secondly he emphasizes the importance of the relation between 'Process' and 'Participant', and how Participants are not 'tied to any one element in clause structure' (1972:106). Ultimately however, as we have seen with Halliday's elevation of the notion of system in language, the system is realized in structure.[24]

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[24] Huddleston highlights the fact that in systemic grammar **realization rules** are represented by the insertion of superscripts into the structural representation; 'the addition to a function label of a superscript defining the syntagmatic function more delicately.' (Huddleston, 1966/81:65).

3.1.9 Berry's Introduction to Systemic Linguistics, Volume 1: Structures and Systems (1975)

Berry (1975) presents a different network to that of Halliday (1967) and Muir (1972). Hers is largely based on the Process types that Halliday proposes in 1968 and in 1970. I have presented Berry's description in system network form in Figure 3.4.

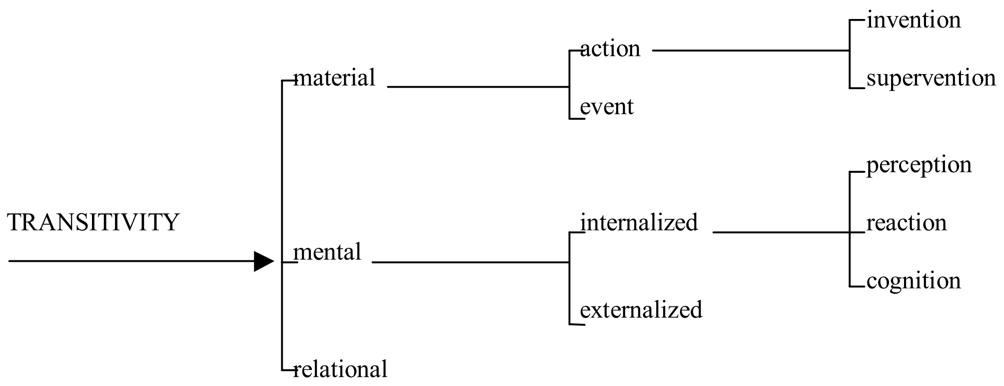

Figure 3.4 Based on Berry 1975:150,151,152

Berry presents an interesting difference to the TRANSITIVITY that has been presented so far. She introduces the Process type 'material', which she then subclassifies into 'action' and 'event'. For Halliday, these two have been subsumed as 'action'.

The aspects of the system network for TRANSITIVITY that are included in Halliday's 1967 network – such as the overtness or covertness of a role in surface structure, and passivity – are presented by Berry as aspects of the VOICE system, which is line with what Halliday implies for the VOICE system in 1970. Berry combines the VOICE system network with the TRANSITIVITY network by 'simultaneity'. Berry says that 'a system is **simultaneous** with another system if it is independent on the other system but has the same entry conditions as the other system.' (1975:182).

In the simultaneous networks of TRANSITIVITY and VOICE in Figure 3.5, we can recognize examples of 'complex dependency' in the production of 'the Active/Passive System and the Systems on Which it Depends', in terms of how 'a system network has more than one possible point of entry' (Berry, 1975:86). These two aspects of the network - simultaneity and complex dependency - display the complexities of language that the theory can model.

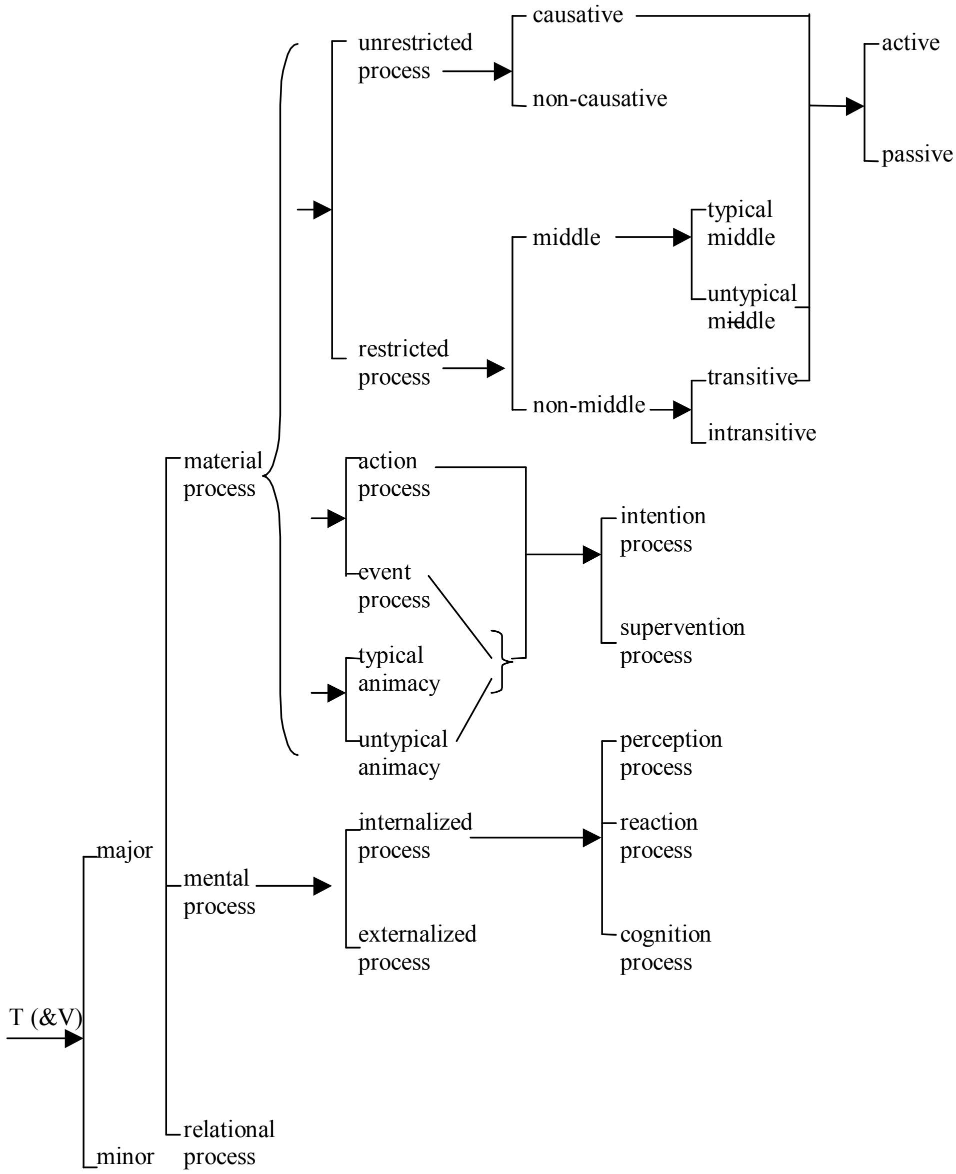

Figure 3.5 Berry's System Network for TRANSITIVITY and VOICE (T & V) (1975:189)

This network is based on Halliday (1970) in that it focuses on the Process types in terms of contrasts between 'material' (although in 1970 this was 'action'), 'mental' and 'relational' Processes. The networks and descriptions of TRANSITIVITY before Halliday (1970) do not recognize these clear Process type distinctions, and, as we have seen, in earlier writings Halliday proposes different groupings for Processes, but the only such differences introduced thus far are between 'action' and 'ascription', or 'doing' and 'being' (Halliday 1967:39). What can be seen in Halliday (1970) and thus Berry (1975) is a description of TRANSITIVITY that is a further step towards a semantically oriented system network, where further Process types are proposed.

3.1.10 Hudson's English Complex Sentences (1971)

At this point, having considered Halliday's notions of TRANSITIVITY up to 1970, and having examined the text books which interpret and present Halliday's theory, we shall examine cases of what we might call 'branch theories' – i.e. theories which are based on Halliday's concepts, but which also include new aspects.

The first branch theory to be considered is that presented in Hudson (1971). He presents a version of Systemic theory to model the grammar of *English Complex Sentences*. The fact that he attributes importance to the notion of 'system' is demonstrated by his use of system networks[25]. In this 1971 work he is operating within the 'aims of a Systemic Grammar' (1971:1), and presents his book as 'an introduction to Systemic Grammar'. However, as I shall demonstrate, his ideas differ significantly from those of Halliday at that time. The principle difference is that his grammar is primarily at the level of **form**, and there is no indication that the system networks model the 'meaning potential' of language.

Hudson's discussion of TRANSITIVITY is presented in terms of a system network. This system network has as its 'point of departure' the 'clause', and this 'clause' network occurs simultaneously with the system networks for 'phrase' and 'word'. All of these three (clause, phrase and word) have the same **entry condition** (the initial feature of the network, at the left-most side of the network) – i.e. the 'grammatical item'. This seems to be a means for modelling the 'rank scale' (Halliday 1961) in a system network, and Hudson describes it as 'involving both syntagmatic and paradigmatic relations' (1971:69). This is an interesting addition to the theory, as Halliday presents the rank scale as a 'top-to-bottom' relationship, and therefore a **structural** relationship, with constituency explained as clause consisting

[25] At this stage in his theory at least – in later developments of 'Daughter Dependency' (1976), his 'classification rule' is paramount.

of phrase, phrase consisting of word, etc (1961/76:58) – rather than in a **system**, as here in Hudson. Hudson's network for 'grammatical items' does not model such syntagmatic relationships, and he states that 'treating the relation among 'clause', 'phrase', etc. as a system which binds all the other systems together on the left is simply taking to its logical conclusion the principle … that the syntagmatic environment can predetermine the selection to be made from a system' (1971:70). It would be interesting to see how this would work in a truly generative grammar. Fawcett (2000a) explains that Hudson's system networks are at the level of form rather than meaning, and also that these formal units are generated through a 'composed of' relationship. Fawcett also states that in the Cardiff Grammar 'a broadly similar mechanism is used to determine what units can fill what elements in higher units – except that here it is interpreted in terms of a model in which the choices are between **semantic features** (rather than syntactic ones, as in Hudson's model)' (2000a:314).

Hudson's approach is cognitive, and so he states that for him 'the "truth" to which our grammars approximate has to do with the way in which the native speaker's knowledge of his language's grammar is stored in his brain' (1971:4). Although his system network for the 'clause', as part of the system for 'rank', does not indicate in any way how this aspect of language might correspond to a grammar stored in the brain, further on in the text Hudson produces a network to show the grammar for what he terms 'noun-clauses'. This network is intended to be representative of how a 'noun-clause' can be generated. He provides a definition for the phenomenon that he refers to as a 'noun-clause' by stating that 'in traditional grammars, noun-clauses are clauses acting as (or like) nouns; nowadays we should prefer to describe them as clauses functioning in ways characteristic of noun-phrases (rather than 'nouns')' (1971:161). He gives examples (1) and (2) as examples of 'noun-clauses'.

(1) He told me that it would be ready by Friday.
(2) He enjoyed just watching her.

Part of his system network for 'noun-clauses' includes some TRANSITIVITY. However, he indicates that the purpose of this system network is to realize a noun-clause, and so he states that the systems 'have been arranged here in such a way as to be most useful for our present purposes, rather than in order to reflect the suggestions of Halliday (1967, 1968) and Fillmore (1968) on "transitivity" and voice' (1971:247).

This claim suggests that he is not concerned with concepts such as 'Participant Role' or 'Case'[26]. It is therefore interesting to discover that Hudson does recognize the roles of 'actor', 'goal', 'attribuant', and what he terms 'completer' in the clause, and how these can be among the functions of the noun-clause, and are conflated with an element in the structure – i.e. Subject or Complement. The function of the noun-clause (i.e. the role that it will take) will be determined in the system for the 'matrix clause', and this will have been determined previously in the grammar to his system for noun-clauses.

In summary, we can determine that although Hudson's work centres on noun-clauses in complex sentences, these too involve options from the TRANSITIVITY system and he therefore takes the position, like Halliday, that the 'functions' or 'roles' of a clause are an important aspect of its realization. However, he does not relate this to **semantics**, and does not recognize the different Process types to which different configurations of roles belong.

3.1.11 Fawcett (1973/81), 'Generating a sentence in a systemic functional grammar'

The next piece of work to be considered is Fawcett's 'Generating a Sentence in Systemic Functional Grammar' (1973/81). Fawcett's ideas are like those of Halliday in that he regards the system networks as expressing the 'meaning potential'; but are also like Husdon's in that he presents a cognitive model of human communication.

He considers that a system for TRANSITIVITY should 'reflect … a large number of aspects of the performer's "knowledge of the universe"' (1973/81:161). In keeping with this notion, the features in his network for TRANSITIVITY are semantically based. The network is for the generation of Process types and the 'inherent roles' that accompany them, and Fawcett refers to these roles explicitly in the names of the features in the system (see Figure 3.6 below). The roles that are

[26] He calls these roles 'transitivity functions'.

generated can then be conflated with the elements of structure that are generated for the clause.

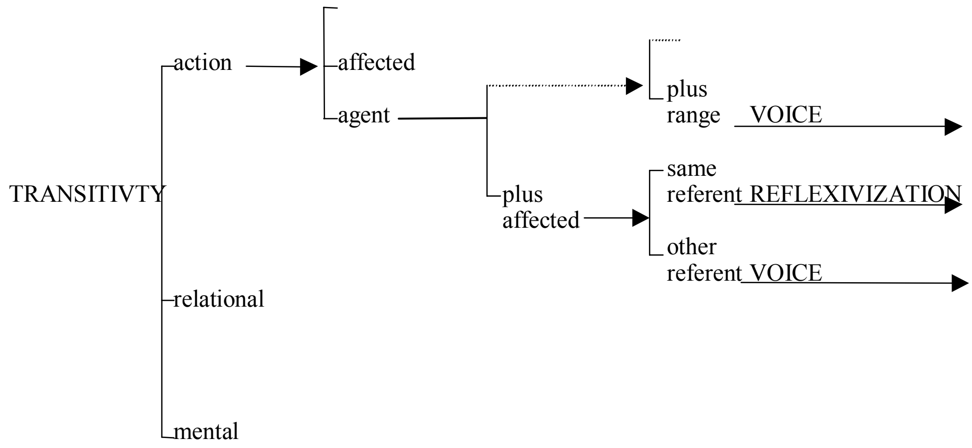

Figure 3.6 from Fawcett 1973/81:162

Interestingly, at this point in the development of his version of SFL, Fawcett sees the lexicon as a separate system for the generation of the lexical verbs. However, he recognizes the importance of specifying ‘in the lexicon exactly what transitivity classes each “cultural classification meaning” (i.e. each verb) can co-occur with.’ (1973/81:163). Therefore, at this early stage in the development of his theory, Fawcett is not attempting to generate the lexical verbs through the TRANSITIVITY network – which is exactly what the research to be presented here is attempting to do.

Fawcett does however allow for the ‘verb’ to be generated, and in this paper describes the system network for doing this which is entered simultaneously with the TRANSITIVITY system. This is the system of ‘CULTURAL CLASSIFICATION TO LEXICON’, and Fawcett states that ‘here the performer matches the referent-situation with the array of verbs that his language offers him, and selects an appropriate one’ (1973/81:165). It is implied therefore that choices made in the TRANSITIVITY system network (i.e. which determine the ‘referent-situation’) will influence the choices made in the CULTURAL CLASSIFICATION system network. But it is interesting that the entry condition for both these systems is at the same point, rather than the entry condition for CULTURAL CLASSIFICATION being dependent on the TRANSITIVITY system, as will be the case in generating ‘lexis as most delicate grammar’ (Halliday, 1961).

Although Fawcett 1973/81 does not present full system networks for all the Process types (as we can see in the reproduction of his system network in Figure 3.6) he describes the referent-situations of 'mental' and 'relational' as yielding further subclassifications, and we might model these systemically as follows:

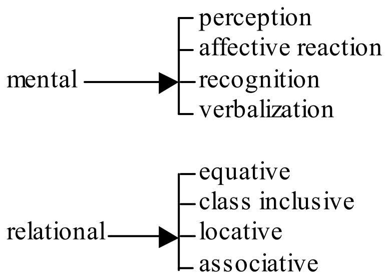

Figure 3.6.1 Network based on Fawcett's description (1973/81:164)

Moreover, he demonstrates that these Process types often require three inherent Participants, and are thus more complex than clauses of 'action'. However, 'action' is the concern of the clause to be generated in Fawcett 1973/81, because 'the sorts of inherent role associated with action processes best match the referent situation.' (1973/81:164).

In this paper (as opposed to his later work) Fawcett recognizes 'attribuant' to be a role inherent to certain 'action' Processes, and suggests that this role would co-occur with verbs such as *shine*, *glisten* and *limp*. However, such verbs are not generated in the TRANSITIVITY network itself, but they are part of the dependent CULTURAL CLASSIFICATION network. Fawcett explains that in the CULTURAL CLASSIFICATION network different senses of the same verb must be distinguished, and he illustrates this with the verb 'open'. He distinguishes two different meanings: one being 'to cause to be open', which he says has the realization:

M = *open* Ag Af (Main verb is expounded by 'open', and has the inherent roles Agent and Affected)

and the other being 'to become open', which has the realization:

M = *open* Af (Main verb is expounded by 'open', and has the inherent role Affected).

Fawcett concludes this section of the paper by stating that 'any adequate explanation of the lexicon will be a task of such complexity as to make any account of more than a limited area beyond our reach for some time to come.' (1973/81:167). At this point, Fawcett has taken up the challenge of Halliday's earlier (1961) indication of generating lexis through a system network. However, it is interesting that the means he provides for doing this do not involve the merging of grammar and lexis into the continuum of a single network, but rather as two networks equally dependent on each other, which are entered **simultaneously**. He states that in this paper he has 'tried to show how it is only by taking account of options in all the components *simultaneously* that the complex relationships between them can be modelled in a satisfactory manner' (1973/81:181). However, what this simultaneity does not encompass is how to account for the fact that choices made in the TRANSITIVITY network (i.e. the type of Process / the type of Role to be generated) may influence/direct the choices to be made in the lexicon[27].

In summary, we can say that the focus of what Fawcett is proposing in this early paper is a cognitive model of language, or 'a treatment of a grammar in which it is seen not as an entity on its own, but part of a mentality.' (1973/81:181). His network for TRANSITIVITY is SEMANTICALLY based, and has the semantic roles as features in the system, as well as functions to be mapped on to the structure, and it is on this that the current Cardiff Grammar framework for TRANSITIVITY is based (as shall be demonstrated in Chapters 4 and 5).

3.1.12 Halliday (1977) 'Text as Semantic Choice in Social Contexts'

If the focus of Fawcett 1973 was the placing of system in language in a 'mentality', and thus brought a PSYCHOLOGICAL APPROACH to the theory, then the next paper to be considered, by Halliday, concerns language and meaning-making occurring in social contexts, and thus views language from a SOCIOLOGICAL PERSPECTIVE. This section of the chapter therefore moves from the consideration of 'branch theories' to a description once more of the 'mainstream'.

[27] We shall in Chapter 4/5 that provision is made in the current framework of the Cardiff Grammar for this such problem of generation.

Here Halliday describes the ‘situations’ that occur in social contexts, and these include the ‘social action’ which he considers to be the ‘field’ aspect of his tripartite system of register – of ‘field’, ‘mode’ and ‘tenor’. Specifically, Halliday relates the ‘semiotic structure of situation’ (1977:201) of field to the experiential component of semantics.

In describing a Systemic Functional grammar as a means for producing a text – which is what he is doing in this paper – Halliday compiles a set of systems that become ‘a network that extends from the social system, as its upper bound, through the linguistic system on the one hand and the social context on the other, down to the ‘wording’, which is the text in its lexicogrammatical realization.’ (1977:207). This notion of ‘realization’ has occurred a number of times in this historical description of TRANSITIVITY. At this point, in combining **realization** with the ‘wording’, it is possible for the first time in Halliday’s work to ascertain exactly how he proposes that the **worded realization** might be generated by the system.

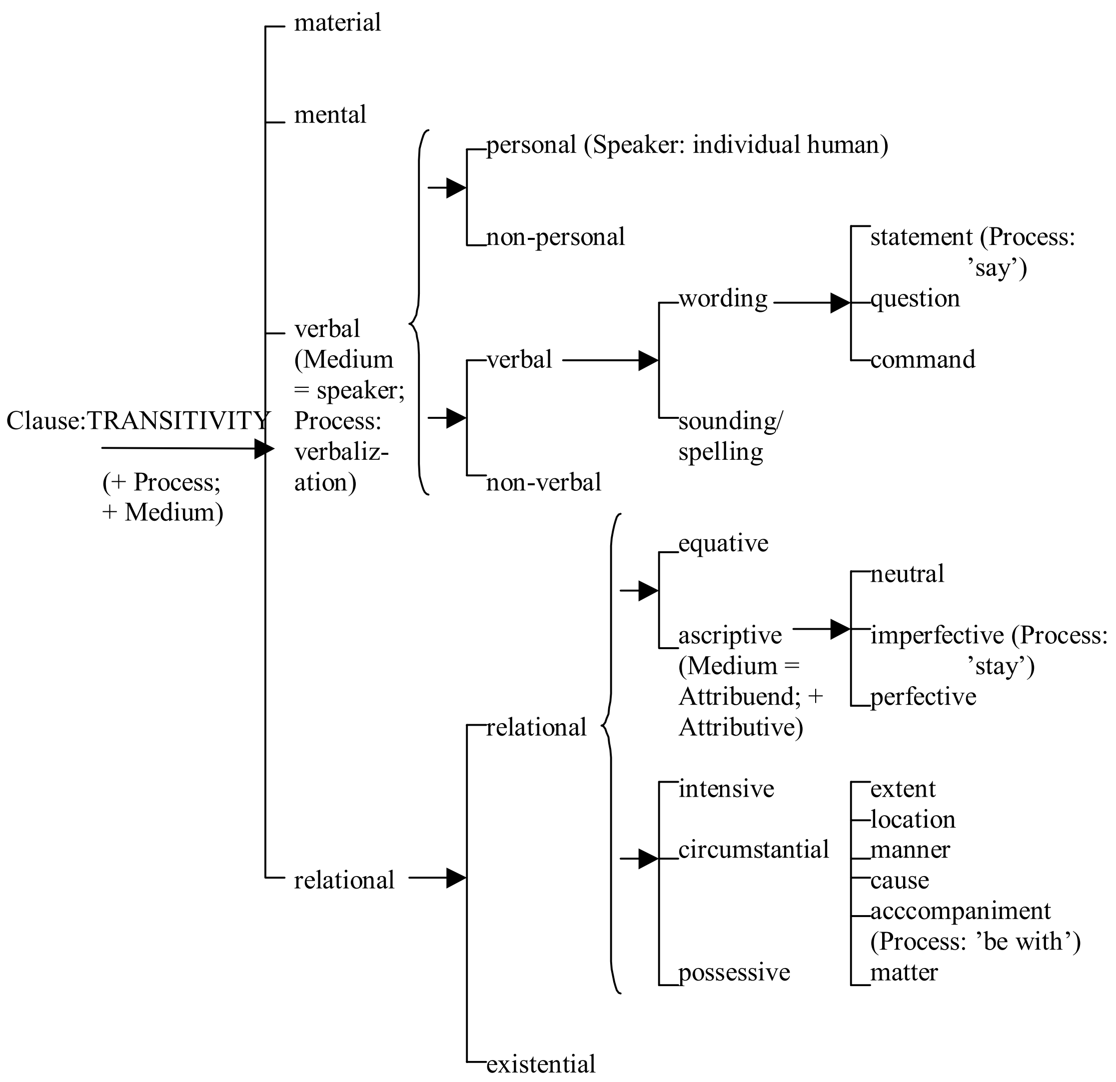

Figure 3.7 from Halliday, 1977:211

One interesting feature of this network is that it includes a new Process type, not encountered before – that of 'verbal' Processes. Through this subsystem a level of delicacy is reached that indicates the generation of the lexical verb. Thus, if [verbal process] is chosen, and this is followed through, making the relevant choices to reach 'statement', the network indicates here that the eventual lexical verb might be '*say*'. And Halliday demonstrates how vocabulary is 'most delicate grammar' by stating that 'lexical items appear as one form of the realization of systemic options, typically as the last step in subcategorization.' (1977:223).

The Process type 'relational' is given its fullest treatment so far in this 1977 system, presented in Figure 3.7. Up to this point 'relational' Processes have led to the choice of 'equative' or 'attributive'. In this network, 'relational' leads on to the possibility of 15 further semantically based choices. However, in this paper no further explanation of these choices is given, and so for now we must infer the significance of these choices from the terminology used. This suggests a further reason to use semantically based labels for features in the network, and in this paper Halliday's system networks certainly seem to be moving in this direction.

Halliday has posited the idea several times that in language semantics and grammar are set on one continuum, and therefore, as he states later in Halliday (1985:xix), 'a functional grammar is one that is pushed in the direction of semantics'. I believe that in the writings that have been assessed so far, this is exactly what the development of the system for TRANSITIVITY has been doing – moving in the direction of the semantics.

3.1.13 Fawcett 1980, Cognitive Linguistics and Social Interaction

Having discussed in detail the treatment of TRANSITIVITY in SFL over a span of nearly 20 years, and noted two 'branch theories', it is now time to turn to a proposal that was to develop into the major alternative to Halliday's model of SFG. This is Fawcett's first detailed description of his alternative approach and thus his first detailed description of TRANSITIVITY. Although we have met the first assertion of this in his 1973/81 paper, here we find a fuller presentation.

Unlike Halliday, Fawcett does not group 'experiential' and 'logical' together, but refers to them as two separate functions in his classification of eight main strands of meaning. He classifies the 'experiential component' (that which includes TRANSITIVITY) as expressing 'the meanings through which a language reflects the objects, qualities, and relationships that a person finds in the world around him' (1980:134).

If we consider Halliday's first clear statement on TRANSITIVITY - 'The transitivity systems are concerned with the type of process expressed in the clause, with the participants in this process, animate and inanimate, and with various attributes and circumstances of the process and the participant' (Halliday, 1967:38) – we can detect that Fawcett and Halliday have a very similar starting position, except that Fawcett makes no mention of Circumstances at this point.

In his description of TRANSITIVITY, Fawcett uses Halliday's terminology in referring to the 'inherent roles'. However, his reasons for using this term are different to Halliday and, further, there are some major differences in Fawcett's application of the term 'inherent roles'.

Fawcett does not use the term 'inherent' here to indicate Halliday's differentiation between 'Participant' and 'Circumstantial' Roles. Fawcett draws the line between the two at a different point. Fawcett's 'Inherent Roles' include both what Halliday terms 'Participant Role' and Halliday's 'Inner Circumstances' of the clause. The latter are – for Halliday – are Circumstances that are inherently associated with certain Process types, as in example (1):

(1) They threw the stones *at the bridge*.

For Fawcett, however, this role would be not a Circumstance but an Inherent Role of the Process.

Furthermore, Fawcett's system networks do not generate functions as an intermediate stage in the structure, as Halliday's (and also Berry's (1975)) do.

To illustrate, Berry (1975:77) seems to suggest that the roles come intermediately, with 'functions' (as she recognizes them) coming between networks of meaning options and form. She shows this diagramatically on a continuum:

← terms from systems → functions → structures → formal items →

Berry makes this explicit by stating that 'each element of structure has certain **functions** associated with it. The element S [subject], for instance, usually has the function of expressing the **actor** of an action' (Berry, 1975:77).

At this point it will be useful to examine a version of his system network for TRANSITIVITY, as presented in Figure 3.8, to demonstrate exactly how for Fawcett the roles are features in the system.

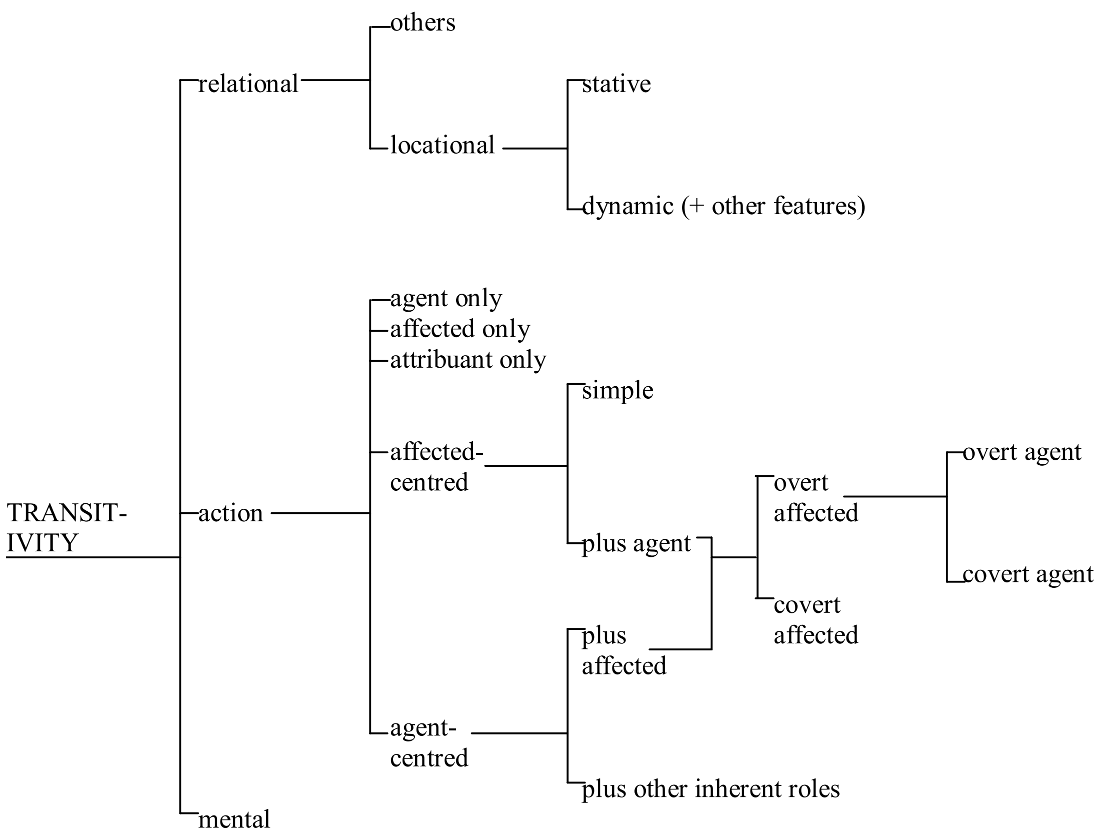

Figure 3.8 from Fawcett, 1980:137

According to Fawcett (1980:136), Inherent Roles are not directly part of the grammar, but 'phenomena that are referred to in the features that are selected for a referent situation' (Fawcett 1980:136). However, this was a temporary position and in his later work PRs have a place in the structure of the clause that is as well established as concepts such as 'Subject'. In any case, we can see that the roles are important for defining the Process type, as his network shows, with the detailed description of the system for 'action' Processes being defined by the roles chosen in the network. The question of whether the roles are at the level of grammar or of meaning seems to arise from Halliday's addition of a 'socio-semantic' level, with the concepts of 'subject' and 'agent' being considered at the same level as each other, i.e. the lower level of the lexicogrammar.

Fawcett discusses what the network should be concerned with, and his conclusions are as follows:

1. The network is to generate a ‘selection expression’, which specifies the Process type. Thus, the Process type generated by the network will produce an Inherent Role configuration, ‘including a specification of whether they will be realized ‘overtly’ or ‘covertly’, and so whether or not an Inherent Role will be realized in items at the level of form.’ (Fawcett, 1980:136).
2. The entry conditions to other system networks.
3. Associated lexical verbs that are produced as a result of the Process type classifications and the Inherent Role configurations.

Note that this differs greatly from a view of TRANSITIVITY that is concerned merely with what kind of Complement a Process will take, i.e. ‘intensive’ or ‘extensive’. Fawcett views TRANSITIVITY as belonging fundamentally at the level of semantics.

The further major difference from other descriptions of TRANSITIVITY found in Fawcett’s description is in the terminology for role types. Instead of ‘actor’ and ‘goal’, Fawcett prefers ‘agent’ and ‘affected’. A clause which demonstrates this is (2):

(2) The ball bounced.

Fawcett’s analysis classes *the ball* as an ‘affected’, and not ‘goal’, as he points out that the use of the term ‘goal’ implies the involvement of an ‘actor’. This suggests, if we consider once again Halliday’s 1968 descriptions of ergativity (see Section 3.1.6), that the Fawcettian approach to TRANSITIVITY is essentially ergative, in its recognition of ‘affected’ entities as being evident in most Process types.

With regard to Fawcett’s treatment of the Process types, at this point he still uses Halliday’s original term ‘action’, whereas Halliday has by this time changed to using the term ‘material’. Fawcett’s reason for this is that not all ‘actions’ are ‘material’, and therefore it is not a useful term. The verbs *marry* and *attack* are given as examples of ‘non-material actions’. We shall return to this point in Chapter 5, in the presentation of Fawcett (in forthcoming a).

Fawcett’s classifies ‘mental’ Processes into the following sub-categories; ‘emotion’ (Halliday’s 1968 ‘reaction’); ‘perception’; ‘cognition’; and 'communication' (Halliday's 'verbal', 1968). I will not provide any further description of Fawcett's 'mental' Processes here, but will consider them in Chapter 5.

The 'relational' Processes include 'equative', (which relates to Halliday's equative process above); 'classificatory', 'associative', and 'locational'. The description of 'relational' types is very brief in this description, and it is more useful to consult Fawcett, 1987 for full assessment of the 'relational' Process types (which is also discussed in Chapter 5 below).

The next aspect of Fawcett's discussion of TRANSITIVITY to be considered is his labelling of terms in a network. He suggests that labels that suggest the meaning of the feature are more useful than Halliday's labels such as 'effective' and 'operative'. For example, the meaning of the transitive/ergative distinction discussed above is made more 'transparent' by Fawcett as 'affected centred' Process and 'agent centred' Process.

Further to this, Fawcett points out that in suggesting that English TRANSITIVITY has changed from transitive to ergative, it is a little meaningless for Halliday to maintain the transitive patterning by the use of the (essentially 'transitive') terms, 'actor' and 'goal'. Fawcett claims that what might at first appear to be 'affected-oriented' terms for the roles ('agent' and 'affected') are in fact suitable for both ergative and transitive patterning, and in my view he is justified in this. Despite the fact that (as was recognized in section 3.6) Halliday uses the term 'affected' to help define cases of ergativity, the labelling that Fawcett uses is equally useful in the analysis of transitive examples.

Another important aspect of Fawcett's approach is that he has not only moved away from the transitive/ergative labelling, but he has also moved away from using 'middle' as a label. Instead he introduces the features of 'one-role Processes' and 'two-role Processes'. In using these labels Fawcett is able to introduce a further semantic distinction between 'agent only' Processes, and 'affected only' Processes.

It is important to mention that many further developments of the Cardiff Grammar beyond this point in 1980 have taken place. A full and detailed description of the theory as it currently stands will be presented in later chapters, as reasons of space mean that this chapter must be limited in some ways. Being the framework within which the present thesis is based, an important evaluation of the Cardiff Grammar theory will take place in full in Chapters 4 and 5.

3.1.14 Halliday (1985/94), Introduction to Functional Grammar

In Halliday's *Introduction to Functional Grammar* (1985/94; henceforth IFG) we find the most detailed description of the theory, although it does lack any networks to model the meaning potential. Nevertheless, this brings the present chapter to the point where we can consolidate our examination of Halliday's work so far. Halliday's treatment of TRANSITIVITY has been discussed as the main network in the ideational metafunction, and as being the system through which situations, Processes and Participants are constructed. This chapter has so far seen the evolution of the system in Systemic Functional terms, and the move towards generating structures at the level of form from semantic choices.

In IFG Halliday's treatment of TRANSITIVITY is somewhat – though not radically – changed from the various 'snapshots' given above. Most of the main concepts remain but with some alterations.

Firstly, and most obviously, the major Process types, of 'action' – which is from this publication onwards referred to by Halliday as 'material' – 'relational' and 'mental', are brought out much more explicitly in this later description. Secondly however, in this publication we find the inclusion of two further main types, namely 'behavioural' Processes and 'existential' Processes, with 'verbal' Processes having been introduced in 1977.

It will be useful to recapture what has already been made explicit by Halliday about the different Process types in order to assess what new aspects are introduced in this publication. In his descriptions so far 'action'/'material' Process types have always been central and it is for this reason perhaps that they are those about which most detail is provided. Halliday states that 'material' Processes are of a 'doing' type, and can be tested by asking 'what did it do?' or 'what happened to it?'. 'Material' Processes, as we have seen, have the functions of 'actor' and 'goal' associated with them.

With regard to 'mental' Processes, Halliday states the reasons for considering these as a separate Process type. The main reasons are firstly that the Process requires a conscious Participant, i.e. a Participant that is endowed with conscious properties. This is not the case for 'material' Processes. Secondly, 'mental' Processes typically take the simple present tense, where 'material' Processes typically take the present continuous tense. He explains that a reason for this is that the two tense types convey different meanings. He states that the present continuous, or 'the "present in present" is more focused in time; hence it occurs with Processes that have clear beginnings and endings, as is typical with 'material' Processes. 'Mental' Processes, which are in general not clearly bounded in time, are associated with the less focused tense form, the simple tense.' (IFG:116). Thirdly, and importantly from the viewpoint of semantics, he distinguishes 'mental' Processes as they are not Processes of 'doing'. Therefore, the roles of 'actor' and 'goal' are abandoned in favour of the functions 'senser' – the Participant who 'senses', and 'phenomenon' – the Participant that is 'sensed'.

Finally, he recognizes further major semantic subclassifications of 'mental' Processes, i.e. features rather than names of networks, e.g. 'perception', 'affection' and 'cognition'.

Halliday's presentation of 'relational' Processes is somewhat changed in this description. One approach to them was presented in a system network in Halliday 1977 (Section 3.12 above), but in IFG there is a different and more detailed account. Perhaps the most useful explanation of the functioning of Processes of the 'relational' type can be deduced from the following table that Halliday presents:

	(i) attributive	(ii) identifying
1) intensive	Sarah is wise	Tom is the leader; The leader is Tom
2) circumstantial	The fair is on Tuesday	Tomorrow is the 10th; The 10th is tomorrow
3) possessive	Peter has a piano	The piano is Peter's; Peter's is the piano

Table 3.2 'The principal types of relational process' (from Halliday, 1994:113)

As this table shows, three main types of 'relational' Process are identified: 1.'intensive' ('x is a'), 2. 'circumstantial' ('x' is at a'), and 3. 'possessive' ('x has a'). Furthermore, each type is cross-classified with two other types of meaning; either 'attributive' or 'identifying'.

Interestingly, Halliday presents the options for ‘relational’ Processes in a manner which could easily be recognized as a system network, the pattern of the sections on pages 120 – 138 (1994) being as follows:

- intensive
  - attributive
  - identifying
- circumstantial
  - attributive
    - circumstance as attribute
    - circumstance as process
  - identifying
    - circumstance as participant
    - circumstance as process
- possessive
  - attributive
    - possession as participant
    - possession as process
      - (one) possessor as Carrier
      - (two) possessed as Carrier
  - identifying
    - possession as participant
    - possession as process.

Figure 3.10 The potential system network for Relational Processes as they are presented in Halliday (1994:121 – 138)

However, Halliday surprisingly makes no mention of the use of system networks in this publication.

Halliday states that the three other Process types – ‘verbal’ Processes (first recognized in Halliday 1977), and the two new types of ‘behavioural’ and ‘existential’ – are, in fact, ‘subsidiary’ Process types.

The ‘behavioural’ Processes are described as relating to physiological and psychological behaviour - Processes such as ‘breathing; coughing; smiling; dreaming; and staring.’ (1985:128). This Process type is borderline between ‘material’ and ‘mental’ Process. The Participant that is ‘behaving’ is assigned the role ‘behaver’. Halliday compares this role with the ‘senser’ in a ‘mental’ Process. However, in my view the Process is grammatically more similar to ‘doing’, and thus ‘material’. These

Process types seem to be Processes of 'action', and furthermore, 'action' that typically occurs with one Participant only, as we shall see in Chapter 5.

The 'verbal' Process type relates to 'any kind of symbolic exchange of meaning' (1985:129), as in example (1):

(1) What did you say : I said it's noisy in here

Interestingly, Halliday indicates that this Process does not require a conscious Participant. It is possible to have a Participant as 'a watch', as in example (2).

(2) My watch says its ten o'clock.

In examples such as this the Participant typically expected – or most 'probable'[28] – at this place would be an animate being, and typically human. However, this case is not unique, and there are many places in the transitivity of English where language enables us to 'metaphorise' a Process type, and so to include non-conscious Participants[29]. The PR assigned by Halliday to this Process type is 'Sayer'. Three other possible Participants are suggested as being able to occur with this Process type: 'receiver' being the person 'to whom the verbalization is addressed'; 'verbiage' being what is said; and 'target' being the target of 'verbs such as *insult, praise, slander, abuse, flatter'* (1994:141).

The 'existential' Process type is the representation of something that exists or happens, as in example (3):

(3) There was a little guinea pig.

In the case of this Process type, the Subject *there* 'has no representational function'. Typically, this Process type will take the verb 'be', and in this way is similar to a 'relational' Process type. Also, this type of clause will often contain a distinct Circumstantial element. In the Cardiff Grammar, Halliday's 'existential'

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[28] See Chapter 4 for a more detailed account of the notion of probability in SFL.

[29] The concept of, and treatment of, metaphorical TRANSITIVITY is discussed in Chapter 7.

Process is recognized as a ‘relational’ Process of **location** involving an ‘empty Subject’, which is an example of an **existential theme construction** (Fawcett, forthcoming a, Section 3.4.2), and in an example such as (3), the location would be considered to be covert. ‘Locational’ Processes will be described further in Chapter 5.

Halliday states that the ‘existential’ Process type also includes the special category of ‘meteorological’ Processes (IFG:143), where the Subject also involves a non-referential Subject, as in example (4).

(4) It’s raining.

In the Cardiff Grammar this Process type is labelled ‘environmental’. Both Halliday and Fawcett recognize that this clause is unique in that it involves no PR – ‘these clauses can be analyzed as consisting of a single element’ (1994:144).

Halliday’s description of TRANSITIVITY in IFG then proceeds to discuss other Participants that are typically expected by the Process types. This includes the Participants discussed in the 1967/8 papers, above.

Perhaps the most interesting aspect of his IFG description is the discussion of the existence of the ‘ergative’ perspective alongside the transitive perspective discussed so far. In the ‘ergative’ perspective he foregrounds the view that all processes are structured in the same way, on the basis of one variable, and in this view English is essentially ergative and not transitive. Halliday states that ‘the variable is not one of extension, but one of causation. Some Participant is engaged in a Process; is the Process brought about by that Participant or some other entity?’ (1985:145).

This concept of not recognizing the traditionally ‘transitive/intransitive’ distinction, but one of ‘ergativity’ was first presented by Halliday in 1968 (as described in Section 3.1.6 above) and then in Halliday (1970) (Section 3.1.7), and the new emphasis in IFG is on the centrality of the roles of ‘Medium’ and ‘Agent’ in ergative constructions.

As described in Section 3.1.11, Fawcett (1980) considered the ergative perspective, where he proposed a system network for TRANSITIVITY which enabled the generation of the transitive and the ergative not as separate constructions but using the same system network criteria for both clause types.

The notion central to Halliday's IFG description is one of 'cause and effect'. This is described in terms of the notion that every process has one Participant, and that this Participant is the 'Medium' through which the 'Process' is actualized – that is, in all processes except those in the 'mediopassive voice', as in example (5).

(5) The bed hadn't been slept in. (Halliday, 1994:169).

Halliday suggests that the Process and the Medium 'together form the nucleus of an English clause; and this nucleus then determines the range of options that are available to the rest of the clause' (1994:164).

The Medium functions as a PR in the clause, and it functions differently according to the Process:

'The ergative function Medium is equivalent to:

in material process	to Actor (middle), Goal (effective)
in behavioural process	to Behaver
in mental process	to Senser
in verbal process	to Sayer (middle), Target (effective)
in attributive process	to Carrier
in identifying process	to Identified
in existential process	to Existent'

(Halliday, 1994: 165)

Thus, he states that 'the Medium is the nodal Participant throughout: not the doer, or the causer, but the one that is critically involved' (1985:147).

In conclusion, Halliday's discussion of TRANSITIVITY in IFG consolidates the views explored in earlier discussions on TRANSITIVITY. It concludes the developments of Halliday's influential work on TRANSITIVITY in the framework of SFL over nearly quarter of a century. Next we shall consider the related work by other scholars who use what has been described up to this point as its basis.

3.2 More recent developments in TRANSITIVITY in the SF framework

Having considered over thirty years of the development of the description of TRANSITIVTY in SFG, this chapter now consider more extensions, enhancements and applications of the theory. This half of the chapter will look at the early formulations of system networks by Berry (1977) and Fawcett (1980). It will then present Hasan's (1987) proposals for creating a fully delicate TRANSITIVITY system network for a small number of Processes. The next section will consider Davidse's (1991, 1992 and Davidse and Geyskens 1998) treatment of TRANSITIVITY, and her proposals for modeling 'ergativity'. And finally, the chapter will present Matthiessen's (1995) framework for the TRANSITIVITY system network, which is essentially an augmentation of Halliday's discussion in IFG.

3.2.1 Berry's (1977) and Fawcett's (1980) early networks for 'lexical delicacy'

Whilst the works that I have examined in this chapter have been concerned with the initial systems for TRANSITIVITY, the papers that I will consider next attempt to extend the system networks towards a deeper level of delicacy. In Section 3.1.3 we considered Halliday's proposals for a single system for language generation, and a unified 'lexicogrammar'. According to Tucker (1998:14), Berry's (1977) introductory SFL text, 'constitutes the first published attempt to implement Halliday's "most delicate grammar" approach to lexis by setting out a system network which represents the meaning distinctions which are carried by individual lexical items'.

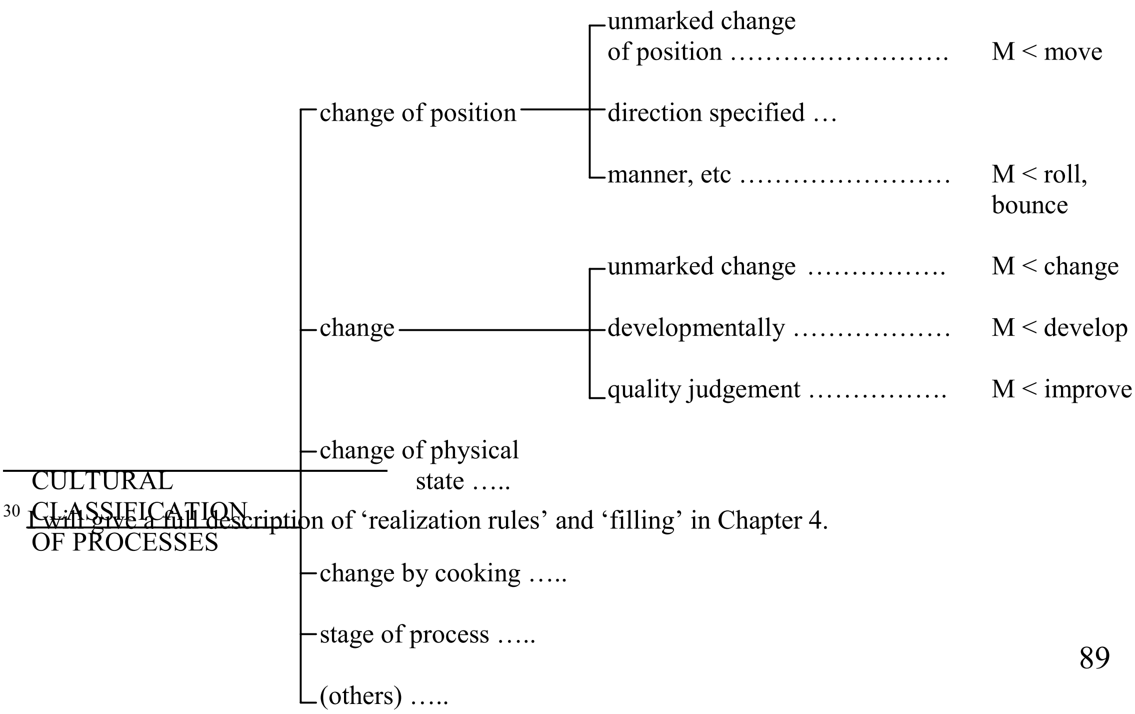
The system network that Berry proposes is for the choice of 'animal type', and, as Tucker (1998) points out, what is interesting about her network is that, rather than being a means for modelling lexis as part of the lexicogrammar, it is more a system for the subcategorization of a phenomenon through semantic relations. The initial systems are parallel systems, with the system of ANIMALHOOD being choice between [human] and [non-human], and the system of MATURITY being choice between [adult] and [youthful]. Thus these choices are based on a semantic 'polarity' – i.e. they are antonyms. The more delicate choices are hyponymic, where choices of [non-human] plus [tame] plus [domestic] lead to a 'type of' relation, with choice between [feline], [canine], etc.

While Berry's network demonstrates how it is possible to reach lexis through delicate choices in a network – in this case, by semantic subclassification – what it does not demonstrate is how grammar and lexis can come together in a unified network. Tucker highlights the fact that Berry, at this stage, is not necessarily striving towards this goal, and that, moreover, she sees the two as being related on a cline, rather than with lexis being ‘subsumed under grammar’ (Berry, cited in Tucker, 1998:15).

Fawcett (1980), however, does attempt to model a unified system. We saw in Section 3.1.13 how he models the TRANSITIVITY component of the grammar, i.e. the choice of Process type and PR configuration. He also allows for the TRANSITIVITY system network to join with the system network for CULTURAL CLASSIFICATION, as we saw in Section 3.1.11. This system specifies the lexis, and is motivated by choices leading to lexical item.

The CULTURAL CLASSIFICATION system is thus called because, as Fawcett states, ‘the performer matches his referents with the ‘concepts’ stored in his general, long term knowledge of the universe’ (1980:134), and these concepts are recognized lexically through a system such as that presented in Figure 3.11. This network shows not only how the lexical items are generated in the system, but also how **realization rules** are used for specifying that a particular lexical item with ‘fill’ the Main verb in the structure being generated[30].

Tucker (1998:16) states that ‘Cultural Classification is modelled as the more delicate part of relevant sub-networks, and (Fawcett) gives examples of networks for both verbs and nouns’. Our interest is, in particular, the system for lexical verbs:



[30] I will give a full description of ‘realization rules’ and ‘filling’ in Chapter 4.

Figure 3.11 Adapted from Fawcett's 'A very tentative and partial system network and realisation rules for the cultural classification of 'affected-centred' processes in English' (1980:153).

Fawcett points out that this 'Cultural Classification of Processes' system network is very tentative; it is a general overview of how the grammar MIGHT be. Indeed, all of the proposals in Fawcett 1980 are an indication of how things a model of language might be, and it is on this single work that the whole CG is based (Tucker (1998), Fawcett and Tucker (2000), Fawcett (2000a), Fawcett (forthcoming), Ball (forthcoming), and the present thesis).

3.2.2 Hasan's approach to modelling 'lexis as most delicate grammar' (1987)

I shall now consider in some detail Hasan's 1987 paper; 'The Grammarian's Dream: Lexis as Most Delicate Grammar'. In this paper she projects one semantically related aspect of TRANSITIVITY towards its logical conclusion of choices made through a unified network until no more choices can be made. She is concerned with the 'territorial expansion' (Halliday 1961:69) of grammar to the point of the realization of lexis and she creates delicate system networks for a single area of lexis and demonstrates how it is possible to realize 'the grammarian's dream'.

In examining this paper and Hasan's proposed network we can see – at least to some extent – how the extension to 'most delicate grammar' might be accomplished for the whole of the system for TRANSITIVITY. This is of particular interest to the present research, as the results of this research are the extension of the system networks for three Process types. These system networks are described in Chapter 8 and presented in Appendix B.

Hasan's work is based on the model posited in Halliday (1977), and she highlights the fact that she is working from Halliday's maxim that language consists of semantics and lexicogrammar, both of which combine to create a system for choice making which ultimately produces linguistic structure, and she makes some assumptions from this basis, the first two of which are particularly relevant:

> '(1) Language consists of three strata: semantics, lexicogrammar and phonology. (2) These strata are related by 'realization': meanings are coded as wordings, wordings are coded as sound patterns. (3) Each stratum is describable as a network of options; the description is, therefore, paradigmatic, with environments for options also being defined paradigmatically' (Hasan, 1987:184).

Hasan (1987) takes this view of language as her basis, and so we can detect from early on in the paper that semantic delicacy is paramount to her 'lexis as most delicate grammar'.

Hasan is concerned with a particular small group of semantically related lexical verbs, which are subsumed under the heading 'disposal'. She recognizes these Processes to be subcategories of the Process type 'action'. The notion of subcategorisation is key to her technique for the extension of a network, with the 'subcategorisation' of features enabling more and more delicate semantic distinctions to be made. Hasan states that her sub-categorisation 'should not be confused with Chomsky's selection restriction rules (1965)' (Hasan, 1987:188). However, she does not define clearly what her sub-categorisation involves. In my view her sense of subcategorisation is like this: 'subcategorise by choosing these features from a network of possibilities' (see below for examples).

In producing delicate networks, Hasan's starting point in the system for TRANSITIVITY is [action] Process types[31], through which she pursues a path to reach [disposal] Processes, which then leads to the choice of [acquisition] or [deprivation], and it is the extension of these two networks with which she is concerned. This is presented in Figure 3.12.

[31] It is interesting that her starting point is [action], rather than [material] which would be in keeping with the Hallidayan TRANSITIVITY system. Having [action] as the entry condition for the network is the same as it is in the Cardiff Grammar system for TRANSITIVITY.

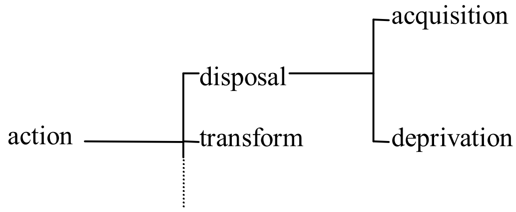


Figure 3.12 The initial section of Hasan's network for 'disposal'

On reaching the feature 'acquisition', the 'realization statement' is as follows:

> 'subcategorise Event as /(material action of disposal involving change in location of Medium) leading to Agent's gain of access to Medium/'. (Hasan 1987:190)

This realization statement provides the specification for Processes through which some kind of 'gain or loss of access to things' (1987:187) is accomplished. She also includes further realization statements of 'subcategorize Medium Thing as /alienable object/' and 'subcategorize Agent Thing as /human, person(s) or institutions/' (1987:188). However, she then introduces examples of clauses that contain the 'acquisition' Process of 'collect' in which these realization statements are not met. For example, Hasan states that in (1), *her thoughts* is not an 'alienable object'.

(1) She collected her thoughts.

This seems to be a case of meaning extension to the domain of metaphor with *her thoughts* being objectified and thus able to function at the typical place of 'thing'. (She does not, at this point further specify the Participant Role types).

I find it natural that there should be cases where the Participant is 'metaphorised', with (1) being a typical example in which an abstract concept, (here 'a thought') is 'objectified', and associated with a 'material' Process for ease of description.

However, she argues that, in this case of 'complex metaphor' (1987:188), what would normally be classed as the 'medium' does not function as 'medium'.

Typically, for instance, in example (2), *a lot of leaves* are easily recognisable as the 'medium':

(2) She collected a lot of leaves.

However, Hasan proposes that in the case of (1), the objectified role of *her thoughts* is not the 'medium', but '*collect + … thoughts* must be seen as a unit' (1987:188). It seems to me that in creating a delicate system network, this example of 'collecting' is still a Process of 'acquisition', and in fact the section of the network in which choices are made for Participant Role type should provide for occurrences such as *her thoughts* occurring in the clause.[32]

Her system for Processes of 'acquisition' leads to the subcategories of not just 'collect', but also 'gather' and 'accumulate' and the eventual realization of them as lexical items. We shall now consider more of the system to discover how Hasan defines the delicate properties of these items to enable the modelling of their semantic differences as a system of choices between each.

[32] In the Cardiff Grammar this would be the case. See Chapters 4 and 5 below for how the network for TRANSITIVITY handles the areas of PROCESS TYPE and PARTICIPANT ROLES.

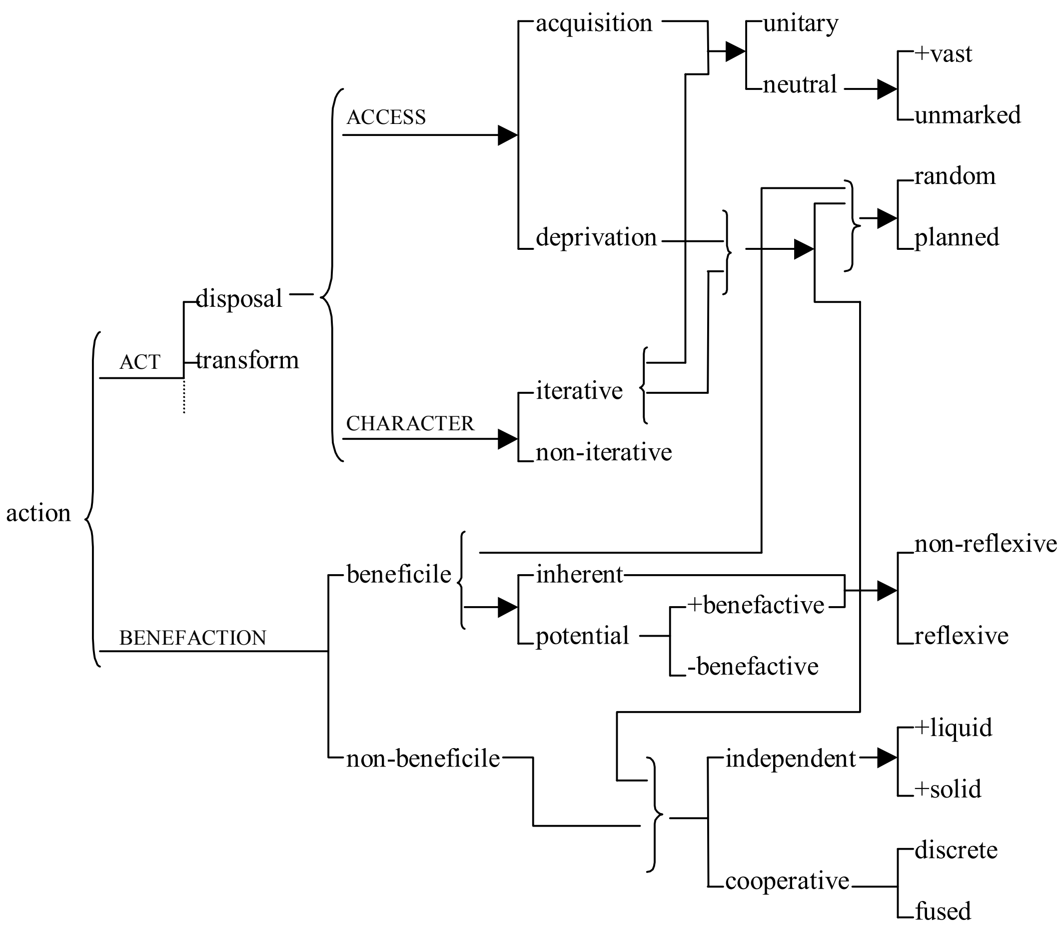


Figure 3.13 The Process type [disposal:iterative], Hasan, 1987:189

Hasan's description of this system begins with how [disposal] Processes can be generated. She introduces the use of three further systems which must be considered for further specification of a lexical item to be reached through the [disposal] network. These systems are [access], [character] and [benefaction].

The systems [access] and [character] enable further semantic specification of the Processes involved in [disposal], and are also dependent on the choice [disposal] being made. 'Access' is concerned with whether the 'activity', or Process, leads to the [acquisition] or [deprivation] of the Medium. 'Character' is concerned with 'the nature of the activity', and leads to the choice of the activity being either 'iterative' or 'non-iterative' – that is, a repetitive activity or a non-repetitive activity.

'Benefaction' is a larger system to be considered, and this classification comes from the Hallidayan TRANSITIVITY classification, in which the Circumstantial Role of 'Beneficiary' is recognized. As can be seen in Figure 3.13, the immediate choice on entering this 'benefaction' network is of [beneficile] or [non-beneficile], and if [beneficile] is chosen then the benefiting party might be 'inherent' or 'potential'. This choice indicates the occurrence of two different types of role in a particular Process – one that is inherent, and thus a Participant Role, and one that has potential for occurrence, but is not inherent, and is thus a Circumstance in the Process. For example, the difference between 'giving' which has three inherent roles (as in example (3)) and 'buying' which has two inherent roles, but can take an optional Circumstance (as in example (4)).

(3) She gave him a present.
(4) She bought (him) a present.

In this network, 'benefaction' specifies the Participant Role type. While it is useful for Processes such as the type with which she is concerned, it is not necessarily useful for other 'action' Processes that would not involve a Beneficiary. In the Cardiff Grammar this area of Process type is 'subclassified' (to use Hasan's term) as 'relational' Processes of 'possession', and Hasan's distinction between 'inherent' and 'potential' seems to correspond to what we have seen Fawcett (1980) modelling as Processes involving either three inherent roles or two roles plus a Circumstance.

Hasan suggests that the 'PI' – the summary of choices made to reach a point in the system, which Halliday and others refer to as a 'selection expression' – for the three Processes of 'collect', 'gather' and 'accumulate' is;

material: action: disposal: acquisition: iterative

It is at this point in the network that specifications are made for the 'most delicate' semantic distinctions for the three Processes.

The network then goes on to enable very fine distinctions to be recognised between the three verbs, which are very closely semantically related. On choosing [iterative], the next choice to be made in the network, as shown in Figure 3.13, is between [unitary] and [neutral]. The choice of [unitary] will lead to the generation of a 'Medium (that) is constrained to be "plural". In English the only linguistic form that can meet all these requirements is **gather**' (Hasan 1987:194). And the choice of 'neutral' will lead to a further system of choice between [+ vast] which will semantically define and therefore generate the item ‘accumulate’, and [unmarked] which will generate the item ‘collect’.

Through this section of the system it is possible to determine exactly how a lexical item’s semantic properties can be framed in and generated through a grammatical system.

Hasan 1987 also describes ‘the lexicogrammar for deprivation’, which is also contained within the network shown at Figure 3.8 and which generates the lexical verbs ‘scatter’, ‘divide’, ‘distribute’, ‘strew’, ‘spill’ and ‘share’. However, her description will not be discussed here. The most important concept proposed in this paper is that ‘it upholds the systemic functional view of an uninterrupted continuity between grammar and lexis’ (Hasan 1987:208), and also it indicates how the concept may be actualized. By modelling semantic differences between lexical items in this manner one is ultimately able to model an important aspect of the semantics.

However, I should also indicate that Hasan mentions that one of the limitations of her work is that her network ‘is simply the output of one meta-function – the experiential’ (1987:207), and she states that the choice between examples of synonymously related items such as ‘ask’ / ‘enquire’, and ‘buy’ / ‘purchase’ might be generated through the interpersonal system. I would like to point out that this too can be accounted for in the network through the assignment of rules that specify preferences in the light of ‘register’ features, and which consequently alter probability. This notion will be discussed in later chapters, and indeed its implementation in certain of the networks will be illustrated.

3.2.3 Tucker’s (1998) ‘lexis as most delicate grammar’

I wish to briefly consider Tucker’s (1998) contribution to both the CG and the notion of ‘lexis as most delicate grammar’, as his work is an important advancement in the development of how the Cardiff Grammar generates the lexicogrammar through a system network.

Tucker uses the Cardiff Grammar framework for building system networks, and so his work has the same starting point as the research presented in this thesis, but his focus is on a ‘lexis as most delicate grammar’ approach to adjectives, or, rather, the area of the lexicogrammar that the CG terms QUALITY.

In his 1998 publication, Tucker suggests that other work conducted on areas of lexis in a SF framework have only ever been concerned with ‘modelling fragments of lexicogrammar’ (1998:34). What he is proposing however is that, working within the Cardiff Grammar, it is possible to realize lexis and structure in a ‘single unified system network’, providing for not only the adjectival items themselves, but also the structures that occur around them.

I will say no more about Tucker’s provision for this area of the lexicogrammar, which is separate to the concern of this thesis, other than to state that his proposals enable language generation through a system that does not require a separate lexicon component, but is in fact the realization of ‘lexis as most delicate grammar’.

3.2.4 Davidse’s descriptions of ‘Experiential Grammar’

The next work on TRANSITIVITY in an SFG framework to be considered is Davidse’s approach to ‘Experiential Grammar’ (Davidse 1991 and 1992, Davidse and Geyskens 1998). Davidse takes Halliday’s framework as her basis, but pushes his system network for TRANSITIVITY further. Here, for reasons of space, a full critique of her work on the three main Process types (‘material’, ‘relational’ and ‘mental’) is not possible[33], and so I will concentrate on Davidse 1992, ‘Transitivity/ergativity: the Janus-headed grammar of actions and events’, which, as the title suggests, focuses on the area of ‘material’ Processes and reflects the important distinction between ‘transitive’ and ‘ergative’ constructions.

As we saw in Section 3.1.6, Halliday discusses ‘ergativity’ (which he first discussed in ‘Notes on Transitivity and Theme Part 3’, 1968), and how it relates to the VOICE system. He distinguishes between the systems ‘effective’ and ‘descriptive’, but does not seem to be concerned with how the ‘transitive’ and the ‘ergative’ relate to the configurations of the Participants involved in the Process, as linguists such as Fawcett (1980, 1987) are. Davidse also concentrates on the ‘voice’ distinctions, but for her Process and Participant configuration is the key to producing a description of ‘material’ Processes that is ‘Janus headed’. By recognizing the Process and Participant configuration as key she is able to determine both new TRANSITIVITY

[33] For her treatment of Relational and Mental processes see Davidse 1991.

types and new Participant Roles. She investigates a distinction in the area of ‘material’ Processes between transitive and ergative by exploring how the Participants are configured and she is concerned with ‘the multivariate relations that exist between the elements of structure “process” and “participant”’ (1991:7).

Further to this, she states that she is working ‘at the more delicate “cryptotypical” level’ (1991:20), and so is concerned with the covert grammatical categories that ‘Process type’ might be seen to classify.

The term ‘cryptotype’ was coined by Whorf (1945/56) to describe the grammatical categories that are found in language that are what he calls ‘covert’ categories’. Whorf distinguishes between ‘overt’ and ‘covert’ categories, with the ‘overt’ categories in language being those that ‘have a formal mark which is present in every sentence containing a member of that category’ (1945/56:87). An example of such a category is the marking of plurality of many of the nouns in English with the suffix ‘s’. In contrast, a covert category, or a cryptotype, does not display an overt marker in every occurrence of the cryptotype. The example that Whorf gives of a covert category is that of gender assignment in the English language. He states that ‘each common noun and personal given name belongs to a certain gender class, but a characteristic overt mark appears only when there is occasion to refer to the noun by a personal pronoun in the singular number’ (1945/56:90). To illustrate he states that a person without cultural knowledge of Western European use of English would not be able to know:

> ‘that the names of biological classes themselves are ‘it’; that smaller animals are usually ‘it’; larger animals often ‘he’; dogs, eagles and turkeys usually ‘he’; cats and wrens usually ‘she’; body parts and the whole botanical world ‘it’; countries and states as fictive persons ‘she’ … etc’ (1945/56:90).

Further, Whorf describes that the ‘covert’ markers which identify these cryptotypes are ‘reactances’. And so, the ‘reactance’ for the cryptotype of English gender is the use of personal pronoun.

Davidse recognizes the occurrence of these covert categories in language. She sees Halliday’s TRANSITIVITY categories as cryptotypical (1991:15), and she asserts that the means for identifying TRANSITIVITY is through ‘reactances’, which make it possible for one to reach the covert categories such as Halliday’s that are 'there' in the grammar. The reactances she recognizes for reaching TRANSITIVITY categories are the configurations of Participant Roles.

This use of Process and Participant configuration at some cryptotypical level of the grammar is similar to the way in which Fawcett (1980) models different 'material' Process types as 'agent-centred' Processes and 'affected-centred' Processes. As we shall see, this concept is very relevant to Davidse's argument. Essentially, this distinction enables the modelling of causation and non-causation of the Process, and for Davidse this idea of 'centre-ing' is pivotal in her description. The main thrust of her description is that the 'transitive' is 'Actor-centred' and the 'ergative' is 'Medium-centred' (1991:27), and both can be either Middle (one Participant) or Effective (two Participants). The similarities of Davidse's work to Fawcett's earlier framework for TRANSITIVITY in Fawcett (1980) are consequently very relevant to my research. These similarities are striking and will be further discussed in Chapter 5, where I shall make the case for abandoning Fawcett's distinction between 'agent-centred' and 'affected-centred' Processes.

The present discussion of Davidse's work will firstly detail the phenomena that she is describing. She presents the differences between the 'transitive' and the 'ergative' in terms of how they function in the grammar. In this description I will consider how she distinguishes transitivity and ergativity in terms of their functioning as 'effective' constructions and as 'middle' constructions, and also as 'pseudo-effective' constructions. 'Pseudo-effective' are a new type of structure that she recognizes, and we will determine below what construction type she uses this term to describe.

In line with Halliday 1968, Davidse recognizes the 'transitive' to be a construction involving a 'deed' and a possible 'extension'. The transitive is realized by an Actor who performs the deed, and a possible Goal to whom the deed might be extended. The ergative construction, she states, realizes the 'Instigation of Process' (1992:109), with the role of 'Medium' being crucially involved, but with the potentiality for a further role that she classes as 'Instigator': the Participant that might INSTIGATE the process. Figure 3.14 presents her system network for the transitive and the ergative, and we shall see in the description below how she considers these features to be realized.

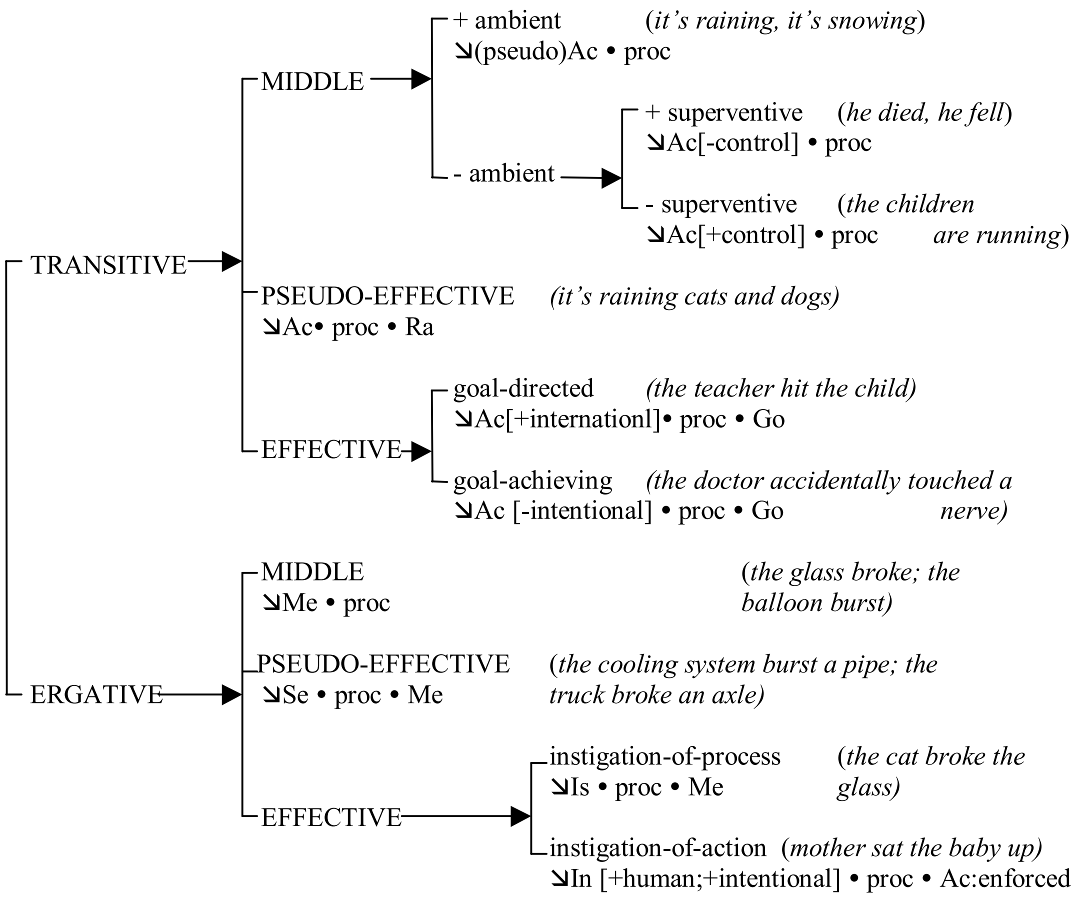


Figure 3.14 Davidse's 'Material processes: primary experiential systems' (1992:130)

3.2.4.1 Effective structures

We will firstly consider her description of [transitive:effective] constructions, (those which are transitive and involve two Participants), whose semantic function she recognizes to involve the notion of intentionality. She describes this construction type as functioning in three possible ways. The first two are dependent on the choice of [conscious], and are [deliberate], as in example (1), and [accidental], as in example (2) and the third realization is [inanimate] as in (3):

(1) The teacher hit the child.

(2) John accidentally hit Mary in the face.

(3) The arrow hit the target.

Interestingly, however, these three construction types are not features in her 'material' Process system network, as shown in Figure 3.10.

Davidse describes a reactance which provides evidence for the transitive/ergative split through the notion of transitive intentionality. This reactance concerns the 'absolute construction' of intentional transitive clauses, for example the absolute construction of (4) and (4a).

(4) The teacher hit the child.

(4a) The teacher hit.

Davidse notes that this is particular to transitive structures because it is not possible for an absolute construction to function in the same way for an ergative example such as (5) and (5a).

(5) John broke the glass.

(5a) John broke.

The Subject in such an ergative example is interpreted as the Affected entity in the Process of 'breaking'. And it is for this reason that she recognizes that the split is due to the 'agent centred' nature of transitives and the 'affected centred' nature of ergatives.

It is interesting to compare Davide's approach with the way in which the Cardiff Grammar generates an 'absolute'[34] construction using probabilities for **covertness** of a Participant Role. In the Cardiff Grammar this distinction is modelled in terms of probabilities and so the split that Davidse describes is indicated in an alternative form, because there must also be provision for covertness of roles in 'ergative' constructions, e.g. the ergative Process of drying in example (6):

(6) You wash and I'll dry (the dishes).

[34] Although in the Cardiff Grammar 'absolute construction' will not be used to describe such a construction.

An example of an ergative Process is ‘demolish’, which is inherently agentive, or in Davidse’s terms ‘instigated’, and so the middle construction in Example (7) is not possible. However, the low probability example in (8) might occur, and this is what Davidse would class as an absolute construction.

(7) *The building demolished.
(8) John demolished for a living.

By modelling the distinction in terms of probabilities of covertness of roles, the reactance that Davidse recognizes is adequately provided for in the CG. Further, this provision enables the generation of covert roles in any construction.

We shall now turn to the contrasting construction that Davidse considers; the [ergative:effective] clauses. She suggests that ergative constructions involving the Participant ‘Instigator’ are not normally intentional, and she states that ‘the performance of a DEED is typically deliberate, but not the INSTIGATION of the event.’ (1992:115). This is illustrated by reference to nominalized *the fact that …* groups. Such nominal groups can function in the role of Instigator, as in example (9), but such a nominalization does not work in the Actor slot in a transitive construction such as example (10):

(9) the fact that boiling water was poured into it broke the glass
(10) *the fact that he aimed hit the target.

What Davidse’s descriptions show is that the transitive construction is, ‘actor-centred’ with transitive examples such as (4) involving the ‘actor-centred’ Process of *hitting*. As stated above however, Davidse recognizes that the ergative construction is ‘medium-centred’, and thus examples such as (7a) (as an attempt at providing a single Participant alternation of (7) in the same way as (4a)) cannot be related to an event where *John* is the Medium, because we try to interpret *John* as Actor.

(7a)*John broke.

In the current Cardiff Grammar both of these ergative:effective and the transitive:effective Process types are generated in the 'action' 'two role' Process system. As stated above, this is a change from Fawcett 1980, where the ergative/transitive distinction was clear in the network in the distinction between the agent-centred and the affected-centred system.

3.2.4.2 Middle structures

Davidse discusses the transitive and ergative middle structures by considering the differences of the 'intransitive' and the 'non-ergative'. She uses these labels to contrast with the 'effective' structures. In Cardiff Grammar terms they refer to 'one role' Processes. The main difference between the two is that in the case of the 'intransitive' no agent can be added, as in Example (1), whereas a non-ergative can be 'extended' to include an Instigator, as in Example (2) which can be extended by adding an Actor/Agent, as in (2a).

(1) He died.
(2) The door is opening.
(2a) Who's opening it?

The current version of the Cardiff Grammar does not recognize this split between an intransitive which cannot have an Agent ADDED to it and a non-ergative which can. The position taken in the generation of these types in the CG TRANSITIVITY system is that there are different verb senses – either one or two role – and it is not necessary to generalise between the structures.

3.2.4.3 Pseudo-Effective structures

Davidse recognizes this new area of pseudo-effective constructions to be 'those grammatically rather intriguing two-participant clauses that "look" effective but are not, such as *the thief jumped the wall*' (1992:124).

Examples (1a), (1b) and (1c) are [transitive:pseudo-effectives], or transitive (as opposed to being 'ergative') constructions which involve a Range:

(1a) They danced an energetic jig.

(1b) They drove the whole distance.

(1c) They crossed the field.

Davidse indicates that in her model these are not transitive, but are intransitives with the Range functioning as a Circumstance. However, she also notes that the Range can become the Subject in a passive construction, and that this would typically be, certainly for Halliday (in IFG), the test for defining a role as a Participant in the Process rather than a Circumstance. Therefore she recognizes, like Halliday, that Ranges are not 'true participants', but are somewhere between Participant and Circumstance, and so she concludes that it is a 'pseudo participant' (1992:125).

The case of ergative pseudo-effective structures are more troublesome than the transitive type. She gives (2a), (2b) and (2c) as examples:

(2a) He fractured an arm in the accident.

(2b) The cooling system burst a pipe.

(2c) The car broke an axle.

She states that the second role in each of these examples cannot be passivized, nor does it pass her 'do to' test (**an arm was fractured by him in the accident; *what he did to an arm was fracture it in the accident*). This 'do to' test is a reactance that indicates that the second role is 'affected' by the Process, and is thus an ergative-effective structure. Therefore, failure in this test indicates that the two Participant clauses she suggests are not 'effective', and so must be categorised as 'pseudo-effective'.

Interestingly, it is a test similar to this that Fawcett (in preparation a) uses to detect the roles of Agent and Affected in the clause. To detect whether a role is an Agent, Fawcett applies to the Process the statement 'what x did was to …', and to detect whether a role is an Affected entity in the clause, the statement 'what happened to y was that x …ed him/her'. Fawcett's test is different to Davidse's, however, because the 'do to' test only identifies Affected entities in two role Processes. His preferred tests allow for testing one role Processes as well.

Davidse follows Langacker's classification and calls the first role in her pseudo-effective constructions a 'Setting', which, like the Range, she recognizes as a 'pseudo-participant' (1992:128). This enables her to describe these two-participant clauses, which essentially seem to involve two Affected entities:

	Setting	Process	Medium
(3)	John	broke	his neck
(4)	Peter	grew	a wart

She proposes that while the 'Setting' is a 'pseudo-participant', the 'Medium' is the 'true-participant'. As such, the pseudo-participant, which functions somewhere between Participant and Circumstance, highlights how this construction is ergative, with the Medium being crucially involved.

What must be highlighted in dealing with these constructions is that the participants of *his neck* and *a wart* in (3) and (4) are POSSESSED by the entity *John* or *Peter*, and thus these entities appear to be Affected entities. However, using the CG Participant Role configuration and tests for Participant Role type, it is possible to recognise that these Participants can be generated through the system network as Agents, and they pass the CG test for Agents:

(3a) What John did was break his neck.

Having considered the three main construction types we can say that Davidse's 1992 paper takes the well-established distinction between transitives and ergatives, and examines certain fine distinctions within each. In the 'transitive' type the Goal is an 'inert affected' and 'the process is being done to it, but the Goal itself does not 'do' the process' (1992:118). In the 'ergative' type the Process HAPPENS to the Medium. Through the investigation of the cryptotypes at work in the system of TRANSITIVITY, she suggests a number of distinctions within each of the transitive and the ergative in order to produce a full picture of TRANSITIVITY. She develops a system network of TRANSITIVITY, (in this description, the area of 'material' Processes) that incorporates these important distinctions. And, perhaps most importantly for the present work, she identifies certain TRANSITIVITY types that are not found in Halliday's network and which need to be recognized as stated here. In doing this, she extends the system of TRANSITIVITY that Halliday's work (1967, 1968, 1985/94) proposes by allowing for the transitive and ergative distinctions to be modelled through Participant Role configuration within the main TRANSITIVITY system.

Most importantly for the present research, Davidse recognizes problematic TRANSITIVITY types that must be accounted for in a useful system network for generating the TRANSITIVITY options. I propose that the Cardiff Grammar is able to handle even the most problematic types that she identifies. The details of the CG are presented in Chapters 4, 5 and 8.

3.2.5 Matthiessen (1995) Lexicogrammatical Cartography: English Systems

In Matthiessen 1995 we find a very full account of TRANSITIVITY, both in terms of the grammar modelled in a network – the aspect that was missing from Halliday 1985/94 – and also in terms of the lexis of each Process Type.

Matthiessen's presentation of the system of TRANSITIVITY is built on Halliday's 1985/94 foundations, but with some alterations. The most obvious difference is that he recognizes fewer Process types than Halliday does. In line with Halliday (1967/68 and 1985/94) he states that the experiential metafunction serves to classify different fields or domains of experience; a field of consciousness (an aspect of our internal consciousness), a field of happening and doing (external and changeable through time), and a field of being and having (external and stable through time), (Matthiessen, 1995:202), and he suggests that these domains are captured by four primary Process type systems. Matthiessen states that 'the current grammar is slightly different from IFG in the area of PROCESS TYPE', (1995:210), and whereas Halliday recognizes six different Process types, including 'behavioural' and 'existential', Matthiessen is only concerned with 'material', 'mental', 'verbal' and 'relational' Process types, with 'behavioural' and 'existential' occurring as subsystems.

This description of Matthiessen 1995 will firstly consider how he regards the experiential aspect of the wider model, and it will then turn to describe in detail the Process types that he recognizes. It should also be noted that Matthiessen divides TRANSITIVITY into two domains; 'nuclear' transitivity and 'circumstantial' transitivity. This distinction reflects Fawcett (1980)'s clear separation of Circumstances and Participants, where he treats Circumstances as outside the system for TRANSITIVITY. The present description will be concerned only with nuclear transitivity, since it is this area that covers the Processes and Participants in the clause, and since it is with these aspects that my research is concerned. His description of 'circumstantial transitivity' – which is concerned with the circumstantial roles in the clause – is outside of the scope of the research to be presented here.[35]

Matthiessen suggests that the 'instantiation' of the experiential in the clause has a predictable structure, with the elements of Process, Participants, and any Circumstances being typically realized through the units of verbal group, nominal group and prepositional group respectively. In order to illustrate how Participants and Circumstances can be recognized in this way, he offers Examples (1a) and (1b):

(1a) The farmer shot at the duckling - 'the duckling' is Circumstance
(1b) The farmer shot the duckling - 'the duckling' is Participant

I suggest that defining the Circumstance in this way is not useful to the analysis. In these examples it is not the status of *the duckling* that changes. An 'ergative' transitivity analysis recognizes that *the duckling* is the 'Affected entity' in both examples – and so a Participant in both examples. What I propose is that the two examples involve two different Processes, with the lexical simple verb *shoot* having a partly different meaning from the lexical multi-word verb *shoot at*. In his description of participation in and circumstantiation of the Process, Matthiessen suggests (following Halliday 1985/4) that 'the difference between Participants and Circumstances is a cline (scale), reflecting the degree of involvement in the process' (1995:196). However, in the Examples (1a) and (1b), the involvement of the entity *duckling* in the Process does not alter, and so does not 'move' on the cline of participation/circumstantiation. In fact, what alters is the type of Process taking place, with a relatively un-subtle semantic difference between the action of *shooting* and the action of *shooting at*.

Matthiessen, like Davidse, does recognize the importance of the differences between Process types, and the sometimes very fine distinctions between semantic categories. He states that, as with all categorization, 'there are prototypical cases with all four process types, but there are also more intermediate, borderline cases'

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[35] See Ball, (forthcoming), and Ball and Tucker (2000) for a description of the Cardiff Grammar approach to circumstantial transitivity.

(1995:204). These are peripheral senses which, if set on a cline as he suggests, might arguably fall into either of two categories. This notion of fuzzy edged categories is exemplified diagrammatically in the well recognized representation given on the cover of the second edition of Halliday's IFG (1994). It is therefore interesting that Matthiessen does not recognize in his description of 'nuclear transitivity' Halliday's 'behavioural' and 'existential' 'SECONDARY' Process types as fuzzy edged categories. Rather, Matthiessen recognizes these Process types as 'subcategories' in the network.

In classifying Process type, Matthiessen states that what determines the position of a Process in a 'space' of experience 'include[s] the degree of 'potency' of the participants (animacy, volitionality, etc), the degree of their affectedness (state change), the degree to which the process can project another process, and so on' (1995:221). This indicates that in his view a Process should be classified not according to its 'stand-alone' meaning, but is largely measurable according to the Participants associated with it. Therefore, TRANSITIVITY is discernible from the configuration of Process and Participants. And so the framework for TRANSITIVITY that Matthiessen describes includes simultaneous systems of PROCESS TYPE (and so choice between 'material', 'mental', 'verbal' and 'relational' Processes) and AGENCY, which enables choice of Participant Role configuration, in terms of whether the clause is to be 'effective' or 'middle'.

The most useful approach for the present description of Matthiessen 1995 is to present his system networks for each Process type, and to then consider his modelling of the associated lexical verbs.

We shall initially consider how his description splits grammar and lexis. He provides a full network for the grammatical end of each Process type system, i.e. the least delicate section of the system network. He also acknowledges the 'lexis as most delicate grammar' approach, and presents a table indicating the range of subtypes that can be produced at a level of further delicacy than the four major Process types, using the sub-categorization from Roget's Thesaurus as his basis (1995:217).

In the light of his acceptance of 'lexis as most delicate grammar', it is interesting that he deals with the lexis for each Process type as a section that is separate from the grammar. Throughout the description he uses a 'sub-categorisation' method for producing further delicacy to the point of lexical output that is similar to that of Hasan 1987 (Section 3.2.1). However, he does not provide the delicate system network that will generate the lexical item. He presents his subcategories in a 'table' format which stops one step short of modelling them in a network. It is not clear why he does not take this additional step.

In this description I will show how his table format can be reorganised as a system network. I will initially consider each Process type in turn, and I will then present his description of 'material' lexis as a system.[36]

3.2.5.1 Matthiessen's 'Material Grammar' (1995:235)

Matthiessen's description of 'material' Processes is the same as Halliday's 1985/94 description, with the one difference being that Matthiessen does not recognize 'behavioural' Processes as belonging to a different group from the 'material' Processes. Matthiessen uses the term 'material grammar' for the area of experience through which we convey actions, activities, events and behaviour. His description of this system is based initially on the fact that 'material' Processes can either be 'middle' or 'effective'. We have already seen this distinction of VOICE in the description of Halliday's framework above.

Matthiessen's description of 'middle' clauses is that they 'represent happenings' (1995:237), and that there is no external causation. These Process types involve either 'qualitative change', as in Example (2), or 'locative change' as in Example (3):

(2) The house collapsed.
(3) She ran down the stairs.

Although there is no external cause in 'middle' clauses, there is a possibility for another Participant to be present in the form of a Range, as in Example (4):

(4) She climbed a mountain.

His description of 'effective' clauses is that they involve a Goal and 'represent doings' (1995:240). He states that 'from the ergative point of view, an Agent that brings about actualization of the Process is actualized through the Medium; and from

[36] For reasons of space, only Material lexis can be considered in this description.

the transitive point of view, the Actor's involvement in the Process extends to impact on another Participant, the Goal.' (1995:240). Therefore, all effective material clauses are 'Actor/Agent + Process + Goal/Medium'. It is interesting that he uses this double labelling, and, as we shall see in Chapter 5, the Cardiff Grammar does not use these two sets of labels, but uses the essentially ergative terms 'Agent' and 'Affected' as features in the system network for generating PROCESS TYPES.

The choice of 'effective material process' leads to a system that chooses the 'type of doing', and the choice is between 'dispositive' Process and 'creative' Process. A 'dispositive' Process involves an already existing Goal as in Example (5), whereas a creative process brings the Goal into existence, as in Example (6).

(5) He polished it.
(6) Others are building small dams.

We will see in Section 3.2.3.5 below how he extends the system for 'creative' Processes towards lexical delicacy.

3.2.5.1.1 Behavioural Processes

Unlike Halliday's 1985/94 description of TRANSITIVITY, for Matthiessen 'behavioural' Processes are a sub category of 'material' Processes. This is similar to Fawcett's 1980 approach. The 'behavioural' Process type includes 'grooming' Processes, such as Example (7), and so requires specification in the system for the generation of a reflexive pronoun. And they may also involve co-participation, as in Example (8):

(7) She washed herself.
(8) Henry and Anne danced.

Matthiessen separates 'behavioural' Processes into two groups. The first group is of 'intro-active' behaviour, which involves Processes of 'grooming', but also 'mental-like' Processes of 'perception' and 'cognition', such as 'feeling', and 'pondering'. And the second group is of 'interactive' behaviour, which includes 'verbal-like' Processes, and some 'activity-like' Processes, for example 'chatting' and 'fighting'.

Chapter 5 will show how in the Cardiff Grammar these Processes are either 'mental' Processes ('feeling' and 'pondering'), or 'one role', 'action' Processes ('chatting' and 'fighting'). Although the Cardiff Grammar recognizes that fuzzy edges occur in categories, this is not modelled through the introduction of new Process types, but in a similar manner to Matthiessen, as subcategories in the system network.

3.2.5.2 Mental Processes

Matthiessen's description of 'mental' Processes is comprehensive and includes all aspects of the 'mental' domain of experience. The 'mental' Processes involve 'consciousness', and include a 'Senser' and a 'Phenomenon'. Again, this description of 'mental' Processes is in line with Halliday 1985/94. In the system for 'mental' Processes, simultaneous choice must be made in three further systems, the first being the SENSING system, which leads to choice between 'cognitive', 'desiderative', 'emotive' and 'perceptive', the second being PHENOMENALITY, which leads to a choice between 'non-phenomenalization' and 'phenomenalization', and the third being AGENCY, which is the system we are familiar with; the choice between 'effective' and 'middle'.

Matthiessen does not state how – through this simultaneity – he would account for the fact that an 'emotive' or a 'desiderative' Processes cannot be 'effective'; i.e. they cannot involve agency. Although 'simultaneity' is desirable in producing elegant and economical networks, exceptions do occur, as is typical of language. To avoid over-generation in a network, the network writer must either repeat the features for each subsystem, or he or she must include rules that preselect certain aspects of generation. For example, the Cardiff Grammar uses 'same pass' rules to specify choices that must be made in generation, and this will be further described in Chapter 4.

'Mental' Process clauses are particular in their potential inclusion of a projected phenomenon, and it is this aspect that Matthiessen's system of PHENOMENALITY actualizes. Therefore, if the feature 'non-phenomenalization' is chosen, then the resulting clause will be something such as (1a) and (1b)

(1a) I understand.

(1b) I grieve.

These examples would be dealt with in the Cardiff Grammar as being 'mental' Processes involving two roles, with one being COVERT. Matthiessen makes no mention at this point of the 'overtness' or 'covertness' of roles, and it is only if 'phenomenalization' is chosen that a Participant of the type 'phenomenon' will be included in the clause, as in examples (2) and (3):

(2) I enjoy music.

(3) I heard the children.

Interestingly, Matthiessen proposes that the choice 'non-phenomenonalization' can only be chosen if the choice 'middle' is made in the system of Agency, therefore restricting the clause to having one Participant Role. Therefore, Matthiessen would generate (1a) and (1b) differently to the Cardiff Grammar, as he does not recognize the possibility of a second role occurring with these Processes.

The system of SENSING includes further semantically-based sub-choices of 'perceptive', 'cognitive', 'desiderative' and 'emotive'. The choice of 'perceptive' leads into a network that chooses firstly between 'general' and 'specific'. The choice of 'general' generates lexical verbs of perception such as 'sense', 'perceive' and 'imagine'. The choice of 'specific' leads to particular types of perception, and generates lexical verbs such as 'feel', 'see', 'smell', 'taste' and 'hear'.

The feature [cognitive] in his 'mental' Processes network clauses enables the projection of a thought into existence as a proposition. He illustrates this portion of the network by describing the way in which the projection may occur, and he proposes that projectING Process may be followed by projectED Process. Therefore, the Phenomenon in a 'cognitive' Process clause will very likely be a 'situation'.

He presents the 'cognitive' system as being split into the areas of 'thinking', 'knowledge', 'opining', 'doubt', 'pretence', 'understanding' and 'memory', with each area generating the following examples of lexical verb: 'think', 'know', 'guess', 'doubt', 'pretend', 'understand' and 'forget'.

The next area of 'mental' Process that he introduces is that of 'desiderative'. Interestingly, this is the first time we find this Process type in a systemic functional grammar, as it is not shown in as Halliday 1985/94[37]. Matthiessen states that 'desiderative' clauses can project intention or desire as a proposal. And he proposes that the category can be split into the following areas with corresponding lexical verb: 'preference' ('want', 'hope'); 'desire' ('ache for', 'desire'); 'plan' ('aim for', 'intend'); and 'decision' ('choose', 'decide'). The 'desiderative' area of 'mental' Processes can only function as a 'middle' construction, and so this restriction would need to be accounted for in the network. It is interesting that this is the case, as 'desiderative' Processes do not always involve just one role.

The final area of 'mental' Processes that he considers is 'emotive' Processes. Often these Processes 'arise in response to some Phenomenon', and 'occur with embedded facts.' (1995:261). For the generation of these Process types, he proposes two simultaneous systems.

The first, like the other systems of choice that we have seen for the generation of lexical delicacy, is for choosing the sub-type of 'emotion'. These sub-types all involve a positive and negative option, and they and the respective lexical verbs that they generate are as follows:

'like' (positive: 'like', 'love'; negative: 'hate');
'fear' (positive: 'reassure', 'comfort'; negative: 'fear', 'alarm');
'happiness' (positive: 'please', 'rejoice'; negative: 'mourn', 'grieve');
'anger' (high: 'enrage', 'madden'; low: 'dislike', 'resent');
'interest' (positive: 'enjoy', 'amuse'; negative: 'bore').

The second simultaneous system is exclusive to 'emotive' Process types, as 'one of the properties of emotive processes in general … is the scalar nature of the verbs realizing them' (1995:276). Therefore, choice must be made in a system that indicates a scale of intensity of the emotion – so the choice must be made between 'normal' and 'intensified'.

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[37] However, see the description of the Cardiff Grammar in Chapter 5 for Fawcett's (forthcoming a) treatment of 'desiderative' Processes.

3.2.5.3 Verbal Processes

In the 'verbal' Process system there is always a 'Sayer' Participant (which need not be conscious), there can also be a Participant which is the Verbalization (i.e. what is said), and there can be a Participant who is the Receiver of what is said.

If verbalization is not chosen, then **non-verbalization** will be chosen. This then leads to a further choice of either 'processes of verbal behaviour' or 'processes of verbal impact' depending on whether the lexical verb to be generated involves 'behaviour', such as 'speaking' or 'arguing', or whether it involves some kind of 'impact' such as 'blaming' or 'congratulating'.

However, if Verbalization is chosen, then the Participant 'Verbiage' will be included in the clause, and this will be realized as a 'name' or a 'locution'. The choice of locution leads to choice between whether the verbiage will be 'quoting' or 'reporting', and 'indicating' or 'imperating'.

Having determined the Verbiage options, a choice must be made to determine the Receiver of the message. If 'no receiver' is chosen, then there will be no Participant in the clause to whom the 'verbal' Process is aimed.

In the Cardiff Grammar, these 'verbal' Processes are analyzed as Processes of Cognition, and we assume that there is always an Affected-Cognizant, even if it is covert and unrealized at the level of form.

However, for Matthiessen, only if 'Receiver' is chosen will the clause include a further overt Participant. The Receiver will either be a nominal group, when the Process is something like 'ask', or a prepositional group with the preposition either 'to' or 'of' when the Process is something like 'read' or 'ask'.

Matthiessen states that the occurrence of 'receiver' is what marks the process 'verbal' and not 'mental'. Because there is an external Participant, it 'contrasts with the senser-internal content in mental clauses' (1995:293).

3.2.5.4 Relational processes

'Relational' Processes convey the domain of experience that is concerned with 'being' and 'having'. Matthiessen's system for the primary section of the 'relational' Process network is the conversion of Halliday's proposal in 1985/94 modified into the form of a system network. Therefore, we can determine the initial section of the 'relational' Processes network for Matthiessen from Section 3.1.14 above.

Essentially, the network firstly presents a choice between '**existential**' 'relational' Processes, which are those conveying relations of 'being', and '**expanding**' 'relational' Processes, which lead to a further system.

On choosing 'expanding', simultaneous systems are entered; the first being for choice of 'relational abstraction', and the second being for choice of 'relation type'. 'Relational abstraction' requires a choice between 'identifying' or 'ascriptive', and 'relation type' requires a choice between 'circumstantial', 'intensive' and 'possessive'.

What Matthiessen's description does include – as well as presenting the Hallidayan framework as a system network – is an extension of the network in terms of delicacy. He sub-categorizes the 'relation type' choices into further semantically based categories, which he presents in the following table:

		ascriptive	identifying
intensive	non-phase: unmarked	*be*	*be*
	non-phase: other	*make, constitute, form, produce,* *weigh, cost, measure, number…* *exceed, outnumber, matter, hurt, suffice, abound, figure, differ…*	*symbolize, represent, mean, signify,* *define, constitute, realize, translate,* *spell, imply, sum up, add up to …*
	phase: reality	*seem, appear, sound, look, taste, smell*	*seem*
	phase: time	*become, go, turn, grow, remain, keep, stay*	*become* *remain, stay*
	assigned: expanding	*make, render, turn, keep ensure, verify,* *brand, call*	*appoint, choose, elect,* *brand, call, name, christen*
	assigned: projecting	*declare, decree, proclaim, assume, believe, think intend, want, wish*	*declare, decree, proclaim assume, believe, think*
possessive	non-benefactive	*have, lack, need, deserve, feature, boast* *contain, house, include*	*possess, own*
	benefactive		*provide, afford, owe*
	other extending	*combine, join*	*accompany, combine with, contrast with, distinguish replace, substitute for*
circumstantial	spatio-temporal	*last, take, date (from), range (from/to)*	*cross, circle, surround, span, dominate, support, face, parallel, take up*
	manner: comparative	*become ('suit'), suit*	*resemble, match, fit, exceed, outnumber*
	matter	*concern, deal with, treat, go into*	*cover, touch upon, discuss, review, summarize*
	cause	*depend on, hinge on*	*bring about, cause, produce* *condition* *conflict with, contradict, preclude, prevent*

Table 3.3, 'Lexical Spread of Verbs in Relational Clauses', Matthiessen, 1995:323

This table shows how Matthiessen pushes Halliday's framework for 'relational' TRANSITIVITY towards lexical output, thus nearing the goal of 'lexis as most delicate grammar'.

In the next section we shall take this notion one step further.

3.2.5.5 Matthiessen's 'Material Lexis'

At the beginning of this section on Matthiessen 1995 I proposed that after outlining his broad framework for TRANSITIVITY I would then reinterpret his proposals as the lexical end of a TRANSITIVITY network. As Table 3.3 illustrates, he produces tables of subtypes of Process. What this section will now consider is how his table for '**creative**' 'material' Processes can be realized as a network. The conventions used in this proposed system network are those used in the Cardiff Grammar, and are those that will be used in the reported research that is presented in later chapters. Most importantly, the numbers occurring after the lexical verbs in the network are representative of numbers referring to realization rules.

```
material ->
creative/
dispositive.

creative ->
event (occurrence)/
thing.

event (occurrence) ->
general/
expansion.

general ->
perform (0.001)/
do (0.002)/
make (0.003)/
take (0.004).

expansion ->
phase_time/
conation/
causation.

phase_time ->
begin (0.005)/
start (0.006)/
open (0.007)/
continue (0.008)/
stop (0.009)/
discontinue (0.010).

conation ->
fail (0.011)/
succeed (0.012)/
attempt (0.013)/
try (0.014).

causation ->
cause (0.015)/
bring about (0.016).
```

thing ->
neutral/
build/
symbol/
culinary/
cloth/
hole/
other.

neutral ->
create (0.017)/
make (0.018)/
prepare (0.019)

build ->
assemble (0.020)/
build (0.021)/
construct (0.022).

symbol ->
design (0.023)/
draft (0.024)/
draw (0.025)/
forge (0.026)/
paint (0.027)/
sketch (0.028)/
write (0.029).

culinary ->
bake (0.030)/
brew (0.031)/
cook (0.032)/
mix (0.033).

cloth ->
knit (0.034)/
sew (0.035)/
weave (0.036).

hole ->
dig (0.037)/
drill (0.038).

other->
establish (0.039)/
open (0.040).

Figure 3.15 Matthiessen's lexical spread 'creative' 'material' Processes presented as a system network.

It is interesting to see Matthiessen's lexical spread of creative material verbs in the form of a network, and it would appear that he has a fairly large coverage of lexical verbs included – forty in all in this case. However, it would be interesting to know more about his methodology for creating sub-classifications of lexis. We simply do not know whether the starting point for his classification is the creation of the subcategories with the verbs then included to exemplify the categories, or whether his starting point is a body of verb senses from which he created the subcategories.

The approach of the present research to ensure that a broad coverage of frequently used verbs is described fully in Chapter 8. The research to be presented in this thesis begins with a set of frequent Processes, which are then classified using an existing framework, thereby testing the framework rather than just using examples that support it.

Having considered the most recent detailed work in the Sydney grammar on TRANSITIVITY, we are ready to consider the most recent developments in the description of TRANSITIVITY in the Cardiff Grammar. However, first we need to consider the exact nature of the Cardiff Grammar and the COMMUNAL project. Chapter 4 will provide this overview, and will provide us with details of the necessary mechanisms involved in modelling language in a generative computer system.

4: An Overview of the Cardiff Grammar

4.1 Introduction to the chapter

The Cardiff Grammar (CG) is a model of language that finds its basis in Systemic Functional Linguistics (SFL), and has grown from the work of a number of scholars at Cardiff University. The tenets of this branch of the SF theory come in particular from the ideas first presented by Fawcett in his 1973/81 paper ‘Generating a sentence in a systemic functional grammar’, which were expanded upon in his 1980 book, ‘Cognitive Linguistics and Social Interaction’.

We have already come across some of the early formulations of what is now known as CG in the discussion of Transitivity in Chapter 3, where we considered both Fawcett 1973/81 and Fawcett 1980. In both publications Fawcett makes the case for a model of language which encompasses the cognitive AND the social, with particular emphasis on ‘a treatment of grammar in which it is seen not as an entity on its own, but part of a mentality’ (1973/81:181). Indeed, the subtitle of his 1980 book is ‘Towards an integrated model of systemic functional grammar and other components of a communicating mind’.

The Systemic Functional model of language has been attractive to researchers in the field of Natural Language Generation (NLG) because of the emphasis placed on the concept of SYSTEM, and of CHOICE within that system. SFL has been considered as particularly useful to NLG, because of the attention paid not only to the grammar but to all aspects that need to be considered for language generation – that is, a MIND.

Using Fawcett 1980 as the guiding theoretical framework, the COMMUNAL project[38] came into being in 1987. This is a long-term NLG project, which is concerned with the development of a computer model of language that uses SF principles. The other main large SF computer grammar is the NIGEL grammar of the PENMAN Project (Mann and Matthiessen 1983/85, Matthiessen and Bateman 1991), which works on similar principles. However, COMMUNAL is a more advanced grammar due to a number of improvements. For example, COMMUNAL puts into computational practice fully semantic system networks that are able to generate both syntactic structure AND lexical items on a single continuum. And, using such system

[38] COMMUNAL stands for Convivial Man-Machine Understanding through Natural Language.

networks, COMMUNAL also includes richer and more powerful realization rules, which function to specify the actual lexicogrammatical output. Halliday states that the computer implementation of CG and the NIGEL grammar are 'among the largest grammars existing anywhere in computational form' (1994:xii).

This chapter has two main sections. The CG is a grammar that aims to provide for both the generation and the analysis of language. The concern of those developing CG has been the provision of a descriptive AND a generative grammar, and thus the modelling of the generation and the understanding of language. And so the present chapter will reflect this division of labour. The first section will be concerned with a description of the generative component of the COMMUNAL project and the important features of the grammar that make it so useful for language generation. And the second section will describe how the grammar can be used as a tool for the text analyst – that is, the descriptive use of CG. While the two are developed together, the text description work on an area of the grammar is typically a little ahead of the full computer implementation.

Of particular interest to the present research is the CG development of semantic system networks, or, more specifically, the modelling of the meaning potential of language to the point of 'lexis as most delicate grammar' (Halliday, 1961), which was described in Chapter 3. This is one of several significant advances that CG offers over other SF grammars – i.e. the system networks are both semantic, and they model 'lexis as most delicate grammar'[39]. The NIGEL grammar is described in Tucker 1996 as having been unable to implement this, and so as having had to use a separate lexicon, and as far as I am aware this situation has not changed in the intervening years. Halliday states that 'there is no clear line between semantics and grammar, and a functional grammar is one that is pushed in the direction of the semantics' (1994: xix), and the goal of the CG (and so COMMUNAL) is to push the grammar all the way to the semantics.

[39] Although, as we saw in Section 3.2 of Chapter3, other system networks have been produced which display 'lexis as most delicate grammar' (eg. Hasan 1987), CG is the only grammar at the present time to be actively working towards the semanticization of the whole grammar.

4.2 The COMMUNAL project and GENESYS

The reason for discussing the COMMUNAL project's use of the Cardiff Grammar first is to assess the importance of certain characteristics of the model that are necessary for language generation. These characteristics also underpin the theory, and add to the richness of the description. The grammar can then be examined in the light of these features, which will be taken individually and described below. These features are **choice in system networks, realization rules, probabilities, 'same pass' rules, the higher planners** and **the belief system**.

4.2.1 System Networks and the concept of choice

The 'system networks' are the modelling of what Halliday calls the 'meaning potential' (1970:142). Meaning potential is viewed as a set of choices open to the language user, and the system network is an excellent formalism for expressing choice. This, as we shall see, is a network of choices to be made, a pathway through which will **instantiate** the meaning potential.

Fawcett (2000a:36) illustrates how language can be viewed in this way in a diagram that includes 'the four components that are essential for modelling any semiotic system.'

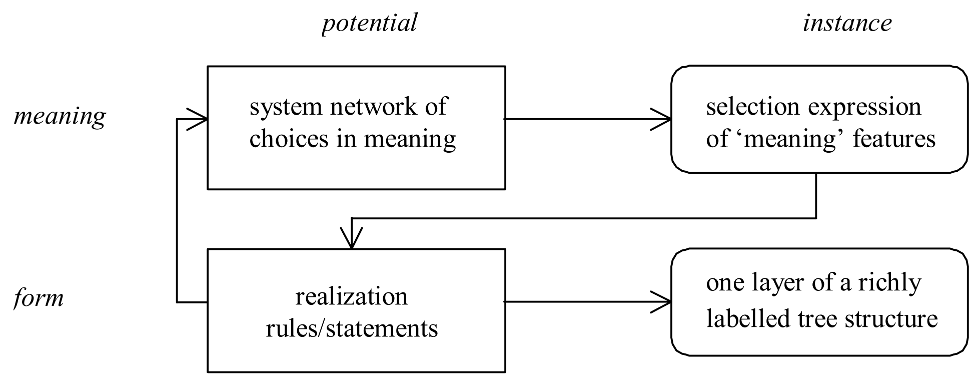

Figure 4.1 'The main components of a systemic functional grammar' (Fawcett 2000a:36)

This recognition of 'potential' and 'instance', and the 'meaning' and 'form' of language is a fundamental aspect of Systemic Functional Grammar, and is in contrast with Chomsky's notion of 'competence' and 'performance'. By viewing language from an alternative position to Chomsky's – that of Halliday's meaning 'potential' and its instantiation – one is able to build a model in which all instances of language can be described and classified. Thus, rather than concentrating on the syntactic rules of language 'competence', SF linguists assert that instead 'in these terms it is the role of the system networks to specify what a user of a language 'can mean'.' (Fawcett 1980:55).

Halliday summarises this notion by stating that:

> 'The system network is a theory about language as a resource for making meaning. Each system in the network represents a choice: not a conscious decision made in real time but a set of possible alternatives, like 'statement/question' or 'singular/plural'." (Halliday, 1994:xxvi).

A full pass through a network gives a set of options that have been chosen on that pass, and these form a 'selection expression'. This is a bundle of features that will then be taken to the point of realisation. However, the selection expressions alone cannot be the specification of the grammar. As Tucker (1996) points out, the important thing about a SF approach is that the contrasts are shown in a network, i.e. what is not chosen is also available for the user to contrast with what IS chosen.

The present research models verbs, using the CG approach to develop a semantic classification using system networks. As we have seen in Chapter 2, other large examinations of verbs include the treatment in WordNet (Fellbaum 1998) and Levin's classification of their alternations they take (Levin, 1993). These are not concerned with verb senses as choices in the context of related choices in the lexicogrammar, but with verbal entries in a lexicon. Rather than 'dividing up the lexicon into semantic fields' (Fellbaum, 1988:69), my research presents the separate semantic fields as being reached by a process of choice between alternatives.[40]

It is useful to acknowledge not only the network's ability to present contrastive choice, but also the presentation of 'dependency'. In Fawcett's words

[40] This notion will illustrated be fully defined in Chapter 8.

(1980:19) ‘a system makes available a choice between two or more features, but the availability of such a choice is always dependent on the selection of a logically prior feature’. By recognising the important function that the network serves in offering contrasts between features in the network, we can also recognise that the network can be interpreted from two directions – the direction of choice and language generation, and the direction of dependency and so of language understanding.

Any network begins with an ‘entry condition’, and it is this feature on which the subsequent features depend. The entry condition, in fact, defines the network – the choices to be made are made to express meaning in the general area that is identified by the entry condition. Thus, in the CG network for ‘Process type’ in Figure 4.2 below, the entry condition ‘relational’ defines the fact that in this network we will be choosing a ‘**relational’** Process type. And the choice of [possessive], [attributive], [locational] or [directional] can only be made BECAUSE we are in a network for ‘relational’ Processes, and so these choices are dependent on the entry condition.

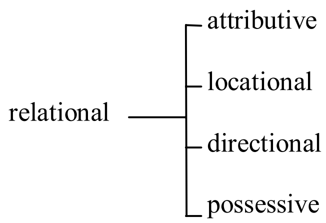

Figure 4.2: The early portion of the system for ‘relational’ Processes.

Thus we use the entry condition to enter a network, and we then make choices within the network guided by higher planning decisions and our beliefs about the world, and ultimately we produce a ‘selection expression’ of features.

4.2.2 Realization Rules

When all the possible choices on a particular ‘pass’ through the network have been made, the features are collected into the ‘selection expression’, which is an ‘instance’ at the level of meaning. The grammar then inspects each of these to see if it has a realization rule attached to it. The function of these rules, in the words of Fawcett et al (1993:119), is to ‘specify how the somewhat abstract features that have been chosen in the networks come to be expressed as specific items, structures, and intonation or punctuation'. Chapter 8, Section 8.3.1 will present an example of a full, working realization rule.

In order to produce the appropriate output, the realization rule uses certain 'realization operators' (Fawcett et al 1993:131), and these operators are of two types: Operators (i) to (iv) below build structures and produce descriptions, and Operators (v) to (vii) below predetermine, either absolutely or probabilistically, the features to be chosen on subsequent journeys through the network, i.e. the generation of further features for another unit in the developing tree structure. The most detailed description of how these realization operators function is Fawcett et al (1993), and it is on this that the following description is based.

i. Unit insertion

This operation adds a **unit** to the structure. For example, the feature [situation] is realized by inserting 'Cl' (for clause). The important factor that must be incorporated into the sequence in which the operations apply is that an element of a unit can only be added to the structure when the unit it will depend on has been inserted.

ii. Componence

This operation puts the **elements of structure** in the right 'Places'. The concept of 'Place' is an important one in GENESYS, and numbered places are assigned within a unit. In the largest version of the grammar for example, the unit 'clause' has 251 assigned places, and the 'componence rule' might place the element of structure 'Subject' at 'Place 35'. This rule would be represented as 'S @ 35'. It is interesting to note that the Subject is in fact the most stable element of the clause, and will always occur at Place 35 and a Participant Role will still be conflated with it (for 'conflation' see below). Even if the Subject that has been generated is to be realized covertly, it will still be assigned Place 35, and a Participant Role will still be conflated with it. As we shall see in the second half of this chapter, the relationship between the unit and the composite elements of which it is made up is **componence**.

iii. Conflation

This operation conflates two **elements**. In particular, it conflates a Participant Role with an element of structure. Thus, having placed the element [Subject], the realization rule will conflate the appropriate Participant Role with it – for example, very often the role **Agent** will be conflated with the Subject. Another example of conflation occurs when the Main Verb and the Operator are realized by the same lexical item: in example (1) the Main Verb and the Operator are both realised by the item *is*, and so must be conflated for the structural output.

(1) Connor is a smashing kid.

iv. Exponence

This operation indicates when an element should be expounded by an item. In example (1) above, the element Main Verb was **expounded** by the item *is*. Fawcett et al (1993:132) state that 'it is the relationship of **exponence** that takes the representation out of the abstract categories of **syntax** to **items** (whether **lexical** or **grammatical**), i.e. to phenomena that have a phonological or graphological form'. By adding the operation for exponence to the preceding operations, we are able to detect exactly how GENESYS generates text sentences, combining syntax and lexis and the equivalents in semantics.

v. Re-entry

Typically, the Agent that we have generated (which has been conflated with the Subject) will be filled with a 'nominal group'. So far, the present description of a pass through the network has chosen [situation] and so, by using a 'unit insertion rule', it has added the unit 'clause' to the structure. In order to generate the nominal group that will fill the Agent, we need to re-enter the network and choose [thing] rather than [situation]. And the 're-entry' operation will determine that this happens. The operator would state 'for Agent re-enter at [thing]'. Then, after re-entry and the selection of another set of features, the types of operator met above would insert a nominal group and build its structure.

vi. Fetch Operators

This operation concerns proper names. It is straight forward, and means that an entity must be fetched from memory. For example, if a 'familiar' name (*'Connor'*) is required for the Subject of the clause – i.e. the [thing] to fill the Agent – then the **fetch** rule would specify that it must be fetched from memory.

vii. Preference (including Preselection)

This operation resets probabilities on features for re-entry into the network. What this entails will become clear below, in a description of the necessity for both **probabilities** and **preselection**, or **sp rules** in COMMUNAL.

4.2.3 Probabilities

In order for choices to be made in the system network – particularly when a random generation is being executed by GENESYS – there needs to be some basis on which to establish a reason for each choice to be made. It has long been a guiding principle in SFG that choices should be based on evidence of usage, and that some 'probability' of occurrence should be captured as guidance for choice.

Even in Halliday (1961) – before the concept of system had been fully explored – Halliday recognised the notion of probability as important to a model of language, stating that 'the interaction of criteria makes the relation between categories, and between category and exponent, increasingly become one of "more/less" rather than "either/or". It becomes necessary to weight criteria and to make statements in terms of probabilities.' (Halliday 1961/76:63).

Matthiessen (1999:1) explores the 'quantitative profile of the system of transitivity', giving frequencies of occurrence of different Process types based on actual corpus evidence. From this he is able to determine some probabilities. His corpus sample is very small, consisting of only 2,072 clauses (14,500 words), with the examples coming from mostly written sources. So it is – compared to the other major corpora on which various linguistic evidence is based – very small and limited registerially. However, the hand analysis of a small corpus is the only realistic means for looking at the quantitative nature of TRANSITIVITY, since it cannot (yet) be automated.

Matthiessen states that 'we can interpret the relative frequencies as indicative of systemic probabilities' (1999:46), and by determining the frequencies of the Process types from his sample, he is able to establish some probabilities for the system for PROCESS TYPE as shown in the network presented in Figure 4.3.

PROCESS TYPE
- material (51.0%)
- relational (24.0%)
- mental (9.1%)
- verbal (10.0%)
- behavioural (3.9%)
- existential (2.0%)

Figure 4.3: Matthiessen's (1999) probabilities for the system of PROCESS TYPE

These probabilities then guide the choice-making in the system, and enable 'likely' stretches of language to be generated.[41]

The network itself is a system of **possibilities**. Through discovering likelihoods of occurrence in language, Figure 4.3 demonstrates how we are able to further enrich the network through the application of **probabilities**. In the next section we shall discover how it is possible for these probabilities to change according to other choices in a network through the application of 'same pass' rules.

4.2.4 'Same Pass' (SP) Rules

The Same Pass rules are a relatively new but very important part of the network in CG as they 'make the networks very much richer and more sensitive to different environments, whether of register or immediate linguistic context … (SP rules have) important implications for the way in which we think about the nature of grammatical rules.' (Fawcett and Tucker, 2000:2).

So far in this description of the Cardiff Grammar the types of rule that have been discussed have all been 'realization rules', i.e. rules that are applied after each pass through the network. Moreover, we have seen that the 're-entry rules' are actually applied on a SUBSEQUENT pass through the network.[42] The importance of the

[41] The initial system for TRANSITIVITY in CG is different to that described by Matthiessen, and so the probabilities are different too. The probabilities for the equivalent system in the CG are presented in Figure 6.1 of Chapter 6.

[42] It is because the realization rules work in this way that Tucker 2000 (the 13th EISFW, Glasgow, July 2000) has suggested that it is not in fact 'lexis' that is most delicate grammar, but whatever it is that the realization rule states, as this happens at a more delicate point than the realization of lexis.

SP rule is the ability to specify changes that must be made on the **same pass** through the network (as their name suggests).

Thus, the great extension to SF theory that SP rules provide us with is the ability to make a choice at a point in the network which can alter the options available at a later stage in the network, thus making the system a dynamic phenomenon. I will now explain exactly what this means, using an example from the TRANSITIVITY network.

In the TRANSITIVITY network, once the choices in the initial network have been made – i.e. once we have chosen [action], [two-role process], [plus affected] – we then move into the following section of the network presented in Figure 4.4[43].

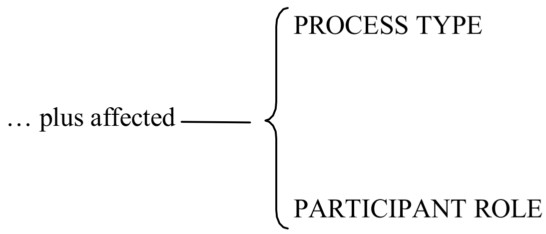

Figure 4.4 Part of the initial system for TRANSITIVITY in CG

This left ‘curly’ bracket is the convention used to convey diagrammatically the connection in the network of **simultaneity**. Thus, these two systems of PROCESS TYPE and PARTICIPANT ROLE are entered simultaneously.

Having reached this point in the network, we will now look at a section of the ‘material action’ network, which is located within the ‘action’ Processes network, as presented in Figure 4.5[44].

[43] The current network for TRANSITIVITY in CG will be presented in Chapter 6.

[44] The full and delicate network for TRANSITIVITY from which this section is taken will be presented in Chapter 8.

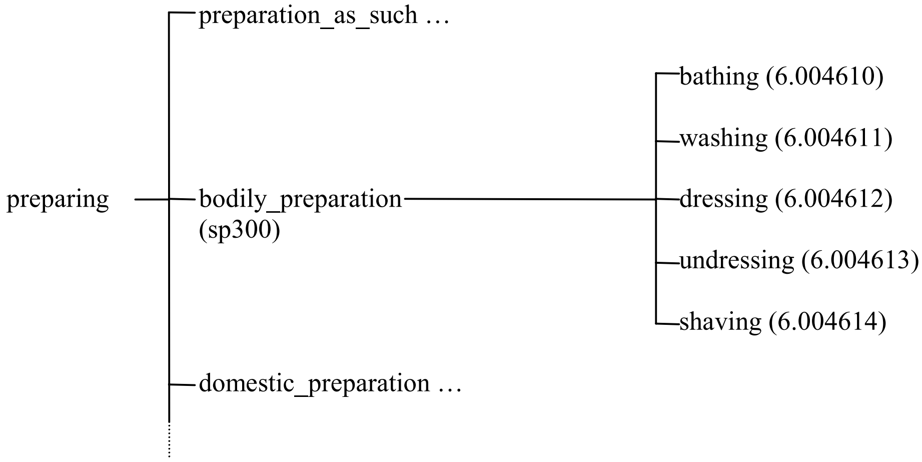

Figure 4.5: The system for [bodily preparation] with 'same pass' rule.

Figure 4.5 includes both realization rules (e.g. 6.004610, which specifies that the Main Verb will be expounded by the item 'bath') and same pass rules. Thus, on the feature [bodily preparation], we find the SP rule (sp300). This rule states that the probabilities must be changed in the PARTICIPANT ROLES part of the network, which, as illustrated above, is entered simultaneously with the PROCESS TYPE network. The probabilities can be changed in the PARTICIPANT ROLE network because in the PROCESS TYPE section of the network is ABOVE the PARTICIPANT ROLES section. Therefore, for the purposes of computational generation the PROCESS TYPE system is entered before the PARTICIPANT ROLE system.

Therefore, the same pass rule 'sp300' in Figure 4.5 changes the probabilities for the system [affected role type], which offers a choice between [affected unmarked], [affected sought], [affected relating out], [affected exclaimed at] and [affected covert].

The reason for the SP rule on [bodily preparation] is that in these types of Process the probabilities for how the Affected entity in the clause will be realised need to be changed from the default. This is in order to assign a higher probability to the likelihood of the Affected entity being covert, for Processes such as 'washing', etc.

The reason why the default settings[45] in the GENESYS network offer a very low probability for 'affected covert' (there is a 0.01% probability of the Affected entity being covert) is that they are set to be relevant to Processes such as 'hitting'

[45] The default settings in GENESYS are for the 'unmarked' option of discourse that is [spoken], [consultative] and [non-technical]. It is because of the SP rules that there CAN be default settings, i.e. because the system CAN change.

etc., where a covert Affected entity is very much less likely to occur.[46] However, in the case of a 'bodily preparation' Process a covert Affected entity is more likely. The SP rule therefore resets the probability to roughly 50% likelihood for 'bodily preparation' Processes in order to generate Example (2), where the Affected, which is covert, would be *myself*.

(2) I washed this morning

Fawcett and Tucker (2000) emphasize that the SP rule is a tool not only for making the network DYNAMIC, but also for making it more ECONOMICAL. They point out that within the overall network there are a huge number of possible unique networks which represent all possibilities for the language, and which could all be individually described (but this would be an immeasurable job to undertake). However, it is both practical and more economical to capture them all in a 'superordinate' network which, through the use of SP rules is an active system, can change its probabilities to accommodate all of the possible choices.

4.2.5 Higher planning

COMMUNAL uses a 'belief system' and various 'planners' on which to base its **input**, i.e. information in logical form that provides a basis for what is to be generated in the GENESYS component.

Having higher planning in the model means that most decisions are made prior to the system networks themselves – the features are selected by **predetermination** from a higher planner. This is different from **preselection,** as used in both realization and same pass rules, where the decisions are made within the system network, and are lexicogrammatical choices. The choices that are predetermined by the belief system and higher planners in COMMUNAL are the results of decisions made outside of the lexicogrammar, and are related to decisions associated with pragmatics, discourse structure and the like.

[46] It is possible, though unusual, for a clause with a Process of 'hitting' to have a covert Affected entity, as in *he hits really hard*.

Let us now look a little more clearly at some of the types of higher planning involved in COMMUNAL. In his argument for viewing language as a ‘program’, Fawcett (1992) proposes that some major components are necessarily involved in the building of a computational model of language. These are as follows:

1. the Belief System, which determines decisions affected by such things as culture, social situation, register, context of co-text, etc.
2. the reasoning and higher planning component, which ‘enables (the system) to recognize a need for a reply’ (1992:634).
3. algorithms that draw upon aspects of the Belief System that are needed in linguistic stages of planning. For example, in the choice of theme, aspectual type, tense, etc.
4. the Discourse Planner, which makes choices in genre grammars and exchange structure grammar.
5. the lexicogrammar/sentence generator – or GENESYS. It is with this part of the model that this research is concerned.

Of specific relevance to this research is the fact that within the belief system there is an ontology of ‘predicate types’ (Fawcett, 1996), which will feed directly into the decision making which affects choices made in the TRANSITIVITY network of the lexicogrammar. In this framework, much of the ‘definition of word sense’ aspect of a dictionary entry finds its place not in the system networks that are used in the generation of language, but in the belief system. As Fawcett says, ‘it is in this higher component – in one that is at TWO removes from the word-form – that the ‘dictionary meaning’ of, say, [knowing situation] is spelled out.’(1996:328).

All the characteristics of the model described in the first half of the chapter go towards ensuring that the output from generation is an acceptable stretch of language. The characteristics are designed to enable the modelling of the meaning potential of the language by making the network (1) dynamic, (2) more delicate, and (3) more sensitive to the likelihood of occurrence of features.

In the first part of this chapter I have surveyed the generative aspect of the model: its ‘meaning potential’ (the system networks) and its ‘form potential’ (the realization rules).

4.3 The Cardiff Grammar as a descriptive tool

In the second part of this chapter I will attempt to describe the theoretical concepts needed for a theory of **instances** that are of use to the text analyst at the level of form. And I shall also describe the ways in which the CG model of language differs from the Sydney version of SFG in its description.

4.3.1 Categories

Halliday's proposal for categories in a **rank scale** has remained unchanged since it first appeared in 1961, with a top to bottom relationship of the ranks of unit: clause; group; phrase; word; morpheme.

The CG approach differs to this. Fawcett does not recognise a 'rank' of units, but a set of three units which are: **clause** (which is defined by having one Main Verb); **group** (which can be of the type **nominal group**; **prepositional group**; **quality group**; or **quantity group**) and **cluster** (which expresses the complex meanings associated with two elements of nominal group, (i) **genitive cluster**, which fills either the deictic determiner or the head of the nominal group, and (ii) **proper name cluster**, which fills the head of the nominal group).

The reason for abolishing the rank scale is partially because Fawcett believes that 'the expectation that every element of the clause would be filled by a group' (Fawcett, 2000b:42) is untenable. Part of the rationale for this view is that the elements of the 'verbal group' are better handled as direct elements of the clause (Fawcett 2000b, and forthcoming). Because of this, Fawcett sees the grammar working WITHOUT the notion of the rank scale, i.e. a 'framework of sentence, clause, group, word and morpheme as a strict hierarchy of constituents, each one being related by constituency to the next.'(Halliday, 1994: 23). Instead, Fawcett proposes that the best means for modelling constituency is by indicating the **probability** of one unit filling an element of another unit, thereby focussing on 'likelihood' for determining how the three types of unit relate to each other. He states that:

> 'we replace the 'rank scale' claim by the statement that (1) the five major classes of unit (i.e., the clause and the four classes of group) all occur quite frequently at a number of different elements of structure within a number of different classes of unit;

> (2) that they do so with varying degrees of probability, and (3) these probabilities (and others) need to be represented in the grammar.' (Fawcett 2000b:283).

Fawcett (2000b) suggests that this difference in the CG from Halliday's theory is helpful to the text analyst, not least because it removes the problem of treating an element of the verbal group as an element in the clause (the 'Finite'). For Halliday these two elements are at different ranks, and so, according to the need for 'total accountability' in the rank scale (Halliday 1966), these two elements should not be conflated.

In CG the **elements of structure** are the components of the units, and each unit is composed of a different set of elements. For example, the main elements of structure within the clause are Main Verb (M), Main Verb Extention, Subject (S), Operator (O), Auxiliary (X), Complement (C) and Adjunct (A), whereas the main elements of structure within the nominal group are head (h), modifier (m), qualifier (q), deictic determiner (dd) and quantifying determiner (qd).

4.3.2 Relations between categories

The description of the CG incorporates the relations between categories. These relations relate back to 4.2.2, as it is the relation of categories to each other that enables realization when generating. As we shall see, it is on these relationships that the realization rules that were described above are based.

For descriptive purposes, these relations have been illustrated through the means of a 'tree diagram', which is the CG method for analyzing text. Thus, Figure 4.6 indicates the relations at each level of rank.

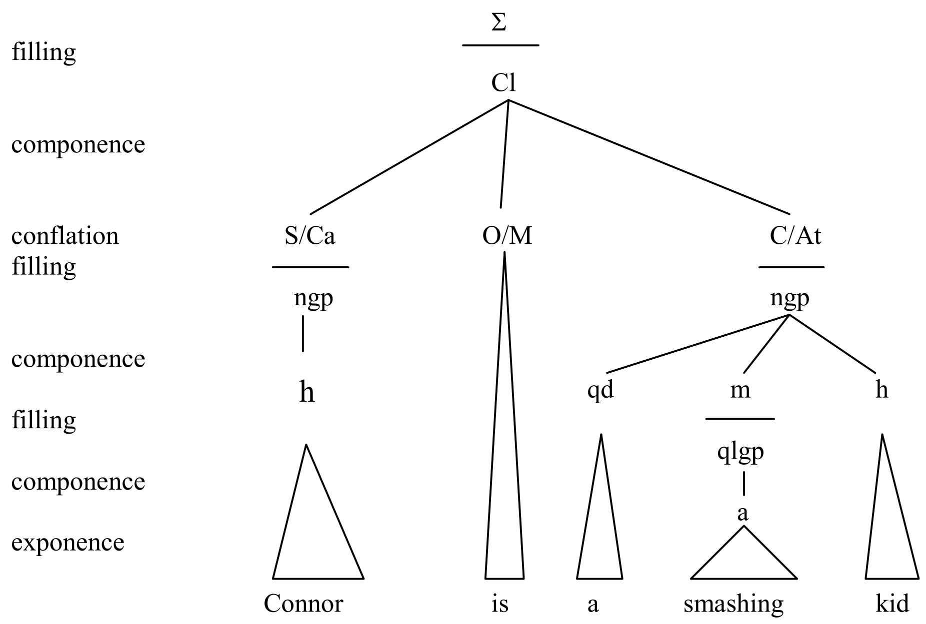

Figure 4.6: Text analysis showing the relations at each level of 'rank'

The relationships are indicated down the left hand side of the tree diagram, with the first one being that of **filling**. This is a relationship between an element and the unit below it, and the first example we see is between the element 'sentence' (signified by the symbol for 'sigma') and the unit 'clause', with the next example being between the element 'Subject' and the unit 'nominal group'.

The next relationship in the diagram is **componence,** which is a part-whole relationship between the unit and its elements, thus the relationship between the unit 'clause', and the composite elements of S, O/M and C.

The relationship of **conflation** is shown in the diagram with the conflation of the two elements Operator and Main Verb, and of the elements Subject and Complement with their respective Participant Roles – as we saw in Section 4.2.2 above.

The final relationship exemplified in the diagram is that of **exponence**. This relationship takes the categories out of the abstractions of syntax, and to the point of phonological or graphological representation. In this example, the Subject is expounded by 'Connor'.

The relationships shown in the tree diagram indicate how this type of analysis is useful to the applied linguist. The tree diagram is a method of analysing syntagmatic relations in a way that is most insightful as the first stage of an analysis, as it is useful for showing the level of complexity of a stretch of language. The more complex the sentence – in terms of the co-ordination and the embedding of units within units – the more detailed and multi-layered the analysis will be[47]. For example, in Figure 4.6 the complexity within the Subject and the Complement is shown by the level of detail required for their analysis, as compared to the element Main Verb/Operator.

Now that we have an overview of the Cardiff Grammar, from the viewpoints of both generation and description, we are in a position to locate within this model the area of particular interest to this research – TRANSITIVITY in English.

[47] Co-ordination and embedding in fact represent another relationship that can occur in a stretch of language – namely that of 'recursion'.

5: TRANSITIVITY in the Cardiff Grammar: the recent model and some new developments

5.1 Introduction to and structure of the chapter

The concept of TRANSITIVITY has already been discussed in detail in Chapters 2 and 3, where various linguists' descriptions of this area of grammar were considered – most notably the stages through which Halliday's model has developed, in Chapter 3. This chapter provides a description of the framework within which the present research has been conducted. It discusses the current version of the approach to TRANSITIVITY in the Cardiff Grammar (CG) and so demonstrates the framework used for my research. It also sets out the way in which my research has in turn contributed to the CG model of TRANSITIVITY. The main tenets of the CG were, of course, discussed in Chapter 4.

The scholar who has written most on the area of TRANSITIVITY in CG is Fawcett (principally 1973, 1980, 1987 and 1996). Fawcett's earlier work in TRANSITIVITY has already been explored, especially his description of TRANSITIVITY in Fawcett 1980 (in Section 3.1.12 of Chapter 3). This chapter is concerned with his development of the system of TRANSITIVITY up to the present. This includes revisions that have been made to his description in the course of the present research, and often partly as a result of it.

The chapter will provide a detailed description of the main Process types in the CG. The first main Process type, i.e. 'action' Processes, is described in Section 5.4, where the focus is on a major change in the 'action' Process type system. This change is the abandonment of the 'agent-centred / affected-centred' distinction which was a primary system in the network in Fawcett 1980. This is an important change, and one that has been introduced into the CG framework under the stimulus of the research presented here. The reason for the change is the need to model different verb senses according to whether the Process involves one or two roles. Section 5.4.1 will present the arguments for this treatment of 'action' Processes.

The second main Process type is 'relational' Processes, and these are described in Section 5.5. Again, this description includes an account of a major change from the descriptions of the 'relational' Process system published by Fawcett so far. There is not only the separation of 'locational' into 'locational' and 'directional' (a change which occurred before the present research) but also the addition of the 'matching' relationships alongside the 'relational' subsystems of 'attributive', 'directional', 'locational' and 'possessive' (a change which was directly prompted by the present research).

The third main Process type is described in Section 5.6, and this is the 'mental' Process system. This area of the grammar has not been described in any detail so far in this thesis, and so Section 5.8 presents the various sub-types of 'mental' Process, with a brief account of important changes that have been made to Fawcett's system of 'mental' Processes.

And finally in Sections 5.7, 5.8 and 5.9 the 'environmental' Processes, the 'influential' Processes and the very new 'event relating' Processes are described.

This chapter therefore highlights the changes that have been made to the theory since Fawcett 1980, and provides the reader with a fairly detailed overview of both the Process types and the Participant Roles involved in the CG system network for TRANSITIVITY.

The aim of this research is to provide delicate semantic system networks for the part of the grammar that generates the Main Verb in the clause, or, in Systemic Functional terms, the Process in the 'situation'[48]. The concern is with modelling the 'experiential' component of language, which Fawcett describes as being where 'we find the meanings through which language reflects the objects, qualities and relationships that a person finds in the world around him' (1980:134). The system networks that are the end product of this research enable the generation of this component of the language for a very large number of Processes.

I consider that the CG is the most appropriate framework for the present research, because the CG places emphasis on networks that model meaning at the level of semantics. The CG already has in place a very large system network for the generation of language, and my research has developed further the system network for TRANSITIVITY to allow the generation of a large number of frequent lexical verbs.

[48] In the Cardiff Grammar, the process in the clause is realized not only by the Main Verb, but also in some cases by one (and occasionally more than one) Main Verb Extension (MEx), and sometimes also a preposition. These occur when the clause contains a multi-word verb, where the Process is extended beyond a single item. A full description of the treatment of multi-word verbs in the Cardiff Grammar is given in Section 7.3.3 below.

5.2 The TRANSITIVITY system in the previous Cardiff Grammar

In the following two sections I will give brief historical accounts of the CG approach to TRANSITIVITY. TRANSITIVITY in Fawcett (1980) was described in Section 3.1.1.2 in considerable detail, and so only a brief account is presented here. However, Fawcett (1987), which concerns ‘relational’ Processes, has not yet been considered, and Section 5.2.2 therefore presents a comprehensive description of this area of the grammar. For the full description of the CG presented in later sections I will also draw upon the computer implemented networks (Fawcett and Tucker 2000) and on Fawcett (forthcoming).

5.2.1 Fawcett (1980) Cognitive Linguistics and Social Interaction

Fawcett states that ‘in the experiential component the referent situation that has been formulated by the performer’s problem solver for transmission to the addressee is viewed as “process”’ (1980:134), and this notion of ‘Process’ is one that will be maintained for the present purposes. The main Process types in Fawcett (1980) are (i) ‘action’, (ii) ‘relational’ and (iii) ‘mental’, and these broad categories are further subdivided in the network for TRANSITIVITY as follows:

(i) ‘Action’ is the entry condition for the portion of network in which the options [agent only], [affected only], [attribuant only], [affected centred] or [agent centred] are given.

(ii) Within the ‘relational’ Process network the choice is between [equative], [classificatory], [associative] and [locational].

(iii) And finally, the network for ‘mental’ Processes gives the choice of [emotion], [perception], [cognition] and [communication].

We shall see below exactly how these TRANSITIVITY choices have been changed to produce the current CG TRANSITIVITY framework.

5.2.2 Fawcett (1987) ‘The semantics of clause and verb for relational processes in English’

This (1987) paper modifies and expands Fawcett’s statement on TRANSITIVITY for the area of ‘relational’ Processes, and holds an intermediate position between his 1980 description and the CG position today. We will examine the important aspects of this version of the model before considering the current TRANSITIVITY system.

Fawcett's 'relational Process' system in 1987 is rather different from his initial proposals in 1980 and presents a more semantically based classification, as can be seen in Figure 5.1:

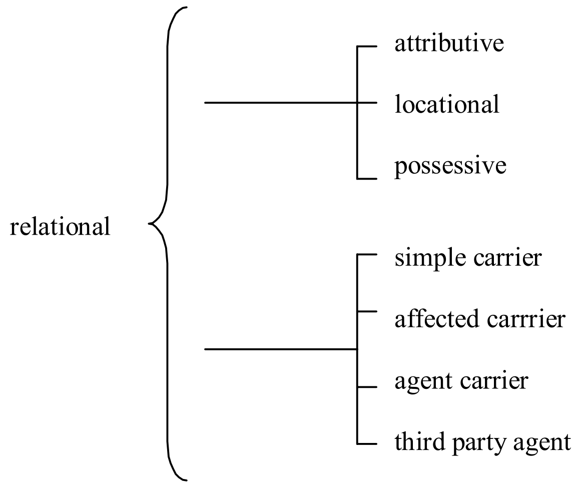

Figure 5.1 'A consolidated system network for relational processes in English' (Fawcett 1987:160)

This network includes three major subclasses of 'relational' Processes that differ both from those proposed in Fawcett's (1980) framework and from Halliday's (1985/94) description. As we saw in Chapter 3, Halliday (1985/94) classifies 'relational' Processes as being either 'attributive' or 'identifying', and also as one of either 'intensive', 'circumstantial' or 'possessive'. We can see from Figure 5.1 that Fawcett recognizes different distinctions between types of 'relational' Process from Halliday, since he describes 'relational' Processes as being 'possessive', 'attributive' and 'locational'.

Figure 5.1 models the possible Participant Role configurations for all the 'relational' Process types. From now on Fawcett's descriptions of TRANSITIVITY use the term 'Participant Role' (PR) instead of the (1980) term 'Inherent Role', as PR is more closely in line with Halliday's terminology. The important features of Fawcett's network are that it includes features whose names refer directly to the role types in the network, and that the role types are chosen simultaneously with the choice of Process type. In the 'relational' Process network all three semantic subclasses of Process type ('attributive', 'locational' and 'possessive') are seen as being able to take the same PR configurations and this generalisation is captured elegantly, with the left hand 'curly' bracket signifying simultaneity. Note too that, as Figure 5.1 shows, Fawcett allows for the generation of compound roles; thus an Agent and an Affected can each be conflated with a Carrier to specify precisely the semantic function of the role.

Particularly important to his 'relational' Process system is the combination of an Agent with the compound role of Affected-Carrier, which is central to the three role Processes that he describes. He terms these 'third party agent' Processes, because a 'third party' is introduced to what would otherwise be a two-role Process. This configuration facilitates the generation of 'possessive' Processes such as Example (1):

(1) Belle gave Sebastian the key.

In this example *Sebastian* functions as a role that is inherently 'expected' by the Process, and it is therefore a PARTICIPANT ROLE, and not a CIRCUMSTANTIAL ROLE. By recognizing this patterning in the system for 'relational' Processes Fawcett does not need to include in his framework Halliday's 'usually optional extra' role of 'Beneficiary' (Halliday 1994:144), and this helps him to draw a clear line between Participant Roles and Circumstantial Roles.

Fawcett states that, although the term 'Beneficiary' is an apparently apt label for the role being described, he prefers the label 'Affected-Carrier', because it can function in the configurations of all three 'relational' Process types. Its use therefore increases the ELEGANCE of his model by generating across three Process types. The term Affected-Carrier denotes the way in which the entity functions as a compound role. Firstly it is that which the Agent 'does something to', i.e. it passes the test for 'affected', which is to re-express the clause in (1) as in (2):

(2) What happened to Sebastian was that Belle gave him the key.

Secondly, it is related to the 'Possessed' entity of 'the key' by also functioning as a Carrier, i.e. it passes the re-expression test for a Carrier in a 'possessive' Process in (3):

(3) It is Sebastian who has the key.

Fawcett further illustrates the 'third party agent' pattern by using two contrasting examples (both taken from Halliday 1970):

(4) I've given Oliver a tie
(5) I've made Frederick a jacket

Interestingly, for Halliday (4) and (5) would be analyzed as 'material' processes, each with the additional role of 'beneficiary'. However, by using the role of Affected-Carrier, Fawcett is able to identify *Oliver* as a PR in the Process of 'giving'. In contrast, *Frederick* is not inherent in the Process of 'making', and is thus a CR. Therefore, for Fawcett, (4) is a 'possessive' 'relational' Process with a 'third party agent':

(4) I (Agent)'ve given (Process) Oliver (Affected-Carrier) a tie (Possessed).

But (5) is a 'material', 'two-role' Process:

(5) I (Agent)'ve made (Process) Frederick ([Client]) a jacket (Created).

Fawcett's classification of 'relational' Processes as being 'possessive', 'attributive' and 'locational' is based on the patterning of the PR's that they take. This means that the range of Processes that he considers to be 'relational' is much broader than that in Halliday (1985/94). Those lexical verbs that he classes as 'possessive' extend much further than Halliday's 'possessive' Processes, and the basis for this is the patterning that they take. If we now consider the more delicate portion of the network for 'possessive' Processes that Fawcett proposes, we will see the value of regarding these Process types as 'relational' rather than 'material' (or 'action').

'Possessive' Processes occur with the following patterns: (a) 'simple carrier' (Carrier plus Process plus Possessed), (b) and (c) 'compound carrier' (Affected/Agent-Carrier plus Process plus Possessed) or (d) 'third party agent' (Agent plus Process plus Affected-Carrier plus Possessed). In all of these patternings Fawcett recognizes 'possessive' Processes as being concerned with both 'having' and 'lacking', and so 'possessive' is the initial choice in the network. Further, he introduces a distinction between a 'possessive' Process being either a 'changing' relation, with someone causing a change in possession (e.g. 'getting' something), or a 'maintaining' relation, with the possessive state remaining (e.g. 'keeping' something).

If the options [having] and [changing] have been chosen in the network, then the next step in delicacy involves a choice between a [permanent] and [temporary] 'possessive' Process, with the final choice of [for money] or [free]. In this way, the delicate semantic differences between the lexical verbs *giving, selling, lending* and *hiring* are captured. From this progression in delicacy, it is possible to see how the lexis may be seen as 'most delicate grammar' (Halliday, 1961/76:69) through its generation from the system network for TRANSITIVITY. Through more and more delicate sub-specifications, the very fine semantic nuances of each verb sense can be modelled, so generating lexical items.

Fawcett provides a similar treatment for the area of the network that covers 'attributive' Processes. This area of 'relational' Processes presents an interesting difference to Halliday's system. In Fawcett 1997, the 'identifying' Processes and the 'attributive' Processes that Halliday distinguishes are subsumed into one system of 'attributive processes'.

In Halliday's differentiation between these two types, one of the key aspects that he highlights is the reversibility of 'identifying' clauses and the non-reversibility of 'attributive' clauses. The examples that Halliday uses are:

Identifying: (6) Tom is the leader
(7) The leader is Tom

Attributive: (8) Sarah is wise
(9) *Wise is Sarah

Halliday states that (9) is not an 'agnate' form of (8) (Halliday 1994:120). However, Fawcett asserts that this non-reversibility is not a reason to set up the two types as different Processes, but that 'the reversibility [of pairs of examples such as (6) and (7)] is handled in terms of thematic choice (so that it does not appear in the relational process network).' (1987:175). Moreover, there are Processes that Halliday states to be identifying which are not reversible (1985/94:122), such as (6a), which can be compared with (7a), which is ungrammatical in this sense.

(6a) Mr Garrick played Hamlet.

(7a) Hamlet played Mr Garrick.

For Fawcett, the means for modelling the semantic difference of 'attributive' and 'identifying' comes at a more delicate point in the system network for 'attributive' Processes. It is a choice of whether the 'attribute' is a 'thing', a 'quality', a 'situation', etc. In arguing against making the distinction between 'identifying' and 'attributive' in a primary system, Fawcett is able to quote Halliday's statement that "identity may be merely the limiting case of inclusion"'. And Fawcett then goes on to state that 'the essence of what is proposed here, then, is that what makes certain clauses identifying (or "equative") is not the process realized in the clause, but the equativeness between two nominal groups.' (Fawcett 1987:138).

In Fawcett's description of 'attributive' Processes, the compound role of Affected-Carrier occurs again in the 'third party agent' pattern, and he explains that his reason for treating 'attributive' Processes in the same way as 'possessive' Processes is because of 'the striking semantic parallels' (1987:151) between two pairs of clauses. Thus (10) is to (11), as (12) is to (13).

(10) Sebastian has the key.

(11) Belle gave Sebastian the key.

(12) Sebastian is the boss.

(13) Belle made Sebastian the boss.

As with the system network for 'possessive' Processes, the 'attributive' network includes the distinction between a 'changing' relation and a 'maintaining' relation as a move in delicacy (e.g. 'going' quiet and 'keeping' quiet). Again with this Process type, choices are made in Fawcett's 'attributive' system network that enable the generation of lexical items. And the differentiation between Halliday's 'identifying' and 'attributive' is made possible, in the case of *a doctor* or *the doctor*, through **re-entry** to the 'thing' network, where the nominal group will be generated.

The third type of 'relational' Process that Fawcett considers in this 1987 description is the 'locational'. This category is not recognized by Halliday; instead his third 'relational' Process type is classified as 'circumstantial'. In Fawcett (1987) the Process type of 'locational' follows the same patterning as the other 'relational' Process types, and, as with the 'attributive' Processes, the PR of Affected-Carrier is involved. It would be illogical for the role of 'Beneficiary' to occur with a 'locational' process, e.g. for 'her books' in (14) to be described as a 'Beneficiary'.

(14) Belle keeps her books in a drawer.

It is interesting to note that Fawcett treats (15) – which Halliday regards as an 'action' Process – as a 'locational' Process.

(15) He marched the prisoners.

Halliday famously uses this clause as an example in his early description of TRANSITIVITY, as we saw in Section 3.1.5 in Chapter 3. Unlike Halliday, Fawcett recognizes as 'relational' Processes those Processes that are '"verbs of motion" such as *walk, drive* and *fly*' (1987:159) (and he also adds 'marching' in this group). He suggests that they generally require a PR of 'location', even if that role is covert (i.e. unrealized at the level of form)[49]. And these 'locational' verbs of motion adhere to the 'relational' pattern that Fawcett has proposed, with an Agent-Carrier, as in (16), or a 'third party' Agent, as in (17).

(16) The prisoners (Agent-Carrier) marched (Process) (to the barracks) (Location).

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[49] However, some of these verbs of motion also occur as 'action' Processes, of the type 'agent-only'. This is found in the use of the verb that indicates habitual activity, for example, '*Sebastian jogs (every morning*').

(17) He (Agent) marched (Process) the prisoners (Affected-Carrier) (to the barracks) (Location).

For Fawcett, the most important reason for treating these Processes as 'locational' and not 'circumstantial' is that the two roles in examples such as (18) i.e. *Ivy* and *in Peru*, are equally inherent in the Process, and *in Peru* is thus a Participant Role and not a Circumstantial Role.

(18) Ivy is in Peru.

In examining Fawcett's (1987) description of 'relational' Processes, three main differences from Halliday's (1985/94) framework have been identified. Firstly, Fawcett includes in his system network for 'relational' Processes features that generate 'compound roles', and these convey the semantic subtleties of the Process types, and allow for an economic pattern of role configuration to be assigned to all three 'relational' Process types. Secondly, Fawcett has only one system for 'attributive' Processes, within which both of Halliday's 'attributive' and 'identifying' Processes can be generated. And, thirdly, Fawcett does not recognize Halliday's 'circumstantial' Process types. Fawcett shows that these Processes can be handled with the 'attributive' or the 'locational' sub-network – the latter modelling location in both space and time.

Thus, Fawcett's 1987 system for relational processes is as follows:

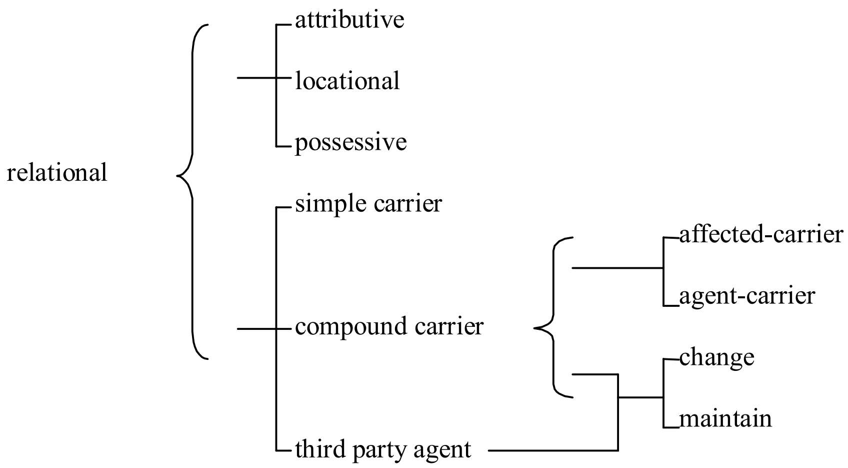

Figure 5.2 Fawcett 1987:161, 'A maximally economical system network for relational processes in English'.

This summary of Fawcett's 50-page paper makes clear that his emphasis is on the importance of semantic system networks from which the TRANSITIVITY structures and the lexical verbs are generated. His proposals for a system of 'relational' Processes have been formulated with this premise in mind. Further, the system captures the important generalisation that all three 'relational' Process sub-types function with the same Participant Role configurations. Therefore, Fawcett's network for 'relational' Processes fulfils two Systemic Functional goals of producing grammars that are both elegant, and 'systemic semantic' (1987:179).

Nevertheless, this network can be, and is, expanded upon. As a result of having produced a large list of frequently occurring Processes, there are many verbs that suggest the desirability of change to this part of the TRANSITIVITY network, and, as we shall see in the next few sections, these have now been made.

5.3 Overview of the current CG TRANSITIVITY network

In the current CG TRANSITIVITY network the three main Process type categories are as they were in 1980 – 'action' processes, 'relational' processes and 'mental' processes. But there are also three further categories in the current framework: the two important networks of 'influential' processes and 'event-relating' processes, and also the minor and referentially limited 'environmental' processes. This chapter will provide an account of the functioning of all six. The initial features in the system network for TRANSITIVITY are presented Figure 5.3, which is presented as a table rather than as a system network because the percentages included are not probabilities that will occur in the system network, but instead are the figures for the number of 'types' found to occur in the Process Type Database (PTDB). The initial choices in the system network are presented in Figure 6.1 in Chapter 6, and the PTDB is described in Chapter 7.

Process type	Sub-Process type
54% action	37% one role
	63% two role
31% relational	8% attributive
	49% directional
	20% locational
	15% possessive
	8% matching
10% mental	56% cognition
	16% perception
	28% emotion
2.6% influential	
2.3% event relating	
0.1% environmental	

*Figure 5.3 The initial features in the system network for Process Type and the frequency of occurrence of each **type** in the PTDB.*

The three main categories – 'action', 'relational' and 'mental' – are broadly similar to Halliday's main Process type categories. However, Halliday's description includes three further categories that he considers to be located at the 'boundary' areas, sharing features of the main categories. In the rest of this chapter we shall see the reasons why these further Process types, of 'behavioural', 'verbal' and 'existential' Processes, do not need to be assigned separate subnetworks in the CG framework.

5.4 'Action' Processes

What is now called the 'action' Process network in CG continued for some time after Fawcett (1980) to be called the 'material process' network, following Halliday's own terminology (1985/94). But in recent years Fawcett has returned to the use of the term 'action' (Fawcett, forthcoming), and this is the label that the present research will use. As the research reported here demonstrates, the main reason for this is that there are a very large number of what might be termed 'non-material' action Processes. There are many 'social action' processes that pass the requisite tests for Processes of this type but which, I will argue, do not involve any material action. This point will be expanded upon in Chapter 8, where I describe the proposed new system network for 'action' Processes in full detail. As we shall see, a division will be made in the 'action' network between [social action] and [material action].

In this chapter we shall only cover the initial systems of the 'action' sub-network, i.e. those that determine which Participant Roles are inherently involved in the Process. The more delicate options, i.e. their 'overtness' and 'covertness' etc., will be introduced in Chapter 7.

The first portion of the action process network is presented in Figure 5.4.

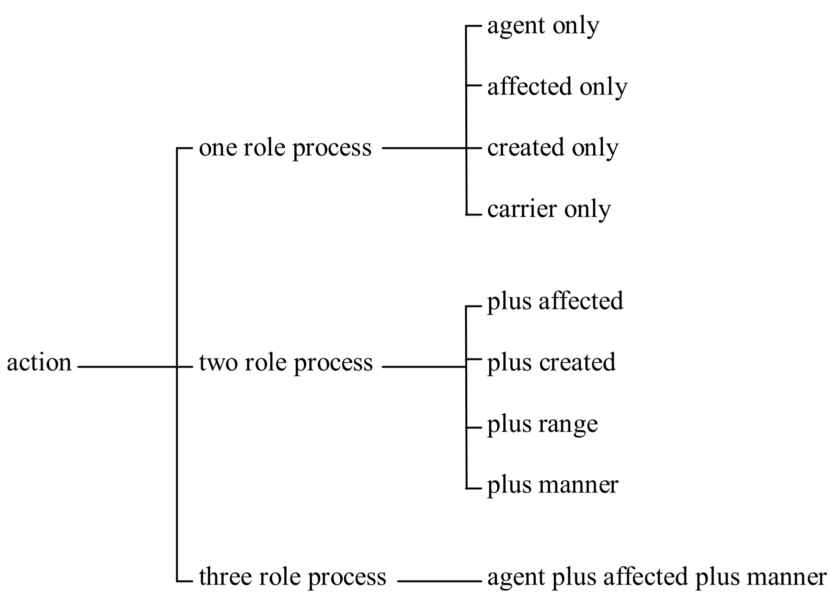

Figure 5.4 The current System Network for Action Processes in the Cardiff Grammar

Some significant changes can be detected when Figure 5.4 is compared to the previous descriptions of the 'action' Process network in the CG – specifically that of Fawcett (1980) (as described in Section 3.1.12 of Chapter 3). The first and most obvious change is that the primary distinction is now in the number of Participant Roles. In Fawcett (1980), the entry condition [action process] led into a single system in which both 'one-role' and 'two-role' Processes could be chosen. This is no longer the case. The entry condition [action process] now leads to the choice between a system for [one-role process], a system for [two-role process] and a system for one very infrequent type of [three-role process], which will be discussed below.

This new aspect of the network leads to another major change in the network, which is the abandonment of the system that offers a choice between [agent-centred] and [affected-centred]. In the next section we will look closely at this change, which has in part been made as a result of the evidence accumulated in the research reported here.

5.4.1 Why there is no system of [agent-centred] versus [affected-centred] in the current CG

Consider examples (1) and (2):

(1) The glass broke.

(2) Sebastian broke the glass.

Levin (1993) would regard these two as 'alternations' of each other, as would many linguists, and this viewpoint was reflected in Fawcett's network (1980:137) for 'action' Processes[50]. Having made the choice [action process] in the system network, and on having reached the entry condition [affected-centred] the 1980 system used to lead to a possible 'simple' Process, which would be a 'one-role', 'affected only' Process, OR a [plus agent] Process, which would be a 'two-role' Process. Either of these choices would lead to the same network for choice of Process type, with realizations such as *change, break, cook, melt,* etc.

Fawcett's terms 'agent-centred' and 'affected-centred' are an attempt to provide more explicit labels for what are often called 'ergative' and 'transitive' clauses. Halliday (1967 and 85/94) distinguishes these two types by using different Participant Roles for each; transitive clauses involve 'Actors' and 'Goals', and ergative clauses involve 'Agents' and, by 1985, 'Mediums'. Fawcett (1980) departs from the use of the terms 'transitive' and 'ergative', and from the two sets of PR's, and proposes a means for distinguishing the two types in which 'the terms used …

[50] The term 'alternation' is used based on Levin 1993; the example given here would be, for Levin, a *causative/inchoative alternation* (Levin, 1993:2/3).

have the advantage of reflecting the fact that it is the "centrality" of a particular inherent role in each process that determines its nature' (Fawcett, 1980:140).

One of the innovations resulting from the present research has been that this distinction is no longer made in the current CG system network for TRANSITIVITY, which models the difference through other means. At the centre of the argument lies the distinction between a 'one role' 'ergative' example such as (1) and a 'two role' 'ergative' example such as (2). Here I wish to suggest that the two examples exemplify different senses of the verb '*break*' rather than a single verb with two different associated patterns of PRs. I suggest that what is referred to in these examples are two separate Processes: in *the glass broke* (1), an object changes its state into the state of being 'broken', while in *Sebastian broke the glass* (2), an agent either intentionally or unintentionally CAUSES an object to change its state into the state of being broken. And these two meanings can be modelled successfully using the current CG framework for TRANSITIVITY. Indeed, we will see in Chapter 8 the way in which these two situation types are now modelled at different places in the system network of TRANSITIVITY, and I will there give further reasons for having two features in the network rather than one to generate these two Processes of 'breaking'.

The question that must be addressed at this point is whether this proposal loses an important generalisation. My opinion is that it does not. The grammar still shows that the two senses of 'break' share a single form, through the fact that they share the same realization rule in the system network for the purposes of generation. And the common ground between the two senses of 'break' is similar to that between 'rise' and 'raise', and 'die' and 'kill', etc. Indeed it would be inconsistent to treat the two senses of 'break' in a way that is different from the distinction between 'die' and 'kill'.

I would also point out that a generalisation which captures (1) and (2) seems very like a 'transformation', as in a TG grammar, with one type (probably the two role, causative example) being presented as the 'norm' and the other as a 'transformation' of it. The SF perspective does not aim to generate norms and transformations, but to generate directly the most appropriate instance of language for a given context, based not only on form but also on function. A move away from a formal 'alternation' such as this one is therefore in keeping with the general SF approach to language.

In further support for the decision to dispose of the 'agent-centred' versus 'affected-centred' distinction, I will return briefly to Davidse's work on 'transitivity' and 'ergativity'(which was considered in Section 3.2.2 of Chapter 3). In her paper 'Transitivity/Ergativity: the Janus-headed grammar of actions and events', Davidse considers example (1) to be an 'ergative middle', which is equivalent to the CG analysis of it being 'one role' and 'affected only'. She states that 'the ergative middle leaves it open whether the action was self-instigated or external' (1992:114). This statement, in my view, provides support for my earlier reason for not generalising the two separate senses of 'break' in the grammar. In the construction of the 'one role' or 'middle' type (1), there is no implied, recoverable 'agent', and so this should not be modelled in the system.

It is proposed here that the terminology used for introducing PRs involved in 'action' Processes provides a means for describing all meaning types, and while the use of Agent and Affected may colour the system to make it seem more causative – and therefore more ergative – the presence (overt or covert) or absence of these PR's provides a useful means for analyzing ALL types of 'action' Process.

Further, it is interesting to consider Davidse and Geysken's (1998) paper, 'The ergative causativization of intransitives', (which is shortened to 'ECI'). Here they look at the introduction of the role 'instigator' to the non-instigatable structure of the intransitive:

intransitive:	(3) the dog walked
an ECI construction:	(4) he walked the dog

As Davidse and Geyskens point out, this recognizes a pair that seems to be neither 'inergative-ergative' nor 'intransitive-transitive', but 'intransitive-ergative'.

The CG analysis of this pair would be:

(3a) the dog walked (for exercise)	[agent only]

or more probably

(3b) the dog walks to the park	[directional, two role]
(4a) he walked the dog (for exercise)	[agent plus affected]

or more probably

(4b) he walks the dog to the park. [directional, three role]

This phenomena is an argument for recognizing these two (or four) occurrences of *walking* as different senses, and so far not using the generalisation of the agent-centred / affected-centred distinction.

In Fawcett's (1980) TRANSITIVITY system network, on making the choice [affected-centred], the next system choice is between [simple] (i.e. 'one role', 'affected only') or [plus agent] (i.e. 'two role'). However, in recognizing this 'ECI' construction, Davidse and Geyskens highlight the fact that example (3) is not a 'one role', 'affected only' process, but an 'agent only' process, in which *the dog* undertakes the action of *walking*[51]. Thus, Davidse and Geysken's study adds weight to the argument for not distinguishing between 'agent-centred' and 'affected-centred', but for distinguishing between 'one role', 'affected only' Processes, 'one role', 'agent only' Processes and 'two role', 'agent plus affected' Processes.

The argument for abandoning the 'agent-centred / affected-centred' distinction is a result of following through to a logical conclusion the notion that the distinction between 'transitive' and 'ergative' reflects the PRs involved in the process. By classifying all the PRs in the 'action' Process system network as either Agents or Affecteds, or both, the CG framework has enough labels to indicate the degree of the causation.

5.4.2 Further changes to the 'action' Process system network

Other changes have been introduced to the 'action' Process system, but these are mainly changes in terminology, and have no major theoretical implications. For example, in Figure 5.4, the one-role Process system includes an option for 'carrier only'. In the 1980 system this choice was an 'attribuant only'. This change is

[51]This example is not the most obvious for illustrating this point, as typically we do not talk of 'dogs' undertaking exercise on their own, and thus they do not typically function as Agent in a 'one role', 'agent only' process. However, the example is used here so that the discussion is parallel to Davidse and Geysken's (1998).

because the role 'carrier' transcends all the Process type systems, i.e. it occurs with 'action' Processes, 'relational' Processes and 'mental' Processes, whereas 'attribution' is a feature that is restricted to the 'relational' Process system.

One other change that should be highlighted is that Fawcett has introduced a further option in the 'action' Process system, and this for a small semantic type that makes use of the PR 'manner'. This is used in the generation of both 'two role', 'action' Processes as in (1) and the only 'action' Process in the grammar that involves three PRs as in (2):

(1) Belle behaved badly.	Agent plus Process plus Manner
(2) Sebastian treated her well.	Agent plus Process plus Affected plus Manner

These roles of 'manner' might at first seem to be in a borderline area between being PRs and CRs. The occurrence of the CR 'manner' is highly frequent in corpus studies of CRs, as Ball's research shows (Ball, forthcoming). In studying the occurrences of CRs in a corpus, Ball discovered that adjuncts of 'manner' are the third most frequently used adjunct type. However, in Processes such as those in (1) and (2), the Manner seems to be INHERENT in the Process. Fawcett points out that in examples such as *he isn't behaving* there is still a Manner (which is probably 'well'), even though it is covert (personal communication). For comparison, an example of a Manner Adjunct is given in (3), and this illustrates the type of Manner that is not inherent in the Process, and is therefore an Adjunct.

(3) Sebastian ate his supper <u>in the most peculiar way</u>.

This section, which has considered the current framework for 'action' Processes in the CG, can be linked with Chapter 8, where the delicate system networks for the area of 'action', 'affected only' and 'action', 'two-role', 'agent plus affected' will be presented.

5.5 Relational Processes

Section 5.2.2 gave a detailed description of Fawcett's (1987) treatment of 'relational' Processes. In this section I will present two major alterations to this that are found in the current CG description. The first is the introduction of a further 'relational' Process type, or, rather, the division of the 'locational' Process type into two systems. The second alteration is the introduction of a completely new 'relational' Process type – that of 'matching' – which I will describe in Section 5.6.2.

5.5.1 The introduction of the category 'directional' Processes

In the current framework, Fawcett 'splits' his (1987) 'locational' Process type system into two systems, one of **location** and one of **direction**. As we saw in Section 5.2.2, the (1987) system for 'locational' Processes included a choice between [change] and [maintain], and this system applies to 'attributive' and 'possessive' Processes as well[52]. By introducing a further Process type of 'direction', Fawcett has in effect 'lifted' this system of [change] or [maintain] to be a choice in a less delicate system.

Figure 5.5 illustrates the change involved in the shifting of a system in this way.

[52] In Fawcett (1980) the terms used to describe this choice were 'stative' and 'dynamic'.

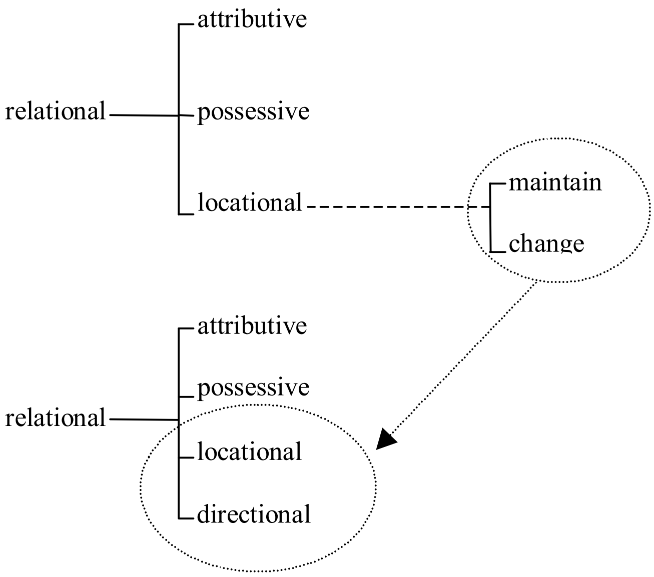

Figure 5.5 The introduction of 'directional' as a relational process.

By introducing a further Process type, Fawcett seems at first to lose the neat patterning of the system for 'relational' Processes. In the 1987 system network, each type has not only the same possible PR configuration but also the same initial choice for the further semantic specification of [change] and [maintain]. Essentially, Fawcett moves this [change] versus [maintain] option from the 'locational' Process type network to become part of the primary system in 'relational' Processes, and he does not use it with either the 'locational' or the 'directional' Process types.

The four Process types still have the same possible configurations of PRs, so that the generalisation captured in Figure 5.2 (in Section 5.2.2) is still maintained. However, the probabilities are different. Most 'locational' Processes choose 'Simple Carrier', and most 'directional' Processes choose one of the other options.

At this point it will be interesting to consider Halliday's treatment of this area of the grammar. Unlike Fawcett, he regards the roles involved in Processes such as the ones we are presently concerned with as 'circumstantial' elements, i.e. 'associated with or attendant on the process' (Halliday, 1994:150), rather than as roles that are INHERENT in the Process.

Halliday's system of 'circumstantial' Processes includes seven major types of circumstance, one of which is 'location'. This leads to a system that contrasts 'rest' and 'motion', as is shown in the system network-like presentation of his 'circumstances of location' in Figure 5.6, where the choice of [motion] leads to a 'directional' (though Halliday does not use this term) choice between [towards] and [away from].

			Spatial	Temporal
Location	Rest		in Sydney at the airport	on Tuesday at noon
	Motion	Towards	to Sydney	till Tuesday
		Away from	from Sydney	since Tuesday

Figure 5.6 Halliday, 1994:153, 'Rest and Motion'

If we compare this contrast with Fawcett's proposals, we can see parallels with the latter's 'maintain' and 'change', and thus with his 'locational' and 'directional'.

In contrast with Halliday, Fawcett's model of directionality involves an explicit choice in the network between three directions: 'source', 'path' and 'destination'. 'Source' is the PR in the clause that gives information regarding where the direction originates, as is found with Processes such as *leave*, as in (1):

(1) Belle left Britain.

'Path' is the PR that conveys where the movement takes place, on the way from the 'source' to the 'destination', and it is found with Processes such as *pass* as in (2):

(2) Belle passed the lake.

'Destination' is the PR most commonly found with 'directional' Processes[53], and it conveys where the movement is directed. It is found with processes such as *go to* as in (3):

[53] This is based on conclusions drawn from the analysis of the Process Type Database. Overwhelmingly, the most frequent 'directional' Processes in the data involve a 'destination'.

(3) Belle went to China.

Further, a clause containing a 'directional' Process may involve a combination of these direction types, as in (4):

(4) Belle went from her house (So), past the lake (Pa), to the bus stop (Des).

Example (4) is accounted for in the current CG TRANSITIVITY system, as presented in Figure 5.8, at the end of the present section.

In 'directional' clauses such as (1), (2), (3) and (4), a prepositional group will typically realize the PR that conveys the direction, and the direction type can be identified by the preposition involved. Example (4) shows how this is the case, with *from* indicating the source, *by* indicating the path, and *to* indicating the destination.

Fawcett's elevation of the distinction between 'change' and 'maintain' in the system is limited to the distinction between 'locational' and 'directional' Processes. The 'possessive' Process type system includes within it the [change] versus [maintain] system for the generation of the lexical verbs *keeping* (a 'maintain' type process) and *giving* (a 'change' type process). This choice is one that is made upon entry to the 'possessive' system network, and not before. Why then is it necessary to 'split' the semantic functioning of 'locational' Processes? The answer is that the PRs involved in the 'locational' Processes of 'remaining' somewhere and 'keeping' something somewhere (where the roles are typically nominal groups which describe place, or location) are clearly rather different from any of the three roles involved in the 'directional' Processes of 'going' and 'sending', where the role itself expresses the directionality. Fawcett points out (personal communication) that one indication of the difference is that it is only the PR of Location that can be confused, at times, with a Place Adjunct; the 'directional' PRs have no circumstantial equivalents.

In the current CG framework for 'relational' Processes then, modelling the different configurations of PRs is paramount and takes precedence over the 'desirability' that networks should express generalisations. While the notion of drawing 'economical' and 'elegant' networks is a useful goal, the network writer must always allow for the exceptions that occur in language for a fully generatable grammar.

5.5.2 Matching Processes

One of the new developments in the CG framework for TRANSITIVITY is the introduction of the new 'matching' type 'relational' Process. Previously, the option of the Participant Role 'Matchee' was only generated in a couple of places in the 'action' and 'emotion' networks, and it enabled the generation of 'three role', 'action' Processes, such as *marrying* or *introducing* as in Example (1), and 'three role', 'emotion' Processes, such as *preferring* as in Example (2):

(1) Belle introduced Sebastian to Macy.
(2) Belle preferred Sebastian to Macy.

Interestingly, however, data generated by my research has led Fawcett and myself to recognize a group of new Process types that require a further general category for their adequate classification. The research involved me assigning PRs to large numbers of lexical verbs that frequently occur, which are thus required to be modelled in a comprehensive grammar, and many of which did not fit the established categories. By approaching TRANSITIVITY in this 'bottom-to-top' manner – rather than taking an existing framework and exemplifying it using lexical verbs (i.e. top-to-bottom) – one is forced to recognize the need for a further set of categories to model the language.

In a list of problematic Process types, it became apparent that some of the problem verb senses involved similar semantic roles and thus formed a semantically related group. In consultation with other colleagues working on the COMMUNAL project, Fawcett and I found ourselves exploring the notion that Processes that express the general concepts of 'matching' and 'linking' involve entities which do not behave as 'Agent plus Affected', i.e. as 'action' Processes. The 'Agent plus Affected' analysis suggests an imbalance of power between Participants. It seems clear that Processes such as *meeting* are not of this type.

Fawcett (forthcoming) describes and justifies our system network for this new 'relational' Process type, and in this section I will draw on that publication. The system network is shown in Figure 5.7:

matching	simple carrier	Ca + Pro + Mtch	e.g. *match, go with, fit, differ from*
	affected-carrier (infrequent)	Af-Ca + Pro + Mtch	e.g. *combine with, separate from*
	agent-carrier	Ag-Ca + Pro + Mtch	e.g. *marry, combine with, separate from*
	plus third party agent	Ag + Pro + Af-Ca + Mtch	e.g. *match (up) with marry to, join to, combine with, separate from*

Figure 5.7 'The major options in the 'matching' part of the TRANSITIVITY network (Fawcett, forthcoming a, Chapter 3, Section 3.4.5)

As Figure 5.7 shows, the possible PR configurations of this new Process type follow the same pattern as that of the other 'relational' Processes, of 'Carrier plus Matchee', 'Affected-Carrier plus Matchee' (which is very infrequent), 'Agent-Carrier plus Matchee', and the three role option of 'Agent plus Affected-Carrier plus Matchee'.

The Processes that this new category models can be divided into two broad areas. Firstly, there are those which involve 'matching': either with two roles, as in *a matches b*, or with three roles, as in *a matches b with c*, and secondly those which involve 'joining': either with two roles, as in *a joins b*, or with three roles, as in *a joins b with/to c*.

5.5.3 The treatment of 'matching' Processes in other grammars

5.5.3.1 Francis, Hunston and Manning (1996), COBUILD Grammar Patterns: Verbs (1996)

There seems to be little treatment of these verbs as a specific semantic group in the literature. However, the account with the fullest coverage is that given by

Francis, Hunston and Manning (1996), where the two-role 'matching' type Processes are described as 'ergative reciprocals'.

Of these 'ergative reciprocal' verbs, the pattern combinations that we should be concerned with (i.e. the semantic group with which we are concerned) are as follows. Firstly, they describe 'pattern combination 1' (1996:510) which is:

plural-noun + verb	(5) the liquids will blend.
verb + *with* + noun	(6) the chocolate blends with the coffee.
verb + plural-noun	(7) blend the remaining ingredients.
verb + noun + *with* + noun	(8) blend the butter with the sugar.

The 'verb groups' – i.e. semantically based groupings of verbs – associated with this patterning are what Francis, Hunston and Manning (1996) class as the 'merge' group, the 'intertwine' group, the 'separate' group, the 'dovetail' group and the 'alternate' group.

Secondly, the pattern that they describe which relates to the CG 'matching' Process types is 'pattern combination 3' (1996:510). This pattern combination is as follows:

plural-noun + verb	(9) the chairs all matched.
verb + noun	(10) her hat matched her coat.
verb + plural-noun	(11) match two lengths of cloth.
verb + noun + *to/with* + noun	(12) we will match the fabric to your existing furnishing.

There are five verbs that COBUILD recognize as having this patterning: *match; overlap; marry; touch* and *wed*.

The verb groups that COBUILD associate with these patternings are described in the COBUILD grammar, and from these descriptions we can see that the verbs in these groups are all sub-types of what the CG would now analyze as 'matching' Processes.

The "combine" and "separate" groups are concerned with the 'joining' or 'un-joining' of two or more things, either physically or metaphorically, and include verbs such as *amalgamate; blend; combine; conjoin; connect; decouple; dovetail; entwine;*

fuse; integrate; interlink; interlock; intertwine; interweave; join; lace; link; merge; mix; overlap; separate; tie; touch; unify; add up; line up; link up; mix up.

The "compare" group is concerned with 'seeing a similarity, difference, or connection between two or more things' (1996:61), and includes the following verbs: *compare; conflate; connect; contrast; distinguish; equate; juxtapose; match; mismatch; muddle; reconcile; relate; separate*.

The "link" group is concerned with the linking of two or more things, or the making of a connection, and includes the verbs: *anchor; compare; connect; correlate; index; liken; link; match; relate; tie.*

These COBUILD lists provide us with classifications of verbs that are grouped according to systemic relationships. These groupings serve as useful 'checklists' when considering which 'matching' type verbs we must model in the grammar.

5.5.3.2 Levin English Verb Classes and Alternations (1993)

Levin (1993) also provides an account of verbs of this type in her section on 'verbs of combining and attaching'. As we saw in Chapter 2, her framework involves the correlation between semantic groupings of English verbs and the alternation that each group can enter into. She states that, with respect to her 'verbs of combining and attaching', 'their hallmark is participation in the simple reciprocal alternations, the *together* reciprocal alternations, or both' (1993:159). She uses these two alternation type labels for describing the way in which the verb may or may not involve a prepositional group occurring within the Complement in the clause.

The subclasses that Levin proposes are 'mix verbs', which are in my view prepositional verbs, taking the prepositions *with, into* and *to*; 'amalgamate verbs', which are prepositional verbs taking the prepositions *with* and *to*; 'shake verbs', which take the prepositions *with, into* and *to*; and 'tape verbs', which take the prepositions *to/onto*. However, she does not refer to these as prepositional verbs, but rather recognizes that the alternation type will take a certain preposition. The CG allows for the generation of such accompanying prepositions in the same way as it does for the prepositions that can accompany 'directional' Processes – through the system network for PARTICIPANT ROLES, which, in turn, leads to the system network for generating a prepositional group.

5.5.3.3 Matthiessen's Lexicogrammatical Cartography (1995)

Within a SF context, Matthiessen (1995) gives an account of some of the Processes of this type. He treats these Processes as 'relational', but gives consideration to the following verbs only:

Process	**CG treatment**	**Matthiessen's treatment**
conflict	Ca + Mtch	circumstantial relation, of the type 'cause'
contrast	Ca + Mtch	possessive relation
fit	Ca + Mtch	circumstantial relation, of the type 'manner-comparative'
match	Ca + Mtch / Ag + Af-Ca + Mtch	circumstantial relation, of the type 'manner-comparative'
parallel	Ca + Mtch	circumstantial relation, of the type 'spatio-temporal'
resemble	Ca + Mtch	circumstantial relation, of the type 'manner-comparative'

Table 5.1 Matthiessen's treatment of the CG 'matching' processes (adapted from Matthiessen, 1995:323)

From Table 5.1 we can see that Matthiessen treats nearly all of these verbs as 'circumstantials', which is a category that is semantically very diverse.

From this brief investigation of other scholar's treatment of this area, we can see that other scholars recognize that these verbs function in a semantically related way, and as such they must be dealt with by the grammar, and are worthy of treatment as a distinct Process type. Therefore, another new type of 'relational' Process is developed.

5.5.4 Summary of 'relational' Processes

To conclude this section on 'relational' Processes, Figure 5.8 is the current 'relational' Process system network in the CG, and it includes the introduction of the two new 'relational' Process types:

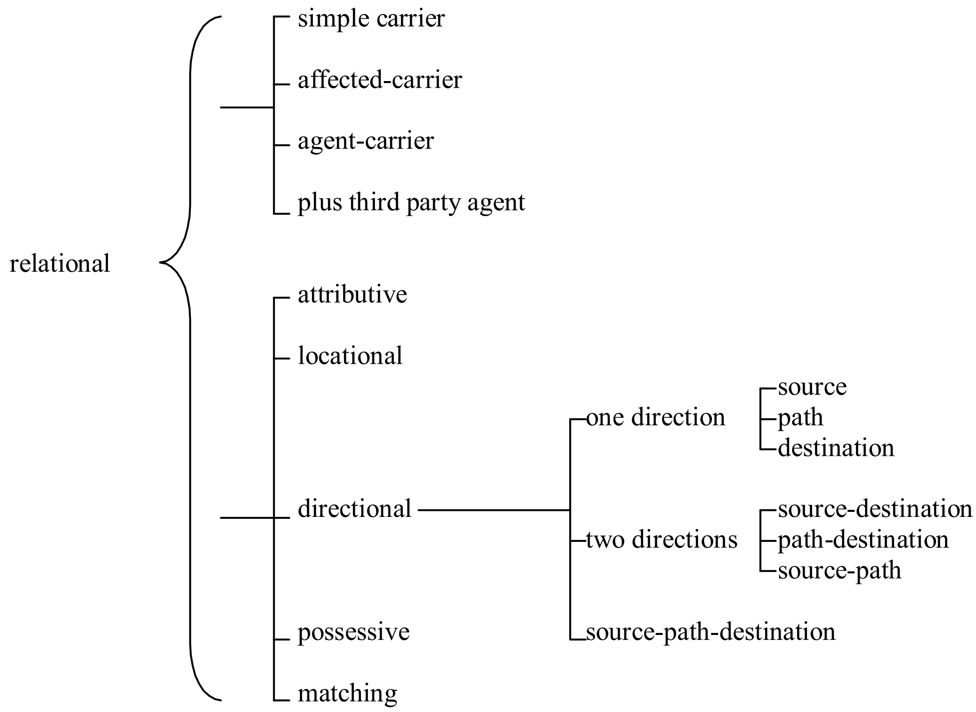

Figure 5.8 The current System Network for Relational Processes in the Cardiff Grammar

5.6 Mental Processes

5.6.1 Overview

Prior to Fawcett's current statement on 'mental' Processes, this area of TRANSITIVITY had been given minimal treatment in the CG literature. In his 1980 publication, Fawcett suggested that the choice [mental] in the TRANSITIVITY system would lead to a system with the following choices:

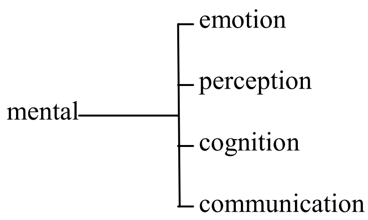

Figure 5.9 Fawcett's 1980 proposal for the system for Mental Processes[54]

Fawcett's only statement in this early publication is that these 'mental' Processes 'typically consist of two inherent roles, but many include the possibility of introducing an additional agent, so making three inherent roles' (Fawcett, 1980:138).

The current 'mental' Process system network is taken from Fawcett (forthcoming)[55] and is presented in Figure 5.10:

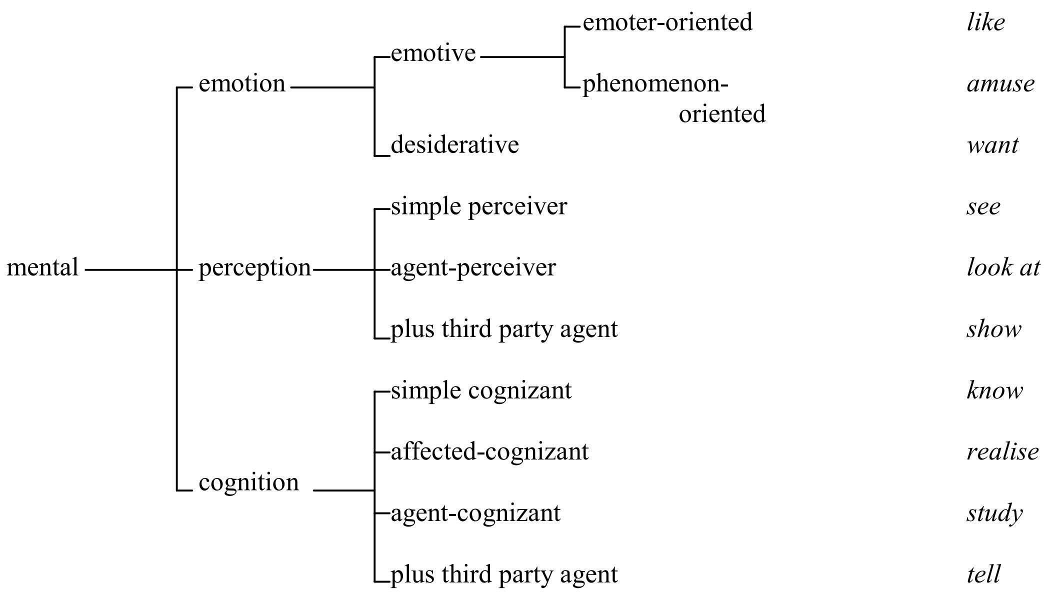

Figure 5.10 'The major options in the 'mental' part of the TRANSITIVITY network' (Fawcett, forthcoming a, Section 3.5).

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[54] His 1973/81 proposal was slightly different to this, with choices of *perception, affective reaction, recognition* and *verbalization* (Fawcett, 1973/81).

[55] The description of 'mental processes' in this Section will be based on Chapter 2, Section 3.5 of Fawcett (forthcoming).

The later parts of this section will describe each subsystem. Firstly, however, since no description of the 'mental' Processes in CG was provided in Chapter 3, it will be useful to indicate how the CG system differs from Halliday (1968, 1970 and 1985/94).

For Halliday, all 'mental' Processes occur with the PR configuration of 'sensor' and 'phenomenon'. The CG, however, proposes that different PRs should be associated with each 'mental' Process type, and offers four separate single PRs; Emoter, Perceiver and Cognizant. The last two can function as compound roles; the Cognizant being conflated with either Agent or Affected and the Perceiver being conflated with Agent. All of these can occur with the fourth PR of Phenomenon. This set of PR configurations allows for a far more delicate semantic specification than Halliday's, and so the analysis is more revealing.

Another difference between Halliday's treatment of this area of the TRANSITIVITY system and the CG is that Fawcett subsumes his own earlier 'communication' Processes (and so Halliday's 'verbal processes') into the CG 'cognition' sub-system. Halliday locates the 'verbal' Processes (e.g. 'say', 'tell', 'demand', 'ask', etc.) in the TRANSITIVITY system at the boundary of two 'principal' Process types. In other words, for Halliday 'verbal' Processes contain aspects of both 'mental' and 'relational' Processes – and he suggests that this is a 'subsidiary' Process type (1995:138).

Halliday also introduces two other 'subsidiary' Process types: the first is the 'behavioural' Processes, and some of the Processes that he analyses as 'behavioural' are considered to be of the type 'mental' in the CG framework. We will discover in Sections 5.6.3 how Fawcett treats 'behavioural' Processes and in Section 5.6.4 what he used to call 'verbalization' (1973/81) or 'communication' (1980) Processes.

5.6.2 Emotion Processes

The first subsystem in Figure 5.10 is that of 'emotion', which leads to a choice between [emotive] and [desiderative]. Within these choices, the [emoter-oriented] option allows for the generation of Processes that convey 'how someone feels about an object or an event' (Fawcett, forthcoming, Chapter 2). In a Process of this type the Emoter will typically be a conscious participant and the Phenomenon may be an object or an event, as these two examples respectively show:

(1) Belle loved her new shoes.

(2) Belle loved meeting Sebastian.

The option [desiderative] involves the same PR configuration as [emoter-oriented] (Em + Ph), and again the Emoter will typically be a conscious participant. 'Desiderative' Processes convey 'the feeling of "desiring" that some event will come about' (Fawcett, forthcoming, Chapter 2), and so the Phenomenon involved will be an event, which, typically, has not yet happened, as in Example (3) and (4a):

(3) Belle wishes she had some new shoes.

(4a) Belle wants new shoes.

Example (4a) is an interesting case. The Phenomenon in this clause – *new shoes* – appears to be a 'thing' realized by a nominal group, but notice that such clauses can be re-expressed as having an embedded clause, as in (4b):

(4b) Belle wants to have new shoes.

This suggests that the Phenomenon that is described is actually an event, which is realized by an embedded clause. This embedded clause contains a 'relational' Process of 'possession'. Thus, the processes of 'wanting', 'wishing for' and 'hoping for' are 'mental' Processes that occur before the stage of 'having'.

The Processes of 'needing' and 'requiring' are more troublesome to account for, as they are a stage closer to 'possession'. Nevertheless, they will be treated as 'mental' Processes that can sometimes be used outside the psychological 'realm'[56] in cases such as:

(5) The course requires you to be bilingual.

(6) You need a maths degree.

[56] See Fawcett, forthcoming, Chapter 2 for his discussion of 'realms'.

The option [phenomenon-oriented] describes Processes where an event or an object provokes certain feelings in an Emoter. For example:

(7) His attitude upsets me.

(8) That he would veto the proposal worried the government.

The ‘phenomenon oriented’ Processes also involve the PRs ‘Phenomenon’ and ‘Emoter’.

A rare type of ‘emotion’ Process that is not included in Figure 5.8 is an [emoter-oriented] type. This has the PR’s ‘affected-emoter’ plus ‘phenomenon’, as in example (9):

(9) Sebastian fell in love with the countryside.

Here, *Sebastian* undergoes a change of state, so that he comes to feel a certain way about an object/event.

5.6.3 Processes of Perception

The CG’s ‘perception’ Processes include a large number of the Processes that Halliday classes as ‘behavioural’. As the name suggests, the Processes that this system generates are those which pertain to the senses, for example ‘looking at’, ‘watching’, ‘listening’, ‘thinking’, ‘smelling’, etc., and as such, they can be agentive or non-agentive, as with the difference between ‘looking at’ and ‘seeing’, and ‘listening to’ and ‘hearing’.

The first possible choice that can be made in this system results in the PR configuration of ‘perceiver’ plus ‘phenomenon’. This allows for the generation of Processes such as ‘noticing’, and also ‘smelling’, but in the non-agentive sense. In other words, the meaning is ‘noticing the smell of something’, rather than ‘causing oneself to smell something’. And the Phenomenon may be an event, as in (10), or an object, and (11):

(10) She noticed that the windows had been cleaned.

(11) I could smell gas.

The next choice of the PR configuration is in contrast with this, as it is agentive: Agent-Perceiver plus Phenomenon. This allows for the generation of deliberate Processes of ‘perception’, and so (10) and (11) contrast with (12) and (13).

(12) She looked at her nice clean windows.
(13) I smelt the daffodil.

The CG ‘mental’ Process system network also models ‘three role’ Processes of ‘perception’, in which someone ‘causes someone to perceive something’. The most obvious example of a ‘three role’, ‘perception’ Process is ‘showing’, as in (14) where the PR’s are ‘agent’ plus ‘affected-perceiver’ plus ‘phenomenon’:

(14) Belle showed Sebastian her nice clean windows.

5.6.4 Cognition Processes

The final subsystem in Figure 5.10 is for ‘cognition’ Processes. This area of the PROCESS TYPE system includes one of the main ways in which the CG framework differs from Halliday, as the CG includes Halliday’s ‘verbal’ Processes in this area of ‘cognition’ Processes. Instead of Halliday’s ‘verbiage’, ‘target’, ‘projected clause’ and ‘paratactically related clause of directed speech or thought’ (Halliday, 1994:141,250), the CG simply recognizes the ‘Agent’ causing the ‘Affected-Cognizant’ to ‘know’ / ‘come to know’ of some ‘Phenomenon’. And so the PR ‘Phenomenon’ contains the speech item, be it realized as an embedded clause or a nominal group, as examples (1) and (2) demonstrate.

Fawcett’s main reason for incorporating these ‘communication’ type Processes in the ‘cognition’ category, and not – following Halliday – by introducing four additional PRs, is because ‘learning the criteria for recognizing four additional PRs … is unnecessary since they can in fact be identified efficiently and insightfully as PRs that are already established in this framework’ (Chapter 2 of Fawcett, forthcoming).

This Process type also accounts for other two-role Processes, most notably the high frequency Processes, ‘knowing’ and ‘remembering’, which involve a simple Cognizant plus a Phenomenon, as in (3) and (4), also the ‘coming to know’ Processes of (5) and (6), which involve an Affected-Cognizant plus a Phenomenon, and the Processes which involve actively going about ‘knowing’, and involve an Agent plus a Phenomenon, as in (7) and (8).

Another possible ‘cognition’ PR configuration involves the role ‘Matchee’, which we first met in Section 5.5.2, and (9) and (10) provide examples of the use of this PR in a mental Process.

(1) Belle asked Sebastian if he loved her.

(2) She told him to go.

(3) I know the area.

(4) Sebastian forgot my birthday again.

(5) I didn't realize you two lived so close.

(6) We learned that he had left.

(7) She studied French.

(8) We will plan a trip abroad.

(9) She matched the material to the colour chart.

(10) He likened the book to his own experience.

It is the Processes involving ‘simple cognizant’ that Fawcett uses to illustrate how the CG treats the complementation patterns that a Process can occur with. The processes ‘know’ and ‘remember’ can each involve a Phenomenon that is realized by either a ‘thing’ or a ‘situation’, and Fawcett’s 1996 paper demonstrates how this is possible. For the purposes of this thesis, we shall not look any further at Complementation patterns, as this is dealt with elsewhere in the literature, for example in Fawcett (1996), and also to some extent by Francis et al (1996).

5.7 Environmental Processes

The CG includes a system for recognizing a referentially limited Process type, but one that is very necessary in a full model of language. This is the system for ‘environmental processes’. These are not only frequent, especially in casual conversation, but they are also constructed in a unique manner.

Figure 5.11 demonstrates that there are two options in the system for environmental processes.

environmental	as process	*rain*
	as attribute	*be sunny*

Figure 5.11 The system for Environmental Processes

The first choice of [as process] enables the generation of weather related verb senses that function as the Process in the clause. The two most obvious examples are *rain* and *snow*, but there are others that provide more specific descriptions, for example, for describing light rain we can say *it's spitting*.

The most interesting point about this Process type is that the Subject has no real world referent. Thus the item *it* is referentially empty. This choice is available in the network and is the only option in the whole TRANSITIVITY system network that involves NO PR's, and allows for the generation of example (1):

(1) It rains (every day).

The second choice in the network also involves an empty Subject. However, this choice does involve one PR: that of Attribute. This option allows for clauses such as example (2), where the Process is very like a 'relational' Process of 'attribution'.

(2) It is sunny.

5.8 Influential Processes

The 'influential' Process section of the TRANSITIVITY system network is a new system in the grammar, and so far the only description of it is that in Fawcett (forthcoming, Chapter 2, Section 3.7). In this chapter I will give an outline of this recently recognized Process type, since it is applied in the analysis and classification of the verbs in the Process Type Database (PTDB)[57].

[57] As will be described in Chapter 7, the PTDB is the base of data for the research presented in this thesis.

Fawcett has formulated the ‘influential’ Process type to model a set of Processes in the grammar that are not accounted for elsewhere in the TRANSITIVITY system. Processes of this type all include an embedded event in the matrix clause that is somehow ‘influenced’ in one way or another by the Process. Figure 5.10 presents the initial choices in the system network.

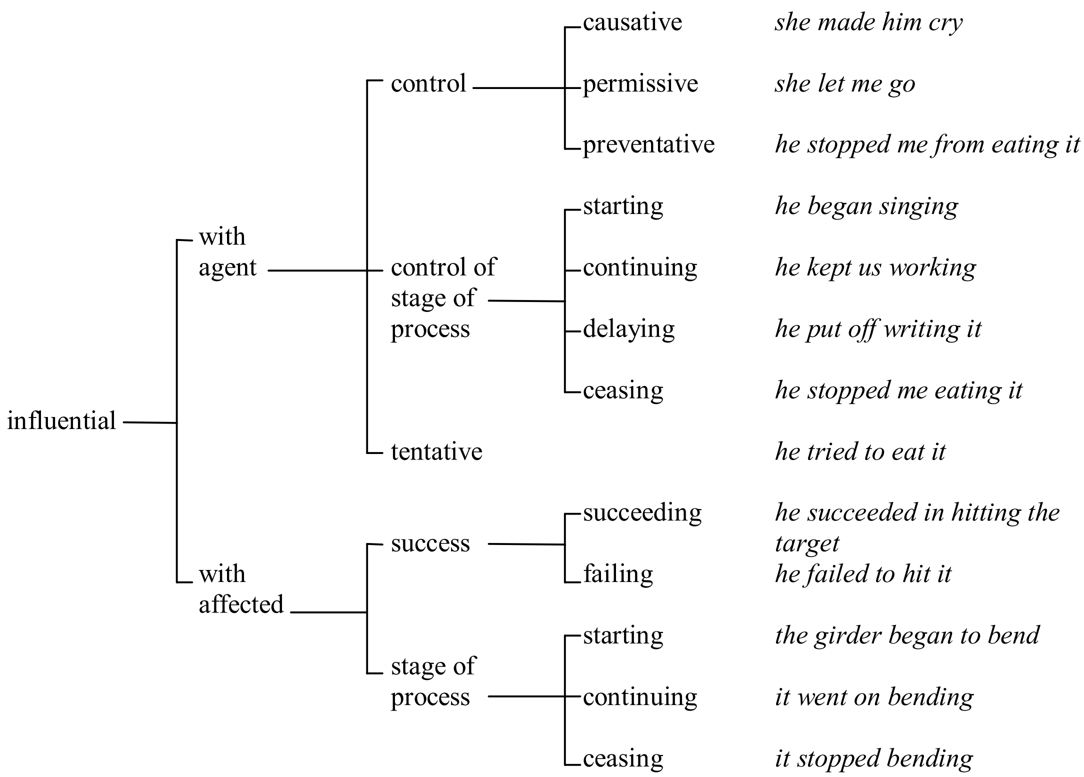

Figure 5.12 ‘Some major options in the ‘influential’ part of the TRANSITIVITY network’ (Fawcett, forthcoming a, Chapter 2, Section 3.7)

As Figure 5.12 shows, there are twelve possible types of ‘influential’ Process. The first choice is between those Processes whose first PR is an Agent and those Processes whose first PR is an Affected. This is an interesting distinction because it means that not all ‘influential’ Processes are ‘causative’ (or rather, ‘instigated’ – i.e. they do not all involve an Agent). For example, in ‘succeeding’ or ‘failing’ in something, the Process is not one that is DONE, but one that HAPPENS TO YOU, and thus the typically first role in Example (1) is an Affected entity.

(1) He failed to hit it.

The second distinction between the twelve possible Processes is whether the typically second PR is a Created or a Range. The PR Created occurs in clauses where the embedded event did not exist until the 'influence' occurred. We met this PR in the 'action' Process network, where it functions with an Agent for a 'thing' that is created, as was shown in Figure 5.4, and is illustrated in example (2):

(2) Belle (Ag) made (Pro) a new lampshade (Cre).

It also functions, though only very rarely, as a 'one role', 'created only' Process as in example (3):

(3) A fight (Cre) erupted (Pro).

In the 'influential' Process system network there is a third use for the PR Created, and this type allows for events to be created, as in example (4):

(4) Belle (Ag) made (Pro) Sebastian cry (Cre).

There are two senses of the PR Created that are associated with 'influential' Processes. The first sense allows for CAUSATION. 'Causation' in the 'influential' system network may be of the overt type, for Processes such as 'making', or it may be used in a weaker sense for Processes of 'permitting' and 'allowing' an event. It may also be used for Processes that are the converse of 'making something happen'; i.e. for 'preventing' an event. The second sense of 'creation' is more closely related to the created entity in the 'action' Process system, and allows for 'bringing something into being', i.e. Processes such as 'starting' an event.

The PR Range occurs where the embedded event extends for the same period of time as the matrix event, and therefore it cannot be AFFECTED by the matrix event (and so is not an 'affected' PR). It is clear that it is not CREATED by the matrix event (and so it is not a 'created' PR), so the CG uses the 'minimally involved' PR of Range for it.

The Range also occurs in the 'action' Process network as presented in Figure 5.4. In the 'influential' Process system network, the Range functions as the semantic label for the embedded event, in an example such as (5):

(5) Belle (Ag) kept (Pro) Sebastian working (Ra)

In his description of the 'influential' Processes, Fawcett states that some 'causation' Processes could be interpreted as 'three role', 'cognition' Processes, in the same way as was described in Section 5.7, e.g. in Example (6):

(6) Belle (Ag) told (Pro) Sebastian (Af-Cog) to go outside (Ph).

However, the processes of 'making', 'forcing', 'allowing' and 'preventing' do not 'explicitly express the meaning of the Process of "communication"' (Fawcett, forthcoming, Chapter 2, Section 3.7), and so do not involve verbal causation, and therefore are 'influential' Processes and not 'cognition' Processes. Thus, this new category of 'influential' Processes shares some characteristics with 'action' Processes, and at one point comes close to one type of 'cognition' Process.

Matthiessen (1995) seems to take the position that Processes that INSTIGATE or AFFECT 'events' are necessarily part of the 'material' Process system. In his 'Lexical spread of verbs serving in Material clauses' (1995:248) his option [creative] leads to a choice between [event] or [thing], and then the [event] option leads to the groupings of [phase-time] (for the verbs 'begin', 'start', 'continue', 'stop', 'discontinue'), of [conation] (for the verbs 'fail', 'start', 'attempt' and 'try') and of [causation] (for the verbs 'cause' and 'bring about'*)*. Interestingly, his grouping of 'created event' Processes does not include the verb 'make', which instead only occurs in the grouping for [created thing]. And this in turn suggests that Matthiessen would recognise the sense of 'make' in example (4) to be a 'created thing'.

In Fawcett's description of 'influential' Processes, he states that 'we could in principle change all of the Created PRs in the 'influential' Processes to Ranges, without affecting the working of the grammar. But it would then fail to recognize the concept of "coming into being".' (Fawcett, forthcoming, Chapter 2, Section 3.7).

However, there is another possible approach that I would like to introduce to the discussion of what the appropriate PRs for 'influential' Processes are. Because the ‘influential’ Processes contain aspects of both ‘action’ and ‘mental’ Processes, I suggest that we could introduce a different PR configuration to capture this, with the typically second PR in the clause being analyzed as either a ‘Phenomenon (Ph) instead of a Range, or a ‘Created-Phenomenon (Cre-Ph)’ instead of a Created. This would avoid the use of the same PR configuration that is used in the ‘action’ Process system. Further, the introduction of a new compound PR of ‘Created-Phenomenon’ can be usefully extended to the ‘mental’ Process system for Processes such as ‘thinking up’ and ‘devising’, where something is brought into being as the result of a ‘mental’ Process.

5.9 Event-relating processes

The next Process type that we shall consider is the very new ‘event relating’ Processes. This new addition to the CG TRANSITIVITY system is described by Fawcett as ‘work in progress’. The account that I will give is therefore based on Fawcett (forthcoming) and is somewhat limited.

Fawcett points out that these Processes are a relatively new phenomenon in the language. They are originally Processes whose meaning has been extended through **metaphor** to relate two events to each other. This is the way that Halliday deals with them – as grammatical metaphor – meaning that he must provide both a ‘congruent’ and an ‘incongruent’ analysis for such occurrences.

However, Fawcett proposes that they should be analyzed as a separate Process type, suggesting that ‘there is no longer any semantic connection with (their) historical origin’ (forthcoming). Further, and perhaps more importantly, Fawcett recognizes that when these verbs are used in their ‘event relating’ sense, the PR configurations are different to what Halliday would recognize to be their ‘congruent’ realization. Fawcett uses the example ‘lead to’, which is a ‘three role’, ‘directional’ Process, as example (1) shows:

(1) Belle (Ag) led (Pro) Sebastian (Af-Ca) to the river (Des).

The sense of ‘lead to’ as ‘event relating’ Process, however, must be analyzed differently from this. The reasons that Fawcett proposes for this are (i) that the ‘event relating’ type has only two PRs and (ii) that the PRs do not pass the tests for the ‘three role', 'directional' type. These reasons justify recognizing a new Process type category of 'event relating' Processes, rather than these senses being metaphorised senses of a 'congruent' sense.

Figure 5.13 presents the full system network that Fawcett (forthcoming) proposes for this new type of Process type.

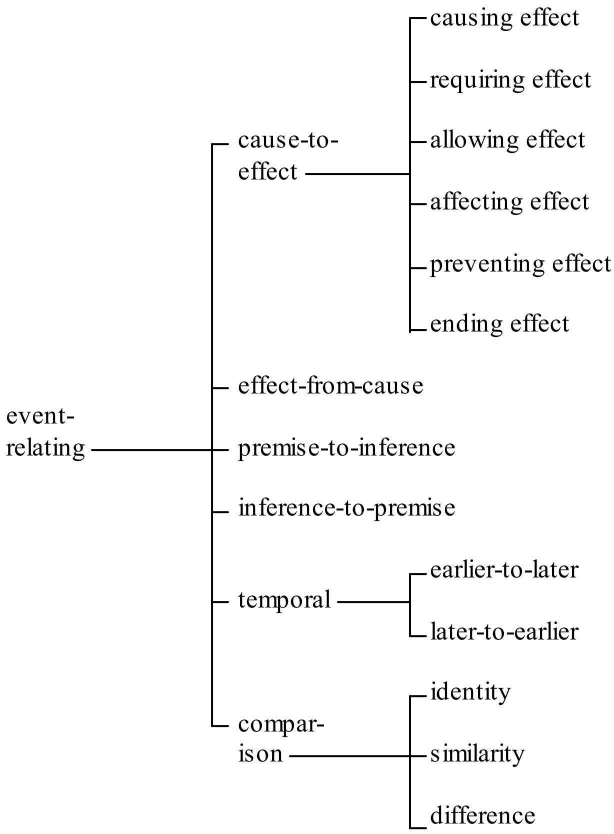

Figure 5.13 'Some major options in the 'event-relating' part of the TRANSITIVITY network.' (Fawcett, forthcoming a, Chapter 2, Section 3.8)

5.10 Conclusion

This chapter has shown how each of the main areas of TRANSITIVITY have been given detailed consideration in the CG, in an attempt to account satisfactorily for all the relevant aspects of meaning. In particular, we have seen that each area of semantically related Processes is distinguishable according to its PR configurations and how, therefore, the notion of semantic features in the system network that reflect the names of the PRs that are generated when these are chosen is very important as well as the classification of verb senses. In Chapter 7 I will demonstrate the way in which certain tests for recognising PRs, can be applied to an element in the clause to determine its PR type, and so give us more confidence than is otherwise possible that we have identified a particular PR.

This chapter has been concerned with the current system for TRANSITIVITY in the Cardiff Grammar, and has provided an introductory description of each Process Type. This has illustrated the major changes that have taken place in the network as a whole, and the need for these changes in modelling the output of the experiential strand of meaning in language. This level of detail in the description is needed in order to understand the work on modelling verb senses in the TRANSITIVITY network that is to be presented in Chapters 7 and 8.

Having considered the initial system network for each Process Type in the CG, in Chapter 6 I will describe the generation of (a) the PROCESS TYPE and (b) the PARTICIPANT ROLES and their structural relations to each other in a fully explicit model that can be implemented in a computer.

6: PROCESS TYPE and PARTICIPANT ROLES in a Generative Lexicogrammar

6.1 Introduction

The TRANSITIVITY system network component in the COMMUNAL project is such that it is able to generate a limited number of lexical verbs, and the present thesis builds from this basis. Indeed, one of the goals of the present thesis is to provide the system networks for COMMUNAL to generate a comprehensive TRANSITIVITY component. I will therefore use this Chapter to describe what has already been implemented in the computer, so that the system networks proposed in Chapter 8 can be placed within the existing framework. This Chapter will demonstrate firstly how the system network for TRANSITIVITY is modelled in COMMUNAL, and secondly how the operations that were described in Chapter 4 are used to make the system more efficient. Specifically, the focus is on the functioning of the 'same pass' rules and how they enable the modelling of BORDERLINE GRAMMATICALITY.

For each major Process type, the TRANSITIVITY system involves three major subsystems, and this section will examine them in turn. These subsystems are 1) the system of PROCESS TYPE, 2) the system of PARTICIPANT ROLES, and 3) the system of SUBJECT THEME. I shall show, through the presentation of these systems, how it is possible to generate the Main Verb of the clause, the types of associated Participant Role and their realizations, and select a PR to function as the Subject Theme.

This description will takes us through the system network for TRANSITIVITY that will generate 'action' Processes. This has traditionally been seen as the 'central' Process type, and the system presented here will indicate how both the lexical verb and the appropriate Participant Roles are generated.

In Chapter 4 I described how the CG system networks function, and how the various devices enable it to generate appropriately. As you will recall, most devices depend on the use of **probabilities**. The present description of part of the 'action' area of TRANSITIVITY will present examples of the probabilities of one feature occurring over another in the system. This allows the user of the grammar to make a more informed choice when selecting options, but, more importantly, it produces REALISTIC text-sentences when the grammar generates randomly. The features in the system network have numbers next to them that are expressed in percentages to reflect these probabilities of occurrence. On entry into the TRANSITIVITY network, the first portion is as follows:

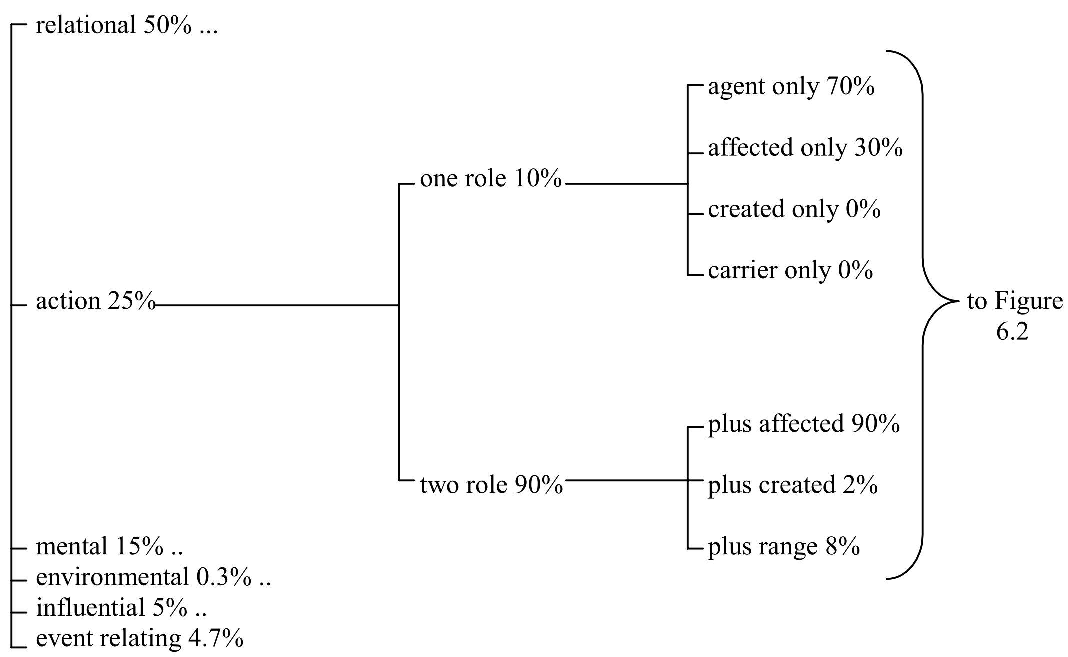

Figure 6.1 On entering the CG TRANSITIVITY system network

The first choices to be made are [action] Process, as opposed to any of the other Process type choices, and then within [action], [two-role] Process rather than [one-role] Process. This means that at a later stage in the network the Process to be generated will require two PRs, which will also need to be generated. The next system network choice determines what 'type' the second role in the clause will be, and here we will choose [plus affected]. The second role will therefore be an Affected, i.e. an entity that will be affected by the Agent 'doing' the Process.

The choice [plus affected] is an entry condition to two sub-networks, and these are entered simultaneously. These are PROCESS TYPE, where the options are realised as lexical verbs, and PARTICIPANT ROLES, where the features generate the semantic roles.

6.1.2 Simultaneity in the system network

These two types of sub-network are entered 'simultaneously', and are marked as such in the network by the convention of having a left hand 'curly' bracket, as we first saw in Section 4.2.4 of Chapter 4[58]:

$$\left\{\begin{array}{l}\text{PROCESS TYPE …}\\ \text{PARTICIPANT ROLES …}\end{array}\right.$$

Figure 6.2 Simultaneity in the CG TRANSITIVITY system network

In terms of the computer model of generation, these systems cannot literally be entered simultaneously. The CG makes use of the originally 'theoretical' fact that the upper sub-network must be entered before the lower so that in the CG a choice in the upper system can reset the probabilities in the lower system. In Section 4.2.4 in Chapter 4 I gave a description of the function of Same Pass (SP) rules, and it is at a point such as this in the system that a SP rule applies. A semantic feature in the first network may have a SP rule attached to it that will change the 'probability figure' of a feature in the second network. Thus, because of this important potential in the network, the PARTICIPANT ROLE network is DEPENDENT on the PROCESS TYPE network. In principle this is only in terms of the practicalities of computer generation, and in principle every 'lower' system network in which such dependencies are found could be made 'dependent' in the standard sense on the rightmost features of the upper network (using a compound 'or' entry condition). But in practice the device is so useful that it has become an established part of the CG model. Indeed, it is satisfying, in a way, to find that the redundant vertical ordering of systems has a value.

[58] It was, in fact, this part of the network that was used in Section 4.2.4 to illustrate the function of Same Pass rules.

6.2 The system of PROCESS TYPE

Our next logical move through the network therefore concerns the PROCESS TYPE network.

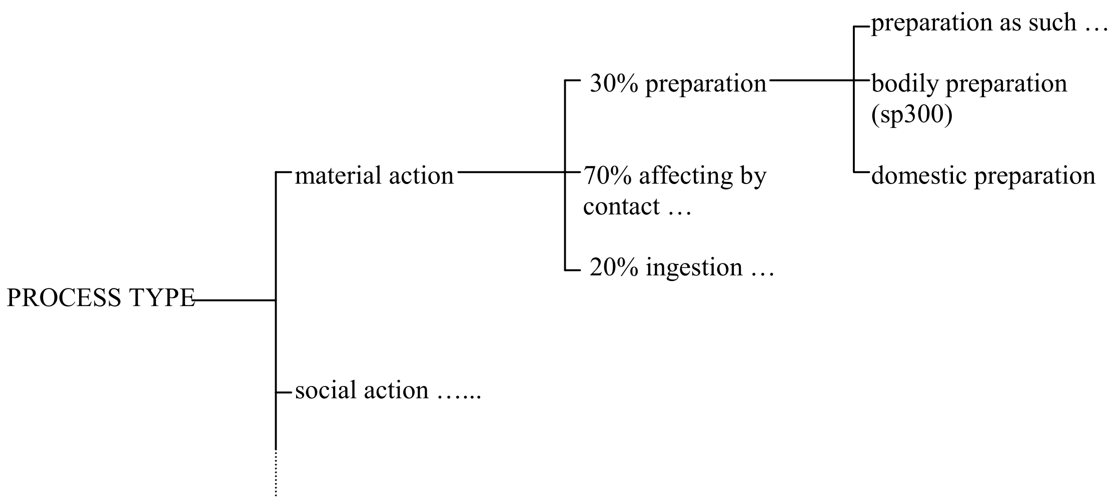

Figure 6.3 The PROCESS TYPE system in the CG TRANSITIVITY system network

This section of the system provides the possibility for generating 'meaning realized in lexis' – i.e. the lexical verb in the clause. In the most recent version of the COMMUNAL grammar the possibilities for choice of lexical verb are still very limited, because the emphasis has been in fine-tuning the effects on structure of a small set of verb senses. Figure 6.3 shows three possible 'material action' types. The choice [preparation] has been added to the network as a result of the present research, and Chapter 8 will show how the area of the network dependent on this feature includes a very large number of frequent 'material action' Processes, and the delicate semantic specification for their generation through the grammar.

For the current purposes, we will make the choice [bodily preparation], which will enable us to make interesting illustrative choices at a later point. On this feature, we find our first SP rule, the function of which was described fully in Section 4.2.4 in Chapter 4. To summarize, this rule specifies a change in probability for the type of Affected role to be generated in terms of whether it is overt or covert. This SP rule is required for [bodily preparation] Processes, because the probabilities for the 'affected' entity need to reflect that there is a higher probability of the 'affected' entity being

COVERT, as in Example (1); i.e. the Affected is generated, but not realised at the level of form.

(1) She showered.

The second reason for having a SP rule here is because there is a higher chance (than there is with other Process types) that the outcome will be a 'reflexive' clause, with the Affected being the same referent as the Agent, and new probabilities need to be assigned to reflect the likelihood of this happening. If [affected is other] is chosen, then the probabilities will remain the same. However, if [affected is self] is selected, then the probabilities must be changed to allow for reflexivity.

This possibility is realised in the network by inserting the following condition into the SP rule[59]:

> if bodily preparation process is chosen, then for the same pass through the network, prefer...
> the features as follows : 20% affected is other, 80% affected is self
>
> and if [affected is self] is chosen, then for the same pass through the network, prefer the choices:
> 10% self is overt, 90% self is covert

Thus the new probabilities on the features result in the following different probabilities in clause types:

(1) 80% I washed this morning (Affected is covert).
(2) 15% I washed myself this morning (Affected is self).
(3) 5% I washed Belle this morning (Affected is other).

The next stage of the network simply provides the choice of types of [bodily preparation].

[59] The condensed form of this rule in the grammar itself is expressed here in natural language.

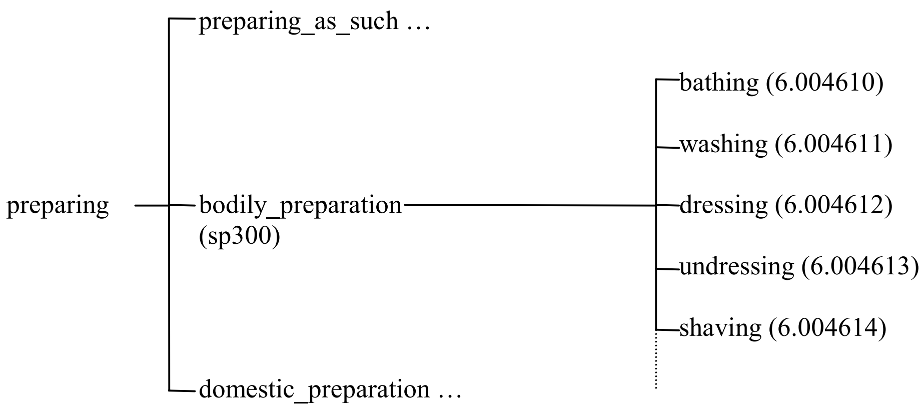

Figure 6.4 A simplified system network for 'preparing'[60]

Here, we will choose [washing]. This means that the realization of the Process type will be the Main Verb expounded by the item 'wash'.

6.3 The system of PARTICIPANT ROLES

Having generated the Main Verb in the PROCESS TYPE system, we now enter the PARTICIPANT ROLE network. In this portion of the TRANSITIVITY system network meanings that are realized in the structure (as opposed to meanings realized in lexis, i.e. the lexical verb) are generated. Here the grammar generates the types of Agent and Affected that are most obviously differentiated from each other in terms of their internal structure (e.g. 'the boy' vs. 'who'), but that are also differentiated from each other in terms of the different clause structures into which they enter. The CG is the only version of SFG that introduces this important system, which is vital to modelling the varying structural probabilities for PRs in clauses. On entering the system for PARTICIPANT ROLES, the network is as follows:

[60] See Chapter 8 for a description of this system network as extended by this research, and see Appendix B for the full system network.

		98% agent unmarked (sp6_23)	e.g. He did it.
		0% agent sought (sp6_24)	e.g. Who did it?
PARTICIPANT ROLES	agent and affected (sp6_2)	0% agent relating out (sp6_25)	e.g. …who did it.
		0% agent exclaimed at (sp6_26)	e.g. What a strong man did it!
		2% agent covert (sp6_27)	e.g. It was done.

Figure 6.5 The initial system for PARTICIPANT ROLES

The examples following each feature illustrate the realization of each choice in the system. And the probabilities are set for the default choice, i.e. [information giver], as we shall see shortly. One of the most influential SP rules (sp6_2) in the network is found in this system. The main purpose of this rule is to model the very different probabilities of whether the 'agent' is 'unmarked' or 'sought'. The probabilities in this system have already been heavily skewed through the choices made in the MOOD network ([information giver] in the case of Figure 6.5). To make this clear we must consider choices that would have been made at an earlier point in the system, and to do this we need to step outside our current pass through the network and CONCEIVE OF this pass as being a later stage in a much fuller traversal of the larger system network – i.e. of the grammar as a whole. Prior to entering the TRANSITIVITY section of the network, choices were made in the MOOD network, and these choices will affect the probabilities in the part of the TRANSITIVITY network being considered here.

The MOOD network is concerned with 'interpersonal' meaning, and so it offers choices on what TYPE of information is to be communicated. The initial probabilities in the present network - the 'default' probabilities - are set for 'information giver' (what is traditionally termed 'declarative') to be the clause type most likely to occur. For the grammar to produce plausible sentences when generating randomly, a SP rule will reset the relevant probabilities throughout the network for whichever choice has been made in MOOD system.

So, at the point we have reached in the TRANSITIVITY system, the SP rule 6_2 on the feature [agent_and_affected] directs us to re-evaluate in the following way. If the default choice of [information giver] has been chosen in the MOOD system, then the probabilities for what type of Agent will be generated are given in Figure 6.5

Three of the options in the network are set at 0% probability, and this is because they cannot be chosen if an 'information giver' is being generated. But if, for example, the clause type [relative situation] has been selected, then [agent relating out] would have become a high probability and the others would have been adapted accordingly. Of course, it is still possible that it is the Affected or a Circumstance that is the 'sought' element.

The choice [agent covert] will ensure the generation of a passive clause. The way in which the lexicogrammar allows us to make this inherent PR covert is by creating an 'agent-less passive' construction. Thus, in this grammar there is only a very low probability of choosing [agent covert] for 'proposals for action', which would typically require an 'agent' and thus an 'active' clause form.

The SP rule re-evaluates possible changes in the probabilities in the following way. If [new content seeker], for example, has been chosen in the MOOD system, then the clause will be, in traditional terms, a wh- 'interrogative' (i.e. seeking new content that will contribute to performer's 'knowledge' about the event), and the probabilities for the agent-type are:

28% agent unmarked	(6) *What did Ivy wash?*
70% agent sought	(7) *Who washed Fred*?
0.2% agent covert	(8) *When was he washed*?

If [proposal for action] has been chosen in the MOOD system, then the final clause will be some kind of 'offer' – and the probabilities for what the agent-type will be are:

99.998% agent unmarked	(9) *Wash him*
0.001% agent sought	(10) *Be washed by who*?
0.001 % agent covert	(11) *Be washed by six o'clock*

In the current pass through the network, we shall assume that [information giver] has been chosen in the MOOD system, and so we shall leave the default probabilities in Figure 6.5 as they are. We shall thus choose [agent unmarked].

So, the function of rule 'sp6_2' is to govern the type of Agent, in terms of both its role in the structure of the clause (as we shall shortly see) and in terms of its internal semantics and structure. These will be realized only on re-entry to the network to generate the nominal group that fills the Agent.

Rule 'sp6_2' has equivalent SP rules that are attached to each different possible PR-type ('unmarked', 'sought', etc), as shown in Figure 6.5, and they operate to guide the generation of an appropriate Affected on the same principles.

In Figure 6.5, the choice [agent unmarked] has the rule 'sp6_23' attached to it. As stated above, the choice [agent unmarked] is most likely to occur if [information giver] has been chosen in the MOOD system. 'Sp6_23' determines that if, however, the choice [new content seeker] has been made (in the MOOD system), and [agent unmarked] is also chosen, then the probability for choosing [affected unmarked] will in fact be only 0.001% likely to occur. The preferred choice will therefore be [affected sought], and so this choice is marked 99.998% probable. Thus, rule 'sp6_23' ensures that if, under random generation, the 'agent' is not 'sought', then the 'affected' is very likely to be.

In this manner the expectations set up by the choice in the MOOD network of [new content seeker] are met. But these new probabilities stop short of making it an ABSOLUTE requirement. This is because the 'sought' element could be neither the 'agent' nor the 'affected', but a Circumstance, as in example (12):

(12) When did she break it?

The next SP rule in the network – sp6_24 – applies if we make the choice [agent sought]. This ensures that if the Agent is 'sought' then the Affected is unlikely to be – though it might be, as in *who hit who?*. More explicitly, this rule determines that if [new content seeker] has been chosen in the MOOD system, the most likely choice for the Affected will be [affected unmarked], with the probabilities on this feature set at 99.989%. Thus the likelihood of occurrence of [affected sought] or [affected covert] is 0.001% and 0.01%, respectively.

The next SP rule is on the choice [agent covert], and is rule 'sp6_27'. This rule determines that if any of the choices [information giver], [polarity seeker] or [confirmation seeker] have been chosen in the MOOD system, then the 'affected' must be unmarked, as in example (13):

(13a) The jeans were washed. (information giver)

(13b) Were the jeans washed? (polarity seeker)

(13c) Weren't the jeans were washed? (confirmation seeker)

If, however, [new content seeker] has been chosen in the MOOD system then the choice of feature will be either '0.001% affected unmarked' or '99.999% affected sought', and so [affected sought] is the most probable, and this will produce a clause such as (14):

(14) Who was washed?

However, although given a very low probability, we must still account for the choice [affected unmarked] where the 'sought' element is a circumstance, so that example (15) might be generated:

(15) When was he washed?

With these rules in mind, we move on to the system for choice of 'affected' entity in the clause. All the possible choices of 'agent' ('unmarked', 'sought', 'relating out', 'exclaimed at' and 'covert') lead into the system in which we choose 'affected' entity. The default probabilities for this system are as follows:

99.989% affected unmarked
0.001% affected sought
0.01% affected covert

The probabilities for [affected covert] are set at 0.01% to allow for the generation of examples such as (16), which might be said of a boxer:

(16) He hits hard.

However, the probabilities of choosing the feature [affected covert] vary depending on what the Process type (or 'verb sense') is, and so the probabilities need to be re-set in this system depending on what choices were made in the PROCESS

TYPE system. Some Process types, such as the choice of [bodily preparation] Processes ('washing' and also 'shaving') are more likely than others (such as 'hitting' and 'kissing') to pre-select a COVERT 'affected' entity. Thus the grammar currently provides different probabilities for (17) (in the sense of 17a and b) and (18) (in the sense of 18a).

(17) He washed.
(17a) He washed himself.
(17b) He washed the dishes.
(18) He hits hard.
(18a) He hits his opponents hard.

Now let us return to the choice to be made for our example. Even though we are generating a Process of 'washing', where the chance of [affected covert] is more probable than with another type of Process, we will let ourselves be governed by the probabilities, and choose the more likely [affected unmarked].

The next type of SP rule is the last to be considered here. It covers the possibility for variation in the probabilities on features in the next system that we shall enter – that of SUBJECT THEME. This rule determines whether the Agent or the Affected will be the Subject Theme. In this pass through the network there is a choice, but if either [agent covert] or [affected covert] had been chosen then this system would not be entered at all, since the overt role will be the Subject Theme by default.

6.4 The system of SUBJECT THEME

If certain options in the systems of MOOD and POLARITY have been chosen, then the probabilities will be skewed. Interestingly, a 'proposal for action' (traditionally an 'imperative') that is passive seems to occur as a 'negative' construction more frequently than is would as a 'positive' proposal for action one, as in example (1). In such cases [affected subject theme] would be chosen.

(1) Don't be caught.

At the point of [affected unmarked], if the choice [proposal for action] and [positive] have been chosen previously, then the probabilities for Subject Theme will be:

99.99% agent subject theme
0.01% affected subject theme

And if [proposal for action] and [negative] have been chosen, then the rule will set the probabilities to:

99.7% agent subject theme
0.3% affected subject theme

This gives a higher likelihood to the Affected being the Subject Theme, thus allowing a passive construction to be generated. The SUBJECT THEME system is, in a sense, the pivotal system of the PARTICIPANT ROLES sub-network. Choice in the SUBJECT THEME system fixes the PLACE in the clause structure of the PR that is conflated with the Subject, and the 'realization rules' attached to the features in this system PLACE these PRs.

Realization rules were discussed in Section 4.2.2 in Chapter 4. Each 'realization rule' governs the outcome of the pass through the network. A 'realization rule' in the SUBJECT THEME system will specify the two different sets of preferences that are to apply on re-entry to the network depending on whether the PR is to be 'unmarked' or 'sought'.

All the choices made in the PARTICIPANT ROLE system lead to the SUBJECT THEME system, which must be entered next. The SUBJECT THEME system is thus said to have **multiple entry conditions**. Within this system there is a 'SP rule' that illustrates how it is possible to provide for cases where the thematization of the Affected must not be allowed. The rule entails that if any of [seeker], [confirmation seeker], or [exclamation] have been chosen and if one of [affected exclaimed at], [proposal for action], [relative situation], [situation with role sought], or [partial dependent situation] are NOT chosen, then [affected not as marked theme] must be chosen. This necessarily complex condition determines that in such cases the Affected that we have generated will not be the Subject Theme in the clause that is eventually produced.

The second section of the rule provides for the interesting fact that there is one case where the thematization of the Affected is obligatory. This is when [exclamation] has been chosen in the MOOD network and [affected exclaimed at] has been chosen in TRANSITIVITY (as described above). This is so that a clause such as (2) can be generated.

(2) What a big ice cream he is eating!

This clause type is actually far more frequent when the Process is one of 'being', which is a 'relational' Process type, as in example (3):

(3) What a clever girl she is!

The next SP rule in the SUBJECT THEME system provides for cases where the thematization of the Agent in a passive construction must not be allowed. If any of [seeker], [confirmation seeker], or [exclamation] are chosen and if any of [agent exclaimed at], [proposal for action], [relative situation], or [situation with role sought] are also chosen, then the 'agent' cannot be the marked theme in the clause.

As with the Affected, the second section of this rule provides for the one case where the thematization of the Agent is obligatory. As before, this is when [exclamation] and [agent exclaimed at] have been chosen. If these conditions are met, then the Agent will be the marked theme in the clause.

In this case, unlike other cases where there is a 'wh'-element, there is no possibility, however formal the register, of choosing a passive marker, plus having the 'agent' as theme. This means that the grammar has been set to generate (4) but not (5):

(4) What a wonderful player you were beaten by!

(5) * By what a wonderful player you were beaten!

6.5 Conclusion

In this chapter we have worked through the system network for TRANSITIVITY to produce the Main Verb in the clause, the associated Participant Roles and their realizations, and to select the Subject Theme, and so determine the structural relationships of PRs to each other and to the Process. In traversing the network for TRANSITIVITY we have recognised how valuable the 'same pass' rules are for generation through a complex lexicogrammatical system, and how these rules allow for the dynamism needed in a network in order to produce 'natural' language.

For each area of the lexicogrammar we have to seek out, often by trial and error, the best possible combination of (1) system network conventions, (2) same pass preference resetting rules, and (3) realization rules, to try to meet three demands that Fawcett (personal communication) has suggested are to be met in model-building of 'elegance, coverage and perspicuity'.

We have also explored the way in which setting probabilities on features in the network enables us to generate various possibilities of language which are 'possible' within the constraints of the language. The great advantage of introducing probabilities to a grammar is that infrequent instances of language are also allowed for, and that what we might call 'dubious grammaticality' is also modelled. In this approach there is no need for the definite exclusion or inclusion of constructions, and the grammar can give guidelines as to the likelihood of occurrence of each possible structure – in relation, where appropriate, to any one lexical item or class of lexical items.

This Chapter has described a pass through the system network for one sub-area of TRANSITIVITY, and this has illustrated how we can capture all the delicate possibilities of this area of language within a single network – so demonstrating economy, perspicuity and elegance, whilst all the time striving towards 'the grammarian's dream: lexis as most delicate grammar' (Halliday, 1961/76:69). This aim is realized by generating the lexis as we work our way through the network.

The two chapters that follow will take up this already very delicate system for TRANSITIVITY and show how I have greatly expanded the delicacy of the system networks that model verb senses – and so their realization in lexical verb forms. It is by building on the framework described in this chapter that I have been able to propose how it is POSSIBLE – and NECESSARY – to extend the TRANSITIVITY networks to incorporate a very large number of verb senses.

In Chapter 7, I will show how this framework has been used for the current research – for the classification of approximately 5,400 verb senses. We shall see that the CG framework has proved to be adequate as a basis for the analysis of this large number of verbs.

7: The Process Type Database (PTDB): its development and application

7.1 Introduction

The previous chapters have been concerned with earlier research on TRANSITIVITY, and in particular with the Cardiff Grammar (CG) approach, since it is the approach adopted for the present research. This chapter will explore the methodology used for creating a new type of database that will ultimately contribute to the CG approach to TRANSITIVITY.

One of the major products of the present research is the resource that has come to be known as the Process Type Database (PTDB). This body of data, which currently models almost 5,400 Process types (i.e. verb senses), is not only the basis for the other aspects of the present research, but it is also a resource that will be available for further development and for consultation by other grammarians and text analysts. The PTDB as it currently stands is presented in Appendix A, but it is a living document, which can be altered as changes in usage occur, and to which new entries can be made. A static description of TRANSITIVITY is only of use to a research project that aims to model a limited representation of language, and this is not the aim of the COMMUNAL project (as described in Chapter 4).

The creation of a database of almost 5,400 verb senses is a considerable task, and this task has occupied a large part of my total research time. It is intended to be a representative list of the most frequently used, and therefore most useful, Process types and their associated Participant Roles (PRs) and, as this chapter will demonstrate, its basis is in text corpora.

This chapter has two parts. The first half will describe the sources and resources used for building the list of Processes included in the PTDB. The second half will then describe how the PTDB has been designed to be a source that can be drawn on for creating the delicate system networks which are presented in Chapter 8. While the PTDB draws significantly on Francis, Hunston and Manning (1996) – the major published description of verbs in recent years – it is essentially complementary to their description in the aspects of verbs that it seeks to cover. The PTDB is concerned primarily with verb senses and only partially, as their realization, with verb forms. The database is concerned with the number and type of associated Participant

Role and the degrees of likelihood that they will be overtly realized and less so with the internal syntax of their PRs. Francis, Hunston and Manning (1996), on the other hand, are more concerned with the patterns that a verb occurs in, and so the internal structure of the arguments that the verb takes rather than the semantics of the argument.

7.2 Using 'corpora' as a research tool

I shall define a corpus as a large body of text instances which has been collected according to defined principles, and which can be examined and queried to assist the researcher in testing hypotheses about language in use. Corpus based linguistics has therefore been popular amongst those interested in observing how language functions in use. Because of this there are close ties between Corpus Linguistics and Systemic Functional Linguistics; one of the central axioms of SFL is the recognition of language as 'meaning potential', and the most productive means for observing meaning 'potential' is through 'instantiation'. By studying instances of language use in corpora the linguist can begin to understand what a language user knows about the language, and how they construct texts. Corpus Linguistics is therefore useful to the present research for determining frequently occurring Processes.

Corpus Linguistics has not always been received enthusiastically in all parts of the linguistic community. There was a 'rationalist' backlash to the empiricism of early corpus linguistics. This was mainly because of the prevalence of Chomskian theory in the 1960's at a time when, as Sinclair (1990:11) states, 'it became fashionable to look inwards to the mind rather than outwards to society' and Chomsky asserted that a corpus representing linguistic 'performance' would be 'a poor mirror of competence' (cited in McEnery and Wilson, 1996:4). However, the growth of ethnomethodological research in the 1970's reinforced the already growing requirement for evidence from real language use to back claims made about language, and since then Corpus Linguistics has become more and more widely used. The first major corpus was produced by Quirk et al in the 'the Survey of English Usage'. This proved to be an important early contribution to the study of language as it occurs, and this corpus provided the evidence on which Quirk et al's two great grammars were built: *The Grammar of Contemporary English* (1972) and *The Comprehensive Grammar of the English Language* (1985).

An important development of Corpus Linguistics as it is known today is the advance in computational methods. Technological progress has enabled more and more texts to be computed, and thus larger and larger bodies of data to be consulted and searched through. This has provided the means for corpora as big as COBUILD's Bank of English, whose most recently published figures stand at 329 million words of analyzed running text (Hunston and Francis, 2000). And the larger the corpus, the more reliable the data, and the more significant the results.

Importantly for the present research, a large corpus does not only provide information on what occurs in language, but we can also derive from it information on the LIKELIHOOD of occurrences of what might occur. Halliday (1991:41) states that a corpus can 'provide evidence of relative frequencies in the grammar, from which can be established the probability profiles of grammatical systems'.

Matthiessen's (1999) *The system of TRANSITIVITY: An exploratory study of text-based profiles*, which we first met in Section 4.2.3 of Chapter 4, looks at the instantiation of transitivity options in language use, and thus provides evidence for how a corpus of data can help to shape a model of language, by providing a 'probability profile for the system of transitivity' (1999:10). Matthiessen states that part of the aim of his study is to 'lead to the formulation of a hypothesis about the relationship between the frequency of instantiation of systemic options and the degree to which they are elaborated in the system of transitivity.' (1999:1). His study involves the creation of a very small corpus, which he refers to as a 'text sample', and which totals 14,500 words. Matthiessen interrogated this text sample for occurrences of the different Process types, and from these occurrences he was able to produce a 'probability profile'[61].

The creation of a new corpus by a single linguist for use as evidence for model building may provide suggestive results, but those results will inevitably be based on a relatively small number of examples. In my view, it is important to make use of the large bodies of text such as those drawn on in this thesis to obtain significant results.

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[61] His results are shown in Figure 4.3 in Chapter 4.

7.2.1 The problems with corpora

Corpora allows us to obtain data about frequencies of occurrence of features in language use, and this is necessary for the production of the 'probabilities' (as described in Chapter 4) which are integral to building a probabilistic model of language. Recognizing probabilities is integral to my research and so this is my reason for using corpus evidence – to determine the frequency of occurrence of verb senses.

However, the use of corpora has its limitations, as I discovered early on in my research. Particularly, the use of computers for the analysis of large bodies of text requires that the analysis be at the level of form, not meaning. And whilst it is beneficial for the corpus not to be 'skewed' by an analyst's idiolect, it also means that the analysis of the corpus can only yield a limited range of data. In Section 7.3.1.1 I shall describe the work of West and his predecessors and associates, and the benefits of consulting a non-computationally-analyzed corpus.

The main problem in achieving information about how frequently verb senses occur is that modern large corpora, such as COBUILDS's Bank of English, are not tagged for verb SENSE distinctions. Therefore, while it is possible to gather every instance of a particular verb FORM in the corpus, a human analyst must then examine each instance of the verb form to determine its verb SENSE. Whilst this is possible for small groups of selected verbs, if one's goal is that of determining the most frequent verb senses being used in the language as a whole, it is a task that is currently impossible to fulfill. And so, it is a fairly straightforward task to obtain probabilities for word FORMS, but it is not easy to obtain probabilities for verb senses, as we would wish to.

A further serious limitation is that corpus searches are limited to single word items[62]. I want my data to incorporate a large and representative number of the very many multi-word verbs that realize Process types – thus reflecting real language use, but so far there are severe limitations in the tools available for investigating 'phrasal', 'prepositional' and 'phrasal-prepositional' verbs from this viewpoint[63].

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[62] It is possible to search for a lemma occurring with another word either side, but this does not produce 'meaningful' results.

[63] The clearest case is the omission of such verbs where the Main Verb is a form of *be* in the COBUILD Dictionary of Phrasal Verbs (1989).

7.3 The 'second level' use of corpora

Pilot studies of individual lexical items at the start of this project led me to recognize the enormity of the task – of obtaining information about a large number of single and multi word verb senses – and so its impossibility. It was at this point that I began to recognize the usefulness of published information about corpora, i.e. of pre-analyzed corpus-based data.

There are huge bodies of corpora that are available to the linguist, and these can be explored for the purpose of providing evidence for various language-related hypotheses. But there are also large bodies of work which provide accounts of what has been found as a result of examining the evidence provided by such corpora, and I would want to suggest that those linguists who are engaged in building descriptions and ultimately theoretical models of language should make more use of such works – as I have in the present project. Thus there is a need for good documentation that reports what is going on in corpora, and it is this that is found as a result of detailed corpus work in publications such as Francis, Hunston and Manning (1996) and the others to have come out of COBUILD. And it is the use of the body of scholarship that I will term the 'second level use of corpora'.

Specifically, I have made 'second level' use of a number of works to produce a very large database of verb senses, and, in this research, this in turn provides the major source for the expansions to the grammar itself that I will present in Chapter 8.

7.3.1 Creating a body of data

Prior to creating the PTDB, several possible sources of data were examined and pilot studies based on these were carried out to determine what the most fruitful base of data would be for the system networks to be built from. What follows here is a description of the main work done to create the body of data that constitutes the PTDB, which has in turn been used to achieve the ultimate aims of the research.

7.3.1.1 The use of West (1953)

The first set of data for building the PTDB was obtained from West's *A General Service List of English Words* (1953). The value of this resource is that it not only provides the frequencies for the most frequent word FORMS; it also provides frequencies for word SENSES. The *General Service List* is able to supply this information because, unlike the works based on current corpus analysis, this early work was carried out by human analysts, who were able to differentiate on semantic grounds between word senses. The importance of West's data to the present study is that it provides a means for accessing probabilities of the occurrence of meanings of the word forms that realize Process types (roughly, 'verb senses'), and this is essential for building system networks that incorporate probabilities. Even today, half a century after the production of the data, McEnery and Wilson (1996:92) state that 'frequency data need not apply solely to word forms: West (1953:108), working with a number of human analysts and an early, non-machine-readable corpus, produced a dictionary of word sense frequencies which have not yet been superseded'. It provides frequency information that can be translated into 'likelihoods of occurrence', which ultimately gives us probabilities of occurrence that can be modelled in the system network. In this section I will describe this unique work, bringing out its limitations as well as its advantages.

The *General Service List* was originally produced as an aid to language teachers, with a view to improving language teaching methodology. West's list is based on the coupling of two previous research projects, the first being the *Interim Report on Vocabulary Selection*, which was produced in 1936 and included a 'General Service List of 2000 Words', and the second being Lorge and Thorndike's (1938) *Semantic Word Count*, which was produced concurrently with the *Interim Report*. West's 1953 publication is the revised and expanded version of these two.

West's main problem was deciding what distinctions in meaning he should recognize. As a publication for the purpose of improving language teaching, West decided that Lorge and Thorndike's *Semantic Count* included too many 'very fine distinctions of meaning' (West, 1953:xi), the introduction of which would hinder the language learner. West therefore grouped these very fine sense distinctions together in his list, in order that 'the teacher and textbook writer may find it easier to understand and use the list' (1953:vii). In view of this fact, it is interesting that the main limitation of West (1953) for the purposes of the present study is its sometimes unclear sense distinctions – a matter that I shall return to in the next section[64].

Figure 7.1 shows an example of what West recognizes to be one sense of the verb 'accept':

ACCEPT, v.	732	(1) (take a thing, person, offer, office)	
			Accept a gift
			Accept £10 for it
			Accept the post of headmaster
50%			

*Figure 7.1 The entry for one sense of **accept** in West 1953.*

This entry tells us that in 5 million words of source material, the word 'accept' occurred 732 times, and in 50% of these occurrences it meant 'taking a thing, person, offer, office'.

The information about 'frequency of occurrence of the different meanings of all multi-meaning words' (West, 1953:xi) comes from Lorge and Thorndike's *Semantic Count*, whose differentiation between meanings is based on the distinctions made in the Oxford English Dictionary (OED). The OED was split into sections of thirty-two pages, and an individual researcher was assigned to each section. The source material for the *Semantic Count* came from 'encyclopedias, magazines, textbooks, novels, essays, biographies, books about science, poetry and the like' (Lorge, cited in West 1953:xi), and the total of the sample was 5 million words. The source material was limited to written texts only, and these written texts are limited registerially.

The methodology used for the production of the *Semantic Count* list of forms and meanings involved each researcher reading the source material and recording every occurrence of any word from their section of the OED. Each record included

[64] It would have been interesting to have access to the original *Semantic Word Count* and the *Interim Report* to discover what their original sense distinctions were, but it was not possible to obtain copies of these.

the item's source, and also its sense according to the OED. Thus, if we refer back to Figure 7.1, we can see that a researcher will have examined all 732 occurrences of 'accept' in the source material, and determined how many occurrences fell into each sense distinction category recognized in the OED.

This human-analytical method is of great interest in the light of the current situation in corpus linguistics, where the analysis of most corpora is automated. Despite the limitations of the data (i.e. the age of the source material, the lack of spoken material, and the sometimes unclear sense distinctions), it has the great advantage over all modern computer based corpora that it provides information about the MEANINGS of the words. A body of data giving semantic frequencies in this way would be even more valuable if it could be updated to include the technological advances that benefit current corpora (i.e. the ability to handle very much larger bodies of text). Unfortunately at the present time judgments about semantic specifications can only be made by a human language user who has experience of contextual knowledge of a lexical item, and can therefore make a decision for each occurrence.

The concept of using the semantic frequencies of lexical items in writing for language teaching materials was embraced by researchers in language teaching. The work that is the most relevant to the present project is Hindmarsh's *Cambridge English Lexicon* (1980) in which the author based his data on West's *General Service List*. At the start of the present research I considered using Hindmarsh as a supplementary source for the classification of word senses, but since its distinctions between meanings appear to be based directly on those in West (1953), it seems clear that this publication has no significant role to play in building the PTDB. In general, the inadequacies in West's categories were echoed in those of Hindmarsh.

The development of the PTDB itself went through several stages. The first version involved a revision of West's data and reworking the verb forms and senses into a spreadsheet. As mentioned above, the *Semantic Count's* OED-based distinctions (and thus those given in West) did not always seem appropriate for modern spoken and written English, and so the transfer of the data into the PTDB was problematic. This led me to explore alternative, more modern sources for semantic distinctions, and so to the corpus-based *Collins COBUILD English Language Dictionary*. The important role of this work in the present project will be described in Section 7.3.1.2.

Nevertheless, West's categories provide the broad base for the PTDB, and I shall now explain how I adapted the figures given in West's *General Service List* for use in the PTDB.

As we have seen, West's data provide percentages for the occurrence of each sense where the percentage is a proportion of occurrence in 5 million words of source material. However, since the database is required (1) to reflect meanings rather than forms and (2) to be as intelligible as possible, I decided that it would be more beneficial for the database user to be able to compare the figures for each word MEANING with each other directly – rather than as a percentage of a word FORM. In the PTDB, therefore, I present first the number of occurrences of the verb FORM in 5 million (the total number of words in the source corpus), and then secondly – and more importantly – the figures for the number of occurrences of each verb SENSE in 5 million words. These figures were calculated from the percentage representation for each word sense. The result of this is that a verb SENSE can be consulted directly in the PTDB. The PTDB is therefore, so far as I am aware, the first database, in either electronic or printed format, that gives as much prominence to meaning as to form.

To summarize: in its original form, West's *General Service List* has a number of problems that make it difficult to use directly as a data resource in this research. However, it was this work that inspired the development of the PTDB in the first place, and wherever possible its semantic distinctions have been adopted in the PTDB – with the result that its figures can be used as the basis for the semantic probabilities assigned in the system networks[65]. However, it has been supplemented and adapted through the employment of further resources, as we shall now see.

7.3.1.2 The use of a corpus-based dictionary (*Collins COBUILD English Dictionary*) for supplementary verb senses

As the above section has demonstrated, West (1953) alone is not a fully adequate base from which to create the PTDB. Luckily, the *Collins COBUILD English Dictionary* (1995) provides a corpus-based account of language use that is both comprehensive and up to date. Written particularly for language learners, it is

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[65] However, I should point out that, in practice, drawing probabilities from West's work was not an easy task.

based on the Bank of English corpus, which, at the time of the (1995) publication of the dictionary, included 250 million words of English usage taken from various spoken and written sources. It is a particularly useful source for the clarification of word senses, as it claims to ‘specialize in presenting the words and phrases that are frequent in everyday use’, and it goes on to state that ‘everything in the book is worth learning for mastery of contemporary English’ (1995:viii). The dictionary therefore contains much useful information for creating a contemporary Systemic Functional model of TRANSITIVITY.

The version of the COBUILD dictionary that I initially used for the purpose of clarifying word senses was the (1987) version, *Collins COBUILD English Language Dictionary*. This dictionary is based on a corpus of 20 million words, and the definitions included are therefore based on a significantly smaller body of data than the 250 million word Bank of English. Furthermore – and importantly for the present research – this (1987) version does not include any frequency information for the word forms included other than what can be inferred from the order of presentation. The more recent (1995) version, *Collins COBUILD English Dictionary*, does include frequency information. More detail of this is provided in Section 7.3.2, as this is the point in the PTDB methodology at which the COBUILD frequency information is utilized. For the purposes of this section of the description, the focus is on the methodology used for supplementing the distinctions between verb senses found in West (1953) and for including examples of usage for each sense.

One might consider that basing the definitions of verb senses on one source (or two if West is included) would provide a one- (or two-) dimensional view of how verbs function in English, and that perhaps we would gain a more comprehensive picture if we were to use sense distinctions from various dictionaries. However, this research project gives greater weight to the corpus-based COBUILD dictionaries than to dictionaries whose distinctions are made according to the judgment (or ‘intuition’) of the lexicographer. In any case, such an approach would run the risk of introducing too many conflicting categorizations. And, in fact, the detailed practical work of the project has shown that the categories in West and COBUILD can be amalgamated relatively easily – thus providing an informal mutual evaluation that is nonetheless impressive.

To explain how the COBUILD dictionary was used, we shall return to the example of the item *accept* (as shown in Figure 7.1 above), but with its second sense also indicated this time.

ACCEPT, v.	732	(1) (take a thing, person, offer, office)		
			Accept a gift	
			Accept £10 for it	
			Accept the post of headmaster	**50%**
		(2) (agree to an idea or belief)		
			Accept the suggestion	
			The accepted opinion	**47%**

*Table 7.1.1 The entry for '**accept'** in West 1953.*

As we have seen, this entry in West reports that there are 732 occurrences of the verb *accept* in the source data of five million words. The verb form is presented as conveying two separate senses, and the description offers percentages for how much of the total figure each sense accounts for. As explained earlier, I transferred this information into an entry in the spreadsheet that became the basis of the first version of the PTDB, and converted the percentages into real figures[66]. However, it was decided that West's treatment of how this verb behaves should be examined further, particularly as he includes, as if it were a typical example, *the accepted opinion*[67].

The next stage was to consult the COBUILD dictionary's entry for *accept*. This entry includes eleven separate senses for the verbal use of *accept*, and Table 7.1 gives corpus examples taken from the COBUILD dictionary for each sense recognized there:

1. Your old clothes will be gratefully accepted by jumble organisers.
2. I do not accept that there is any kind of crisis in British science.
3. Britain's reluctance to accept a proposal for a single European currency.

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[66] See Table 7.2 for the figures.

[67] Here *accept* functions not as a Main Verb in a full Clause, but as a highly restricted clause (termed a 'truncated' clause in Fawcett 2001a) that fills a modifier in a nominal group.

4. People will accept suffering that can be shown to lead to a greater good.
5. Cheques can only be accepted up to the value guaranteed on the card.
6. Should the British army accept gays?
7. Stephen Smith was accepted into the family like an adopted brother.
8. The company cannot accept responsibility for loss or damage.
9. An older man would never accept orders from a younger woman.
10. …drugs which will fool the body into accepting transplants.
11. The telephone booths accept 10 and 20 pence coins.

Table 7.1 The eleven COBUILD Dictionary senses for 'accept'.

This set of eleven supposedly different senses of 'accept' illustrates the very detailed treatment of lexical items given in COBUILD, based on how a word behaves in a large body of texts. The next stage in developing the PTDB involved a close inspection of the COBUILD treatment, in order to determine how many senses of *accept* need to be modelled in the representation of the TRANSITIVITY system.[68]

In the case of the verb *accept*, the final decision for what should be included in the PTDB was as follows:

FORM	Occurrence of form	MEANING	Occurrence in 5 million	Cardiff Grammar Feature	Participant Role Configuration
Accept	732	receive (a gift/ offer/ advice/ story/ fact; your clothes will be gratefully accepted by jumble sale organisers)	366	possessive, agent carrier	Ag-Ca + Pos + Af-Ca
		agree (document/ plan/ piece of work/ blame; I do not accept that there is any kind of crisis in British science)	344	cognition, agent cognizant	Ag-Cog + Ph

[68] Interestingly in the present example (as in many others), a detailed examination of the COBUILD dictionary examples indicated that a lot of the examples are passive. The editors of COBUILD state in their introduction that the examples are 'chosen carefully to show the patterns that are frequently found alongside a word or phrase' (1995:ix). This in turn suggests that passive constructions are more frequent in the corpus evidence of language use drawn on in the COBUILD project than is usually thought, and although this finding is not immediately relevant to this research, it is worth noting.

		accept as member/ into group (should the British Army accept gays? / Stephen Smith was accepted into the family like an adopted brother)		location, plus 3 p Ag	Ag + Af-Ca + Loc

Table 7.2 The entry for 'accept' in the PTDB

In Table 7.2 the eleven senses proposed in the COBUILD dictionary have been condensed into just three separate verb senses, each corresponding to a different TRANSITIVITY analysis. It may appear strange that the large number of senses proposed by COBUILD have been reduced in this way, when the purpose of consulting the dictionary was precisely to determine the number of sense distinctions that is needed. But most of the eleven COBUILD senses reflect very fine semantic distinctions that relate more to the internal characteristics of the Participants involved in the Process than to the Process itself. For example, the first sense of 'accept' in Table 7.2 corresponds to Examples (1), (3), (4), (5), (9), (10) and (11) in Table 7.1. The same Participant Roles are needed, whether the acceptance occurs in the 'physical' realm as in (1) and (5), or in the 'psychological' realm as in (4), or in the 'social' realm as in (9). The value of consulting COBUILD is shown by the addition of a THIRD sense in Table 7.2 over the senses in West, i.e. those that correspond to Examples (6) and (7)[69].

As you can see, the PTDB includes both a 'gloss' of the meaning of the verb AND an example of its usage. An example illustrates the main senses as they are used in context, and this proves to be important as an aid when analyzing the Process type and Participant Role configuration for each sense (which is described in Section 7.6). It should be emphasized that the reason for the use of a dictionary for exploring the various word senses was not to enable me to base the classification on the dictionary DEFINITIONS, although some lexical research has attempted to do this (e.g. Faber and Mairal Uson (1999)), in order to construct lexical hierarchies. My purpose was to ensure that I considered all possible meanings that might be relevant to modelling a system network for TRANSITIVITY – a network that is defined primarily by the Participant Roles that occur with each Process type. The method of working involved

[69] This goes to show just how troublesome word sense disambiguation is, and how we have to rely on fairly informal criteria to determine word senses.

a great deal of individual work on my part, with regular sessions with Professor Fawcett to discuss problem cases.

By applying this method of using the COBUILD dictionary to all the verbs, I have been able to develop the PTDB to the point where it contains a very large number of verb senses, with a particularly thorough coverage of frequent verbs (i.e. those that receive a four and five diamond rating in Francis, Hunston and Manning (1996), for which see the next section). However, Section 7.5 describes how we need to consider not only simple, one-item verbs that predominate in most studies to date but also the senses of multi-word verbs. The inclusion of frequent multi-word verbs as well as one-word verbs brings the total number of word senses in the PTDB at the time of writing to a little under 5,400.

7.3.1.3 The use of Francis, Hunston and Manning (1996), *COBUILD Grammar Patterns 1: Verbs*

As we have seen, West (1953) is unique in providing information relating to the occurrence of different word senses in a body of data. However, in the course of my research a further source of information on the frequency of verbs became available. This is the Francis, Hunston and Manning (1996). Its main advantage is that it reflects late 20th century usage, but it has the disadvantage for my goals of all corpus-based work so far, in that the frequencies it provides are at the level of form, not meaning.

As I have said, the method for research that I have termed the ‘second level use of corpora’ has not been widely used so far. For research that requires a large body of evidence this method is particularly beneficial, since it enables the researcher to use corpus based results without having to trawl through a large corpus for every item to make judgments on. For research such as that presented in this thesis – which seeks to model a very large number of verbs – accessing data directly from a corpus is impractical, and also unnecessary as the required information is attainable through the second level use of corpora.

As one of the main corpus projects at the present time, COBUILD has been the basis of a number of recent publications that are based on the analysis of a very large corpus. These publications provide information which not only serves as a large body of manuals for language learning and teaching but also as a source of information which can be used for the ‘second level use of corpora’.

Francis, Hunston and Manning (1996)’s *Grammar Patterns* is intended as an aid for the teaching and learning of the verb patterns that occur in English, and it describes the patterning of over 4,000 verb forms. It assumes a minimal description of grammar, centred around word-classes, but extending in places to the co-occurrency of classes of groups and of clauses. This resource provides a verb index with a frequency classification, and it is this that gives us the frequencies of verbs in this very large corpus. The classification consists of six bands, and each verb that is considered falls into one of the band areas. Susan Hunston has provided me with the figure boundaries for each band (personal communication), and this in turn has enabled me to determine some real figures for the verb forms[70]. The frequency classification is given in the form of an index, and the band boundaries are as follows:

Band 5 -	32,886	-	upwards
Band 4 -	11,216	-	32,885
Band 3 -	4,498	-	11,215
Band 2 -	1,395	-	4,497
Band 1 -	232	-	1,394
Band 0 -	0	-	231

Table 7.3 COBUILD’s frequency bands.

I added this information to the PTDB so that each entry for a verb form includes a COBUILD ‘band’ reference that indicates its frequency of occurrence in the COBUILD corpus. I also added the actual figure of occurrence for all of the band five (thus, high frequency) verb forms[71]. Thus the PTDB has not only the West figures for occurrence, but also frequencies from the more recently produced COBUILD documentation.

[70] I am indebted to Dr Hunston at Birmingham University for this information.

[71] This information was provided by Ball (forthcoming).

The main limitation of the information obtained from this COBUILD source is that these figures refer only to occurrences of verb FORMS. Whereas West's data, which is based on a relatively small body of source material, was able to provide frequencies for word senses by using human analysts, this much larger and statistically significant corpus of language is necessarily limited to automated analytic tools that cannot recognize semantic differences.

This continues to be a problem of using corpus evidence for research that is at the level of meaning, and the determination of MEANINGFUL frequencies is a task that, at the present time, can still only be reliably undertaken by a human analyst. Corpus searches conducted as a pilot to the present research have proved that the corpus-based differentiation of verb senses for even the most frequent verb forms – those in band five – would be too large a project for a single researcher working on a three year project.

The information on frequency given in the Francis, Hunston and Manning (1996) differs from that given in the *Collins COBUILD English Dictionary* (1995) (as discussed in Section 7.2), in that the banding in the *Grammar Patterns* publication is concerned only with VERB forms, whilst the bands given in the dictionary incorporate ALL word forms. Thus, the frequency classification provided in the dictionary does not distinguish between the number of nouns and the number of verbs. For example, in the dictionary the entry for 'act' is placed in band five (most frequent), but in addition to its seven verbal senses it also has five nominal senses. In Francis, Hunston and Manning, however, the frequency classification is altered to reflect its verbal usage only, and so 'act' is given only a band four classification. Thus the *Grammar Patterns* gives more relevant information for the present project.

The COBUILD classification indicates that there are 134 verbs in band five. These 134 verbs are therefore the most frequent verbs – at least, the most frequent one-word verbs at the level of form – in a very large corpus. Interestingly, the majority of these verb forms were already in place in the PTDB before consultation of Francis, Hunston and Manning, having been included as a result of consulting West's *General Service List* (which is based, as we have seen, on a much smaller corpus of 5 million words of early 20th century written material). It is interesting to note, then, that the most frequently used one-word verbs in English appear to have remained constant for the last fifty years.

7.4 Everyday text observation and native language user intuition as supplementary sources for the PTDB

The publications described so far in this chapter are not the only sources used for building the list of Processes to be included in the PTDB.

The conventions of the field of corpus linguistics require that only information derived from the corpus should be employed as evidence for statements about language phenomena. However, I have found that in practice I have needed to supplement these sources in order to construct a genuinely useful database by the observation of natural language texts in everyday life. This has been especially important to ensure that multi-word verbs, which occur most frequently in spoken language are adequately represented. I have therefore drawn on other sources in the construction of the PTDB – including suggestions from colleagues and data from the speech of non-linguists – for verb forms and verb senses. The inevitable side effect of this attempt to provide a more complete list of Process types is that the frequency of occurrence of some items is not included. This is unavoidable once we broaden the basis for inclusion to include informal ethnomethodological inquiry.

7.5 Multi-word verbs

I decided very early on in the research that a large number of multi-word verbs should be included in the data, since multi-word verbs constitute a large number of the most frequently used expressions of Processes in English. In many influential studies of verbs in English the focus is entirely – or almost entirely – on what we shall call ‘one-word’ verbs; for example, Faber and Mairal Uson (1999); Fellbaum (1998); Hasan (1987); Levin, (1993). The inevitable result is that multi-word verbs are not given the central place in English usage that they in fact have. Moreover, in research where they are included, the information about their frequencies of occurrence is not given. For example, Francis, Hunston and Manning (1996) only include frequency information for single word verbs – the reason being, presumably, that it is a complex task to recognize multi-word verbs using current corpus analysis techniques. For the present research I have taken steps to include multi-word verbs in the PTDB, thus recognizing their central importance in the TRANSITIVITY of English, and the following part of this chapter describes how I went about ensuring that the PTDB includes both the most frequent and also a representable number.

Firstly we must determine what is to be included in the term ‘multi-word verb’. Quirk et al’s (1985) description provides a useful starting point, and I would agree that:

> ‘the main categories of multi-word verbs consist of such combinations as *drink up*, *dispose of* and *get away with* which … come under the headings of PHRASAL VERB, PREPOSITIONAL VERB and PHRASAL-PREPOSITIONAL VERB respectively’ (1985:1150).

Quirk et al then go on to describe a multi-word verb as a ‘unit which behaves to some extent either lexically or syntactically as a single verb’ (1985:1150). In Systemic Functional terms, we may say that a multi-word verb serves the semantic function of **PROCESS** in the clause. However, the Cardiff Grammar extends the meaning of ‘multi-word verb’ considerably beyond this, as we shall see.

7.5.1 Treatment of Multi-Word Verbs in the Cardiff Grammar

A ‘multi-word verb’ functions as the Process in a clause, but as such it has multi components, which must be provided for in the Cardiff Grammar analysis. In the case of ‘phrasal verbs’ the CG recognizes the Process to include a Main Verb, and also a ‘Main Verb Extension’ (MEx), and both of these elements realize the Process – or rather, at the level of semantics, the **Process** (Pro) and the **Process Extension** (PrEx). Example (1) demonstrates the CG analysis:

	S/Ag	M/Pro	MEx/PrEx	C/Af
(1)	Belle	broke	up	the fight.

In the case of ‘prepositional verbs’, the preposition occurs in the prepositional group that fills the Complement in the Clause, as in Example (2):

	S/Ag	M/Pro	C/Af
(2)	Belle	cares	for (preposition) her mother (completive).

There is a further type of multi-word verb that the CG recognizes. As well as ‘phrasal verbs’, ‘prepositional verbs’ and also ‘phrasal-prepositional verbs’ functioning as the Main verb plus ‘Main Verb Extension’, Fawcett (forthcoming) demonstrates how the MEx can be realized by a nominal group, as in Example (3):

	S/Ag	M/Pro	C/Af	MEx/PrEx
(3)	Belle	gave	Sebastian	a kiss.

Fawcett terms this nominal group functioning as MEx in a ‘reified process’, because the Process is realized as a ‘thing’ and – through what was originally a metaphor, (a notion to which we will return later in the chapter) – it is ‘reified’ as a nominal group. The ‘thing’ is recognized as a MEx (and so a PrEx) because it functions with the Main verb to realize the PROCESS. Compare (4):

	S/Ag	M/Pro	C/Af
(4)	Belle	kissed	Sebastian.

The ‘reified process’ may at first appear to be in some respects like the Participant Role of ‘Range’, as it is an ‘event thing’, and also it can become the Subject Theme. This is the analysis that Halliday (1985/94) provides. He in fact uses the term ‘Range’ to describe two different types of phenomena in the clause. Firstly, he uses the term ‘Range’ to describe a Participant such as *the mountain* in Example (5), which is what the CG also recognizes to be a Range. As Halliday states, *the mountain* is ‘an entity which exists independently of the process … Mountains exist whether anyone climbs them or not; but *the mountain* specifies the range of Mary’s climbing’ (1994:146).

(5) Mary climbed the mountain.

Secondly, he uses the term Range to describe something that is part of the Process. For example, *playing tennis*, *singing a song*, etc. Again, this is the same analysis as the CG.

However, Halliday extends the use of ‘Range’ even further to describe occurrences of nominal groups with ‘lexically empty’ verbs in clauses such as Example (6):

(6) Sebastian had a bath.

He rightly states that 'the process of the clause is expressed only by the noun functioning as Range.' (1994:147).

But Fawcett argues – and I tend to agree – that it is advisable to limit the use of the terms 'Range' to phenomena which exist in their own right in the world, i.e. '[A Range] has an existence outside the particular event that is being reported' (Fawcett, forthcoming, Chapter 2, Section 1.5). And instead, Fawcett recognizes that a 'reified process' – such as *a kiss* in the Example (3), *a bath* in Example (6), or *a glimpse* in Example (7) – actually IS the Process.

(7) He caught a glimpse of her running across the platform.

In analyzing the Processes in the PTDB I needed to be aware of all the possible structures that can function as MEx in the clause. A particular example of how this can be troublesome in analysis is the idiomatic Process of 'taking a plane to somewhere'. This was troublesome because 'taking a plane' functions like a 'directional' Process of 'going somewhere', where (8) is equivalent to (9):

(8) Sebastian took the next plane to Glasgow.

(9) Sebastian flew to Glasgow.

This idiomatic use of 'taking' might at first lead one to believe that the Process involved three roles. However, (8) is not equivalent to the three role directional process in example (10):

(10) Sebastian took a parcel to Glasgow.

In fact, 'taking a plane to somewhere' is a multi-word Process that involves a reified process. The analysis is therefore as in Example (8a):

	S/Ag	M/Pro	MEx/PrEx	C/Des
(8a)	Sebastian	took	the next plane	to Glasgow.

7.5.2 Obtaining multi-word verbs from corpora

Multi-word verbs are highly frequent items, especially in spoken language, and so should be included and modelled in a system network for TRANSITIVITY that claims to be comprehensive in its coverage. As Halliday (1994:208) states, 'typically [multi-word verbs] have non-phrasal, one-word synonyms … yet the phrasal form tends to be preferred, and is strongly favoured in the spoken language.'

To produce some evidence for the high occurrence of multi-word verbs in texts, I undertook a small scale project in which I hypothesised that the two high frequency items 'pull' and 'push' (which are band four frequency in COBUILD'S classification) would occur regularly as multi-word verbs. Using the British National Corpus (BNC) online I looked up these items, and in a sample of fifty lines of corpus examples, that I analyzed manually, the results were as follows[72]:

VERB	MULTI-WORD VERBS	One Word Verb	Noun	Idiom
Pull	72%	6%	12%	10%
Push	54%	26%	20%	0%

Table 7.4 The analysis of the items 'pull' and 'push' in a sample of 50 lines from the BNC

The results of this corpus search show how a random selection of occurrences of these high frequency items provides evidence that they are much more likely to occur as multi-word verbs than as single word verbs. It is consequently important that the multi-word verb senses of *push* and *pull* are given a central place in a model of TRANSITIVITY.

While these results are based on a very limited source, the message is startlingly clear. Moreover, this study brings out a second major problem in accessing information about verb senses from large bodies of corpora. Fifty lines of text are relatively easy to search through to draw out examples, whereas a search of the individual functioning of lexical items in a much larger corpus – which would provide much more reliable results – would be an impossible task to undertake. This

[72] Fifty is the number of lines of random corpora that can be accessed from the BNC online.

substantiates my point that information on the frequency of multi-word verbs is not simple to access, whether by a human searcher of a corpus or by using an automated corpus. Typical automated corpus searches for multi-word verbs involve stating a headword, and initiating a search that allows a 'span' of up to five words between the headword and the possible co-occurring item. But the results that this type of search provides are not instances of multi-word verbs; they are merely instances of co-occurrences of two items in a string of text, and so each occurrence must be examined to determine whether it is functioning as a multi-word verb. This may well be the reason why many studies of verbs in English neglect to provide information on the functioning of multi-word verbs.

One source that does include information on the frequency of multi-word verbs is the *Longman Grammar of Spoken and Written English* (Biber et al, 1999), and this has therefore been a valuable resource in the compilation of the PTDB. The information that Biber et al include on the frequency of multi-word verbs distinguishes between 'phrasal', 'prepositional', and 'phrasal-prepositional' verbs, and their frequency information is taken from corpus occurrences of one million words.

Biber et al found that the multi-word verb 'go on' was the most common phrasal verb in the whole of the corpus[73], and that the multi-word verb 'come on' was the most common phrasal verb in the conversation section of the corpus, occurring 420 times in one million words. The most common prepositional verb was 'look at', occurring 880 times in one million words of corpora, and the most common phrasal-prepositional verb was 'get out of', occurring 90 times in one million words. Biber et al present 130 multi-word verbs in total for which they give occurrences in one million. All of these 130 have been included in the PTDB along with the frequency information of each.

[73] No figures are given by Biber et al for this multi-word verb.

7.5.3 Incorporating Multi-Word Verbs in the PTDB

In order to include what might be considered a representative number of multi-word verbs in the PTDB, I drew on various resources to produce a list of high frequency multi-word verb senses. I will now describe these.

West (1953) includes a small number of instances of multi-word verbs. Surprisingly, however, he does not divide single-word and multi-word verbs into separate senses, including all the occurrences of multi-word verbs as entries in the list under the HEAD verb. For example, he recognizes the verb 'bring' as is shown in Figure 7.2:

BRING, v	2547 occurrences in 5 million		
(1)	(*carry, convey*)		
	Bring me the book		
	Bring your friend to the party		**54%**
(2)	(cause to reach a certain state)		
	Bring to an end		
	Bring into action		**9%**
(3)	(special uses:)		
	Bring back	(3.5%)	
	Bring on (young plants)	(0.7%)	
	Bring out (details more)	(1,1%)	
	Bring out (a new book)	(1.1%)	
	Bring up (a question)	(0.5%)	
	Bring up (a child)	(2.2%)	**9.1%**
	Bring about	(8.3%)	
	Bring forth	(1.4)	

Figure 7.2 West's entry for the verb 'bring'

Ideally, the last categories in this entry, i.e. those functioning as multi-word verbs, would each be entered as separate verb types.

To obtain the true figures for the multi-word verbs included in West, I developed the following method. All the multi-word verbs to which West assigns a figure of over 10% are included in the PTDB as separate entries. However, this did not provide the PTDB with a very high number of multi-word verbs – certainly not enough for a representative account of TRANSITIVITY. I therefore consulted a number of other sources, from which I developed a list of sixty-eight single word Processes which frequently combine with items such as *in, out, on, off*, etc, to form multi-word verbs. The three major sources for these single word Processes were

West (1953), the *COBUILD Dictionary of Phrasal Verbs* (1989) and Fawcett (forthcoming).

From West's *General Service List* (1953) I took the thirty-eight multi-word verbs in the category which had been assigned a figure of 10% or over. This 10% is an arbitrary figure, but using this category provides us with a list of frequently occurring multi-word verbs in the West corpus.

By coincidence, the *COBUILD Dictionary of Phrasal Verbs* (1989) authors also provide a list of thirty-eight common verbs that they maintain occur in a large number of combinations with different 'particles' (1989:vi). Unlike the list in West (1953), this list is not based on the frequency of occurrence of each multi-word verb sense, but instead the list is made up of those one-word verbs that are EXPECTED to frequently occur as the Main Verb in a multi-word verb.

The final source for Processes included in the list of one-word verbs that frequently occur with other lexical items to form multi-word verbs is Fawcett (forthcoming). This source includes what Fawcett recognizes to be highly occurring verbs. His list includes sub-lists of both 'one-role' and 'two-role' Processes that are multi-word verbs. Fawcett's main source is the COBUILD Grammar (Sinclair et al 1990). The Processes he proposes seem to concur with those suggested by West and COBUILD, except that the latter excludes *be*. The full list is as follows:

be
break
bring
burn
buy
call
carry
cast
come
do
draw
drop
fall
fight
fill
get
give
go
hammer
hand
hang
hold
hit
keep
kick
knock
lay
leave
lie
live
look
make
mix
move
pass
play
pull
push
put
run
send
set
shut
shoot
sit
slip
slow
smile
speak
split
spread
spring
stand
stay
stick
sweep
take
talk
tear
throw
tie
touch
turn
use
wash
wear
weigh
wipe

Figure 7.3 A list of sixty-eight single word verbs which regularly combine to be multi-word verbs.

This list combines with the list of frequent words that can occur as MEx in the clause. This list of frequent MExs is as follows: ‘up’, ‘down’, ‘in’, ‘out’, ‘on’, ‘off’, ‘about’, ‘(a)round’, and additionally, with ‘movement’ Processes, ‘inside’ and ‘outside’[74].

I added this list of sixty-eight single word Processes which frequently combine with MExs and / or prepositions to form multi-word verbs to the PTDB, and I then looked each in turn up in the *COBUILD Dictionary of Phrasal Verbs* to ensure full coverage of the sense types. I used this dictionary in the same way that I used the *COBUILD English Dictionary* (1995) (as described in Section 7.3.2) in order to supplement the single word verb senses. I entered into the PTDB all of the MExs and

[74] The source of this list of frequent MExs is Fawcett, in press, Chapter 5.

prepositions that COBUILD recognizes each Process to occur with, plus an example of usage for each. This has meant that close to 800 new multi-word verb senses have been added to the database.

There is one major problem with these new additions. This is that they do not give a true representation of the high frequencies of the multi-word verbs. An example of this is the single word verb *give*. This is very high frequency item, occurring 63,524 in the COBUILD corpus. But the multi-word verb *give off* is (probably) low frequency compared with, for example, the multi-word verb 'come on', which was cited, as we have seen, in Biber et al (1999) as high frequency. Despite the difficulty in assigning probabilities to such verbs, the advantage of including this list in the PTDB is that the database now has a high coverage of multi-word verbs.

The main disadvantage of the *COBUILD Dictionary of Phrasal Verbs* (1989) as a source is that is does not recognize 'be' as a Process that can function as a multi-word verb. Examples such as 'be born', and 'be up', in Examples (1) and (2), suggest that 'be' occurs frequently in conjunction with other words as a multi-word verb, and therefore it should be included in the PTDB.

(1) He was born on July 5th.

(2) I will be up until two tonight.

Instead I consulted both the *Longman Dictionary of Phrasal Verbs* (1983) and the *Longman Grammar of Spoken and Written English* (1999) to determine the multi-word verb senses of 'be' that should be included in the PTDB, as both of these sources provide detailed information for the functioning of 'be' as a multi-word verb.

To summarize this section on multi-word verbs, I have recognized in my research both the need to include multi-word verbs and the fact that it is a major problem to obtain frequencies for them from corpus-based studies. The weaknesses of the 'second level' corpus data described above confirms this. However, it is very important to include them in a system network for TRANSITIVITY that indicates frequencies, as they certainly do occur frequently in language. In order to establish a relatively full coverage in the PTDB I have drawn on the sense distinctions of the *COBUILD Dictionary of Phrasal Verbs* for each multi-word verb derived from the list of sixty-eight single word verbs, and the *Longman Dictionary of Phrasal Verbs* to supplement this in order to provide the multi-word verb occurrences of *be*. Finally, Biber et al's *Longman Grammar of Spoken and Written English* is the only source that publishes lists of multi-word verb frequencies taken from corpus evidence, and I included this frequency information in the PTDB. But these frequencies are at the level of form rather than meaning.

7.6 Assigning Process types and Participant Role configurations to the verb senses in the PTDB

We come now to the most challenging stage in the construction of the PTDB. Since the purpose of producing the PTDB is to formulate a picture of what should be modelled in the production of a representative system network, we need to provide a TRANSITIVITY analysis for each verb sense. A network can then be created from this analysis, into which each verb sense can be placed. In other words, having established a method for acquiring what I believe to be the most frequent verb senses in English, each verb sense in the list must be analyzed according to its Process type and its configuration Participant Roles.

The description of a system network provided in Chapter 3 demonstrated how a system network involves subclassification, and, as we saw in Chapter 5, the first subclassification in the TRANSITIVITY system is the types of Process, as presented in Figure 7.4:

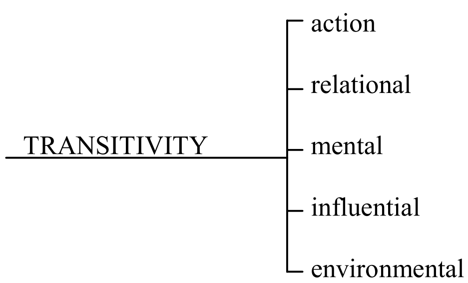

Figure 7.4 The initial subclassification in the system network for TRANSITIVITY

To produce a TRANSITIVITY system that involves further 'delicacy' requires the re-presentation of the list of frequently occurring Processes to include the analysis of the Process types. The ultimate goal for the PTDB is to be transformed from an alphabetical and unrelated list of verb senses into a systemic organisation in the form of a system network, in which the non-terminal features represent choices realized in the presence or absence of PRs. Fundamentally, this is the way in which the system network functions – by grouping semantically related categories through a process of subcategorisation.

Chapter 5 provided a description of each of the Process types in the Cardiff Grammar framework, and the possible Participant Role configurations were presented as choices in the network for each Process type. The networks (presented in Chapter 5 as Figures 5.3, 5.4 and 5.5) reveal that the CG has 17 simple semantically-based Participant Roles that aid the analysis of the Process types, and 10 compound PRs. These networks and their associated PRs are what I have used for creating semantic groupings of the verb senses in the PTDB.

Fawcett states that 'the analysis of Participant Roles is one of the most insightful ways of understanding the view of the world that the producer of a text holds' (Fawcett, forthcoming a, Chapter 2, Section 1.1), and so from this viewpoint the analysis of PRs is crucial to modelling the experiential component of language. To briefly reiterate: a PR is an experiential role which is semantic, and which potentially conflates with the Subject or any possible Complements in the clause, and can also conflate with the completive in a prepositional group.

The probability of a PR being realized in the TEXT varies greatly depending on the Process. The analysis in the PTDB of the PR configuration that a Process occurs with therefore must also involve the possibility and likelihood of a PR in the clause being overt or covert. The PTDB has incorporated this aspect of the analysis by providing the criteria provided in Figure 7.5, and these degrees of probability were devised in conjunction with the research presented in this thesis, and are published in Fawcett (forthcoming, Chapter 2).

(…)	'this element is occasionally unrealized'
((…))	'this element is frequently unrealized'
(((…)))	'this element is almost always unrealized'
(… oblig)	'this element is obligatorily unrealized'
… oblig	'this element is obligatorily realized'

Figure 7.5 The likelihood of the overt or covert realization of a PR in the text.

In Section 7.6.1 a full presentation of the Cardiff Grammar's Participant Roles will be given, and a method for analyzing the TRANSITIVITY of a clause using TESTS for the PR types will be described.

7.6.1 The methodology for analyzing the verb senses in the PTDB

Having determined the frequency information for a great many of the verbs in the PTDB, the most productive method for analysis is to consider the most frequently occurring verbs first. This is because, as Sinclair et al (1995:xiii) state, 'the words in the top two bands [in the COBUILD English Dictionary] account for approximately 75% of English usage – so their importance is obvious'. The PTDB therefore includes an analysis of all of the verbs that fall into band five and band four, but also a great many others.

I decided that the analysis would require consultation with others involved in the CG, as a single perspective would not produce the most conclusive analysis. One particular problem in analysis is that of determining the sometimes fine boundary between Participant Roles and Circumstantial Roles. Section 5.2.2 presented a discussion of how Halliday's framework differs from the Cardiff Grammar in what is considered to be Participant and what is considered to be Circumstance, and it has become clear from my large scale analysis that this is a 'grey' area, and problematic to determine. However, a combination of Fawcett's tests for Participant Roles (see Section 7.6.2), and consultation with Ball (forthcoming) – whose research seeks to provide criteria for recognizing Circumstantial Role types – aided in the determination of Participant Roles.

A further feature of the PTDB is that it includes real text examples, (or examples shortened from real text examples) which proved to be a valuable guide in the analysis. The examples, taken from the COBUILD Dictionary (1995), provide a context in which the Process is involved. It is only possible to determine the TRANSITIVITY analysis of a verb by assessing its occurrence in a number of contexts and with a variety of collocates. Furthermore, by analyzing real corpus examples taken from COBUILD, I was able to test – and in a few cases expand – the Cardiff Grammar as a tool for analyzing the TRANSITIVITY of real instances of language.

I hypothesized that, once the analysis of the most frequent verbs was completed, these frequent types might serve as 'prototypes' for each Process type category, as in Rosch's (1978) theory of categorization for cognitive categories (despite the fact that her theory concerned 'things' rather than 'processes'). I hoped that this might facilitate analysis of further verb senses through the cross-referencing of verbs associated with a prototype. However, this approach to analysis needed to be used with care since the Process type categories do not involve a single superordinate verb sense.

Having analyzed the most frequently occurring verbs in the PTDB, I found that it was not the case that these verbs fulfill a central, or prototypical*,* criterion for a Process type category. In fact, the most frequently occurring verbs tended to be often the hardest to analyze because (a) the present research aims to model verb SENSES, and it is generally the most frequently occurring verb FORMS that seem to have the most senses, and (b) the most frequently occurring verb forms and senses have the most extended meanings, or metaphorical uses, so that they must be 'unpacked' to reach a core meaning[75].

Nevertheless, I found that words from semantically similar domains often involved the same TRANSITIVITY analysis, and this therefore assisted the overall analysis of the PTDB.

7.6.1.2 Using Levin for categorization

Levin's (1993) work and the theory to which she is working have already been considered in Chapter 2. In the present section however, we will consider her description of verb classes as a resource for classification. She provides a list of 3262 verb forms in her 1993 publication, which she has classified according to their semantic relation and grammatical alternation. I applied her verb classes to each verb in the PTDB in the hope that a useful set of categories based on semantic classes might emerge, and the PTDB, as presented in Appendix A, in fact includes a column for Levin's classification of the verbs.

However, Levin's classification has turned out to be of very limited value. One of its most surprising limitations is that Levin does not include some of the verbs

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[75] I will return to this notion in Section 7.6.3.1, where I will consider specific problems in analysis.

that were found to be high frequency in the present research. Of the 134 verbs that COBUILD considers to be highest frequency (band five) there are 13 verbs that Levin does not include[76], and of the 231 verbs that COBUILD considers to be in the next band of frequency (band four), Levin omits 49. The conclusion must therefore be that although she at first appears to have a very broad coverage, with her 3262 verb forms, many of these are low frequency, and the list appears not to be based on a corpus of an adequate size.

Further, on examining Levin's verb classes, I found that various groups of verbs that have the same alternation are not as semantically similar as she claims. At least, they do not have a semantically close fit with the classes of Process type in our system networks, as defined by configurations of PR. It follows, therefore, that her semantic groupings have proved to be much less useful than was hoped, as a source of 'intermediate' features in the system network of Process types.

7.6.2 Using the Cardiff Grammar Participant Role tests for TRANSITIVITY analysis

The most important of the 'tools' provided by Fawcett for analyzing Participant Role types – and thus Process types – is the set of 're-expression tests' for testing each element of structure in the clause to be analyzed. The full set of tests is given in Fawcett, forthcoming a, Chapter 2, Section 4, and is provided in this thesis at Appendix C. Fawcett provides a test for each possible Participant Role. It is important to note that the tests are intended to be guidelines for the analyst, not as absolute rules.

The tests are ways that the clause can be re-expressed that will enlighten the analyst as to the function that is taking place. Fawcett also provides supplementary criteria for recognizing PR types; for example, he states that 'an Agent is typically animate and usually human – but not necessarily, because a wide range of objects have 'creature-like' qualities'.

Fawcett's tests are similar to Halliday's 'probes', which for his Material Processes are the same tests as the CG tests for Agent and Affected, and these are '*What x did to y was to …*' and '*What happened to y was that …*'. One difference

[76] These 13 are: base; be; become; decide; expect; fail; force; involve; let; lose; plan; seem and spend.

between the two frameworks is that Halliday's set of probes is incomplete, while Fawcett provides a full set of tests for the semantic PRs.

7.6.3 Specific problem areas in analyzing the PTDB

Having these tests for Participant Roles means that there is always a document that can be referred to in case of problems in assigning PRs to a Process. However, the tests are not absolute, as I have said, and they have to be interpreted in relation to the most typical use of the Process type. Specifically each clause should first be re-expressed as an active, present tense, information giving clause. Although there is a clear CG framework for Process types, with these re-expression tests as the major 'tool' to aid analysis, the nature of language is such that many analyses are not definitive, and are open to an alternative interpretation. By following a process of consultation with Robin Fawcett and others on doubtful cases, I have been able to build up the entries in the PTDB to a number that is approaching 5,000, with the analysis of most of these being reasonably final, in terms of the CG framework for TRANSITIVITY.

This section of the present chapter discusses particular problems encountered in assigning classification of PRs to the various Process types.

7.6.3.1 The treatment of metaphor and grammatical metaphor in the Process Type DataBase

One aspect of language that needs to be attended to in the analysis of the PTDB is the wealth of 'extended meanings', or metaphors, which are highly prevalent in naturally occurring instances of text. Thibault (1999) talks of the 'hybrid possibilities in experiential construal', and the very use of the term 'hybrid' suggests that any attempt to model such a metaphorical possibility is open to more than one interpretation. However, a model of TRANSITIVITY must necessarily find some terms in which to deal with such phenomena. Although this research does not attempt to produce a definitive account of TRANSITIVITY, it does seek to present the main concepts of an extendable model, and the role of metaphor in historical change must therefore be brought into the picture.

The analysis of metaphorical TRANSITIVITY is problematic; indeed, we might ask whether it should be given a distinct place in the model at all. If we are considering language from the perspective that the way in which it functions will reveal its meanings (which we are), then to presume that a metaphorical meaning (which Halliday would term ‘incongruent’ (1970:149)) is ‘mapped’ onto some typical or CONGRUENT meaning implies that a person using the language performs some type of transformation every time they use a ‘dead’ metaphor, which is to be discussed below. However, some criterion had to be established for how the system will deal with ‘extended meaning’, and therefore this section of the chapter will discuss what I decided to be the best treatment of metaphorical TRANSITIVITY in the PTDB.

Let us consider an example that includes a Process that must have once been a living metaphor, but which is if not ‘dead’ then certainly ‘fading’ (Fawcett, forthcoming a, Chapter 2), and then determine how it might be treated. A frequently used example in discussions of the phenomenon is the metaphorical use of ‘flood’. Halliday (1994:340) states that the clause in Example (1) would be congruently realized by the clause presented in Example (2):

(1) Protests flooded in.

(2) Protests came in in large quantities.

By proposing that Example (2) is the congruent clause, he is suggesting that the types of ‘thing’ that can flood in do not include protests. However, his congruent example should be taken a stage further. He should further include that ‘a protest’ is itself a metaphorized entity in both clauses that requires ‘unpacking’. ‘Things’ that can flood in are typically bodies of water, but it is equally true that ‘things’ that come in are typically human conscious agents – and not protests. Through the use of grammatical metaphor, an event of ‘protesting’ has been nominalized and is represented as an EVENT noun. It can then function as a Participant in another Process – in these examples, coming in or flooding in. Therefore, the congruent version of (2) might well be (3):

(3) People protest (about x) by sending ?letters to y in large quantities.

For the purposes of creating data base that can be used as the basis for a generative Systemic Functional Grammar I suggest that this approach does not benefit us. Rather, what is needed is a grammar that can provide directly for metaphorical usage. And the Cardiff Grammar can indeed provide for this by analyzing the 'protests' in Example (1) as the 'Affected-Carrier' in a 'relational' Process of 'direction' (flooding in), with a covert direction, i.e. the protests are 'affected' by something external to the text, about which we need not speculate.

Halliday proposes examples of grammatical metaphor such as 'have a bath' and 'make a mistake', and, as was shown in Section 7.5.1, these are also allowed for in the CG. Halliday's description of grammatical metaphor states that 'a semantic configuration that would be represented congruently (non-metaphorically) by one type of clause is represented metaphorically by another' (1994:57). So, in the analysis in Example (4) what would congruently be realized as a PROCESS of *bathing* is, in Halliday's terms, realized metaphorically as a NOMINAL GROUP, and he analyses these occurrences as Process plus Range. The CG analysis, however, differs from this by treating the whole as part of the process, recognizing the nominal group as a Process Extensions, as in Example (4):

	S/Ag	M/Pro	MEx/PrEx
(4)	He	had	a bath

Halliday asserts that 'nominalizing is the single most powerful resource for creating grammatical metaphor' (1995:352). In treating nominalization as a type of 'grammatical metaphor', Halliday is implying that the analyses of such a phenomenon must provide both a congruent and an incongruent form. I see parallels between Halliday's notion of 'unpacking' and the approach to meaning of Wierzbicka, who states that 'meaning cannot be described without a set of semantic primitives' (1996:11) – which indeed it cannot. But in applying an 'unpacking' approach the 'meaning' is 'stripped away' to reveal 'primitives' by which a more complex term can be defined. Wierzbicka's approach to semantics is enlightening in its way, but should these semantic primitives be part of a model of language for language GENERATION? If a historically metaphorised use of language – such as *flooding in* in Example (1) – is 'stripped' enough, it is reducible to a set of semantic primitives, as in Example (3). In the COMMUNAL project the nearest equivalent to this level of representation is to be found in the **logical form** in the 'Belief System' (see Chapter 4 for a brief description of this). In modelling the level of meaning within language – which is our goal here – stripping back layers to this level does not necessarily produce a 'congruent' form.

Halliday and Matthiessen (1999)'s discussion of lexical and grammatical metaphor centres around 'phylogenetic', 'ontogenetic' and 'logogenetic' congruency, and they state that:

> 'on all these grounds we have to acknowledge that the metaphorical relationship is not a symmetrical one: there is a definite directionality to it such that one end of the continuum is metaphorical and the other is what we shall call **congruent**.' (1999:235).

They are suggesting that what comes first – historically, developmentally and textually – is the congruent meaning, and they state that it is necessary to recognize this congruent meaning and to signal when a metaphorical meaning is used.

In partial support of the position that I am taking, we can note that in Halliday's discussion of metaphor and how the metaphorical is 'in some respect "transferred"' (1994:342), he states that 'this is not to say that the congruent realization is better … or even that it functions as the norm'. And he also says that a congruent form and a metaphorical form may not be synonymous; 'the selection of metaphor is itself a meaningful choice, and the particular metaphor selected adds further semantic features'.

This points precisely to the problem we have when generating 'lexis as most delicate grammar'; how do we choose between two truly synonymous items? There will be some semantic reasoning to set them apart, and this is the very reason why metaphorical uses come into being – because there is a gap in the meanings of the congruent forms that are captured by the metaphor.

The topic of grammatical metaphor is extremely broad, and a great many of its concepts are open to discussion. A great deal of further work could have been conducted in this general area[77], and in deciding the best approach to dealing with metaphorical TRANSITIVITY. However, for the purposes of this research, where the

[77] See in particular Halliday and Matthiessen (1999) and Ravelli (1988).

focus is on a broad coverage of verb senses used in English, I have taken what might be described from some theoretical viewpoints as a rather weak stance, in which Process types whose meanings originate historically in a metaphorical use of language, such as *flooding in* in (1) and *upsetting* in *that upsets me* are treated as Processes in their own right. Examples have been analyzed in a 'combinatory' manner that makes for less use of the type of 'dual analysis' approach that is implied in Halliday's concept of grammatical metaphor.

The stance that I am taking, therefore, is that verb senses in which the metaphor is still 'alive' are 'unpacked' to their congruent meanings, and these will be classified under the congruent Process type. But verb senses in which the metaphor is considered 'dead' are analyzed as an extended meaning of the original verb sense that is now recognized as a verb sense in its own right. Thus, if a metaphorical extension of a verb sense is discovered that has been created for a specific occasion, its meaning will be 'unpacked' and its 'literal' meaning will be used, since it does not warrant a place in the network, and it will have been tagged as 'metaphorical' in the PTDB. However, if an occurrence of what may be termed 'dead', (or 'fading') metaphor (Fawcett, forthcoming a, Chapter 2), is found, it needs to be modelled as an established part of the language, and it is analyzed for its intended meaning.

For example, the multi-word verb *catch a glimpse of* is entered in the PTDB as a verb sense, and is recognized as a mental process of perception, just as *glimpse* is. This is an instance of grammatical metaphor where the verb 'glimpse' has been nominalized, and is an event noun in the Process of 'catching'. Therefore, the congruent meaning of 'catch' (which would be a 'relational' Process of 'possession') is no longer recoverable in this example.

7.6.3.2 An example of interrogating corpora in the case of problematic senses

A general problem in the analysis of the PTDB was that, despite the use of Fawcett's 'Guidelines' (forthcoming a) and consultation with colleagues, it was not always possible to easily determine what sense types should be recognized or what Process type category each sense type belongs to. Throughout the analysis of each verb sense according to its PRs therefore, the corpus was used as a source for checking problematic data.

An example of a high frequency verb form that proved to be problematic in assigning PRs was ‘open’. The resources that have already been discussed in this chapter were only partly helpful in discovering how this apparently simple verb form functions, and did not answer all the questions about its assignment to one or more Process types, and its Participant Role configurations. I therefore conducted a detailed corpus-based study of how ‘open’ behaves, and found that in a random selection of 1000 corpus examples[78] of ‘open’ functioning as a verb there was a distinct split between the occurrences of two role senses and one role senses. The following senses were found to occur:

Two Role Senses

1. The first major two role category was that of ‘Agent plus Created’, such as the event of ‘opening a shop’ as in *the Savoy Theatre was opened in 1881*. The types of things that can be opened in this sense are shops, studios, restaurants, new blocks, accounts and establishments.
2. Similar to this is the sense of the opening – but not creating – of shops on a daily basis, for example, *we opened the library at 9.00*. Here the PRs are ‘Agent plus Affected’.
3. The next frequently occurring two role category is that which might be considered the ‘prototypical’ sense of open – the opening of doors and windows, e.g. *he opened the window and looked out*. This seems to be some kind of ‘opening’ relative to an enclosure, and the movement of a moveable ‘closing device. Again, this sense involves the PR configuration of ‘Agent plus Affected’.
4. Then comes the two role sense of ‘beginning something’, e.g. *they are now ready to open negotiations*. This has the PRs ‘Agent plus Created’, as the Created is usually a type of discourse – debate, dialogue, formal peace talks, negotiations, public inquiry, key meeting, investigation.
5. The next two-role sense is one that at first appears to be related to the opening of doors, but which involves making available some ‘contained space’, e.g. *the Inspector opened a packet of cigarettes*. It has the PR configuration of ‘Agent plus Affected’, as typical ‘Affected's’ include packets, cans, cocktail cabinets, chests, drawers, safes, boxes, purses, wallets.

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[78] The corpus used for this random selection was the COBUILD Bank of English.

6. The next sense with two roles is that which is again related to making something available, but is not a contained space, e.g. *he opened the heavy Bible*. Again the PR configuration is ‘Agent plus Affected’, and the Affected may be one of a wide range of objects, e.g. newspapers, magazines, cervix, champagne, her nightgown, eyes, heart, mouth, old wounds, parachute, the border, its ranks, its markets
7. Finally, the last detectable two-role sense is the opening of a closing device – particularly the opening of a lid, e.g. *opening a can of beans*. This sense too has the concept of making something available, as with the sense described in (3) above, but here it is not container, but the lid itself. Further, sense (3) is likely to have a one-role equivalent, whereas this sense will typically require an Agent.

One Role Senses

1. The first high frequency one role sense of ‘open’ is the event which happens daily, and is of establishments such as shops, libraries, crèches, schools, as in *the library opens at 9am*.
2. The next one role category is (as with the two role above) the ‘prototypical’ seeming sense of ‘doors’ opening, but without an Agent.
3. Similarly to this sense, ‘lids’ can open on their own as well, however this is a very rare occurrence. An example such as *the bottle opened* is not likely, and so this one role, Affected only sense needs to be weighted as a low probability occurrence in the system network.
4. There is a ‘beginning’ one-role sense – of plays, exhibitions, ‘Titanic’, seasons, novels, afternoons, booking, investigation, and the PRs for this sense are Created only.
5. ‘Openable’ things can also open on their own, e.g. cervix, parachute, bridges.
6. Finally, an interesting and relatively new one-role sense of open is ‘the dollar opened at 1.44’. However, this is an idiomatic sense, and not central in a list of frequently occurring senses.

As a result of this exploration in the corpus, thirteen senses of *open* are included in the PTDB. It was only through a careful, manual examination of the corpus data that these senses could be determined. Although the *COBUILD English Dictionary* (1995) provides a detailed description of ‘open’ as it occurs in the corpus, this was found not to be sufficient when assigning to the verb form *open* its various Process Types and Participant Role configurations.

7.7 Conclusions

This chapter has been concerned with the production and analysis of a very large body of data about verb forms and their extensions. This body of data stands at around 5,400 entries, each of which includes an example and a gloss to identify and illustrate the verb sense, and a full CG analysis in terms of both Process type and Participant Role configuration.

As Chapter 8 will show, this database provides an invaluable source. With its 5,400 entries it is unique as a resource that may be consulted by those analyzing texts. But the main purposes for which it has been developed is for the creation of delicate system networks for TRANSITIVITY, and we shall see how this is achieved in Chapter 8.

Chapter 8: PROCESS TYPE: The Delicate System Networks for TRANSITIVITY

8.1 Introduction

This chapter is the culmination of work presented in the previous two chapters. I have previously stated that my goal in creating a very large data base of frequently occurring verbs, and then analysing these verb senses according to their Process type and Participant Role configuration (as was described in Chapter 7), is to extend the existing system networks and to create new ones so that these can implemented in GENESYS – the sentence generation component of the COMMUNAL project[79]. What is presented here, then, is the set of fully delicate system networks that I have developed, and these illustrate the applications in grammar-building of the data collection and analysis in the database described in Chapter 7.

To produce system networks that reach a more delicate level than those that already exist for the system of TRANSITIVITY, one must recognise that each lexical verb can be specified by a detailed semantic classification, i.e. its associated semantic features. And this, in the SF perspective, exemplifies Halliday's (1961) 'grammarian's dream' of treating lexis as 'most delicate grammar'. As we saw in Chapter 3, various scholars have addressed this proposal of Halliday's. Of these publications the broadest and deepest coverage of delicate system networks is Tucker's (1996a) presentation of his system networks for QUALITY. In his work Tucker usefully surveys the positions on system networks for lexis presented by other scholars within SFL over the years – e.g. Berry (1975), Fawcett (1980), Hasan (1987) and Cross (1992) – and he builds on these contributions to provide full and delicate system networks for the area of language which, in the CG, is known as QUALITY. In this publication Tucker demonstrates the way forward for SFL to succeed in creating delicate system networks for all areas of the language and for generating all lexical items. Reiterating Halliday's 1961 proposals, he states that

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[79] The COMMUNAL project was described in Chapter 4.

> 'the goal is … to treat lexis in the same way as structure, that is, as part of one unified system network representing the meaning potential of the language. Such a network, with its rightmost systems concerning the realization of the more delicate distinctions in meaning in individual lexical items, begins, I believe, to reflect Halliday's original notion of "most delicate grammar".' (Tucker, 1996:539).

In Chapter 3, Part 2 we saw Hasan's detailed system network for one small area of TRANSITIVITY. Hasan's work addressed the notion of creating delicate system networks to the point of realizing lexical items, and her work shows that the key to producing delicate networks is establishing groups of semantically similar verbs. The main problem in establishing such groups, however, is recognising what types of semantic relations occur between verb senses. In the traditional lexical semantic literature most of the recognised relations are for NOUNS. For example, Tucker (1996:550) discusses the ISAKINDOF and ISAPARTOF relations of hyponymy and meronymy: relations that typically hold between noun types. Here, we are concerned with relations between Process types, and for VERBS the most widely referred to semantic relation is the dubious relation of 'synonymy', as we have seen in Fellbaum's (1998) description of the 'synsets' in WordNet (Section 2.5.2 of Chapter 2).

Another semantic relation that holds between verb senses is 'troponymy'. This is a relation originally recognised by Fellbaum and Miller (1990), and their intention is that this relation should 'distinguish a "verb hyponym" from its superordinate' (1990:79). In a detailed corpus study of the verb forms 'crush' and 'squeeze' (Neale 1997), I found this to be the best lexical semantic description for semantically related verbs. This relation can be specified by the formula *To V1 is to V2 in some particular manner* (Fellbaum, 1998:79). However, arising from my study of 'crush' and 'squeeze', I suggested the usefulness of recognising a further relation which we might call 'bi-troponymy', where TO 'CRUSH' IS TO 'SQUEEZE' IN SOME PARTICULAR MANNER, AND TO 'SQUEEZE' IS TO 'CRUSH' IN SOME PARTICULAR MANNER. This bi-directional relation occurs frequently in the groupings of verb senses that I have recognised from the data contained in the Process Type Database (PTDB). This two-way relation differs from Fellbaum and Miller's mono-directional relation, because they recognise troponymy as a type of entailment, which only recognises mono-directional relations, i.e. *march* is a troponym of *walk*, and so *marching* entails *walking*, but *walking* does not entail *marching*. We will find the 'bi-troponymous' relation proposed here holding between various pairs of verbs in the system networks presented in this chapter.

In many others of the groupings to come out of the PTDB there seems to be some hyponymic type of relationship between the categories, i.e. there is often a 'superordinate' verb sense that defines the semantic group. The CG incorporates this relation into the system networks by using it as the entry condition to the system, and then adding an 'as such' feature to generate the item itself. We shall see examples in the full description of the system network below, e.g. in Section 8.3.2. We can also relate some of the hypernymic features to Wierzbicka's (1996) semantic 'primitives'[80]. In a system network, however, we are not treating a hyponymic or superordinate verb sense as a 'primitive', but instead as a semantic feature for defining a group of related verb senses. The hypernym serves as a sign that leads us to recognise a certain group-type.

Before I begin the full description of the main system networks that I have created through this study, I would like to comment briefly on how I propose to set out this description. The method for subcategorising Processes leads to systemic distinctions that are very similar across different system networks, especially as the meaning differentiations in the systems get narrower. In the description that follows there is therefore a lot of repetition of similar system networks. For example, in the 'action' networks, many of the systems have an [increase] vs. [decrease] distinction, e.g. for speed, temperature, size, etc. The verbal description of the various system networks given in this chapter therefore attempts to avoid the repetition of too much detail. To provide as clear and concise a description as possible I have included diagrams for each system network section, and these are the focus of the text description. And wherever possible I have provided references to more detailed descriptions by other scholars.

A second point to be made before the description begins is that the classification presented here does not claim to be entirely 'new'. The groupings are the way they are because this is how I – together with others who have contributed to the classifications through published work and/or personal communication – see this

[80] Wierzbicka's (1996) primitives were previously referred to in Chapter 7.

area of language on the basis of the criteria set out in Chapters 4 and 5[81]. There will inevitably be some similarities to other classifications.

What I wish to highlight as new about the system networks that I am presenting here is that they are sufficiently full to provide the relevant part of a computational implementation of a natural language generator, i.e. the Cardiff Grammar. And for each lexical verb that is generated from the system networks that follow there is an associated ‘realization rule’. The role that realization rules play in the Cardiff Grammar was introduced in Chapter 4, where I described the way that each realization rule specifies the actual lexicogrammatical output for each lexical item. What this then does is to specify the structural requirements of the abstract features that have been chosen in the system network, so that these lexical items can be expressed in the clause. The way in which they operate in these system networks will be explained in Section 8.3.1, where we reach a suitable set of specific cases for a regular verb, and then later in Section 8.4.4.1 we shall see how a realization rule operates slightly differently for an irregular verb.

A second major novel aspect of these system networks is that there are no others, so far as I am aware, that include such a high proportion of ‘multi-word verbs’ of all types. And a third novel feature of these networks is that they include estimates of the appropriate probabilities of each feature in a system being chosen.

8.2 The methodology for producing system networks

In Chapter 7 I described how the verbs in the PTDB were analysed in terms of two criteria: (1) their Process type and (2) their associated Participant Roles (PRs). As a result it was possible to reorganise the information in the PTDB from its arrangement as an alphabetical list – i.e. essentially a ‘dictionary’ model with each entry containing information about the item – into a ‘thesaurus’ model – i.e. with groupings of the six main Process type categories standing as semantically motivated categories. I checked through the PTDB for all occurrences of each major Process type, using the features in Column F in the spreadsheet, (as shown in Appendix A),

[81] I am particularly indebted to Robin Fawcett for working with me in the early stages of developing these classifications, and Fiona Ball and Gordon Tucker have also had a valuable input.

and then within each Process type I used the Participant Role configuration type (Column H) as a basis for the next stage of 'subclassification'.

This PR configuration provides no less than sixty broad categories. These 'Process type plus PR configuration' categories constitute the existing framework for TRANSITIVITY in the CG, as set out in Chapter 5, which is in turn taken from Chapter 2 of Fawcett (in preparation). My task in this chapter is to discriminate further semantic subcategories, and so to produce delicate system networks for generating lexical items, and this has involved teasing out the many further semantic differences that are required to model the relations between verb senses in each of the Process type groupings.

I used several sources that deal with similar relations to establish possible methods for classification. My starting point was Levin (1993)[82]. She provides a categorization in terms of 'alternations' for 3262 verb forms. I hoped that this might serve as a guide for further categorisation within the PR configuration groups. As described in Chapter 7, Section 7.6.1.2, I attempted to apply her 'verb classes' to each verb sense in the PTDB groupings of PR configuration type. However, it transpired that Levin's classes, which are largely governed by the syntactic alternations into which they enter, do not correspond anything like as closely to semantic classes as she claims – at least not as defined in terms of their PR configurations. In other words, Levin's supposedly semantic classes do not match closely with the Process type and PR type groupings of the CG, which has rendered her classifications much less useful than I had originally hoped. Nevertheless, I inevitably found that SOME of her broad categories match SOME of my Process type categories – for example, the well-documented area of 'change of state' type verbs (see Sections 8.3.2 and 8.4.4.3 for 'change of state' system networks).

The other sources that I used for potential classification of the verbs in the PTDB were Francis, Hunston and Manning's (1996) COBUILD publication, which classifies verbs according to the pattern of formal units they occur in; Faber and Mairel-Uson's (1999) *Constructing a Lexicon of English Verbs*, which classifies verbs in a 'semantic network', based on '*synsem* (syntactic-semantic) parameters' (1999:144); Matthiessen's (1995) *Lexicogrammatical Cartography*, which includes

[82] Levin's approach to verb classification is described in more detail in Chapter 2.

tables for the categorization of verbs – though, interestingly, he does not transfer them to system networks[83], and also Halliday and Matthiessen (1999), who provide a limited number of classification possibilities that they assign to their level of semantics, which – for them – occurs ‘above’ the lexicogrammar. And, finally, I consulted Roget’s Thesaurus, which, as a semantically based classification, is a further source of useful ideas for categorization. The ‘thesaurus’ model has been recognised in various Systemic Functional writings as a useful model, from Halliday (1961) to the present. As Tucker (1996:536) states, ‘one interesting observation on thesauri … is that they are organized on a basis of related meanings, a type of organization with which a systemic functional approach to lexis has much in common.’

The full TRANSITIVITY networks, which are presented in Appendix B, are written according to the conventions of ‘Poplog’. Note that they are complemented by the essential ‘realisation rules’, and that ‘probabilities’ are assigned to each feature[84]. As we saw in Chapter 7, the PTDB itself contains a great deal of valuable frequency information (though not for every entry), since it is based on the ‘second level’ use of corpora, and from this I was able to derive useful information on probabilities.

We can be relatively confident about the ‘guesstimate’ probabilities for the 134 most frequent verbs that COBUILD recognises, as these have an actual figure of occurrence assigned to them in the PTDB – but within the limitations of the facts that (1) the COBUILD figures are based on occurrences at the level of form, and (2) the frequency information does not include occurrences of multi-word verbs. Despite these limitations, it is clear that any category that includes one of these 134 verbs will have a high probability.

I should point out that, while the assignment of probabilities is central for a systemic functional model of language – and is something that the CG is striving to realize – the task of developing a probabilistic grammar based on corpus frequencies is very difficult, especially for the fairly full coverage that I am presenting here.

[83] I say ‘interestingly’, because he is working in the systemic tradition, and so we would expect him to present his classification in a system network.

[84] The concepts of ‘realization rules’ and ‘probabilities’ in system networks were introduced in Chapter 4.

Whilst the system networks presented both in this chapter and in Appendix B contain probabilities for each system, the figures included can only be based in part on real language examples. This is particularly clear in assigning probabilities for the non-terminal systems.

In principle, assuming a system network of simple dependency relations, as the system network for PROCESS TYPE largely is, it is possible to take the frequencies of an item that expounds each terminal feature in a pathway through the network (if these are known) and to derive from these the probabilities of the penultimate features, and so on back to the primary system in the network. However, at this stage of the research, when the status of the intermediate features cannot be considered to be finalized it has been decided not to undertake this massive task. What matters is the principle involved and where possible I have made, in consultation with Fawcett and other colleagues in COMMUNAL, 'guesstimates' in assigning probabilities, and incorporating COBUILD and other sources that include high frequency information.

We are now ready to examine the three major Process types for which I have produced delicate system networks. These are (1) the 'one-role', 'affected only', 'action' Processes, (2) the 'two-role', 'agent plus affected', 'action' Processes and (3) the 'three role', 'directional', 'relational' Processes. Together they account for about one third of the 5,400 verb senses in the current version of the PTDB, so the system networks to be described here are a very large sample of the full set required in a large, generative systemic functional grammar.

I will begin by describing the system network for 'one-role', 'affected only' 'action' Processes.

8.3 The system network for 'one-role', 'affected only', 'action' Processes

Our first task is to locate this system network within the overall system network for TRANSITIVITY in English. It is a continuation of the system network that we saw in Chapter 6 at Figure 6.1, and it is entered by choosing 'action', 'one-role', 'affected only' in that network. At this point, there are simultaneous choices in the systems for PROCESS TYPE and PARTICIPANT ROLE. What I am presenting here, then, is the subnetwork for the PROCESS TYPE choices.

This description will consider the whole of the system network for this Process type, from the entry condition to the most delicate feature, i.e. to the feature from which the lexical item itself is generated (which is always marked by the presence of a realization rule number). As you will see, many of the verbs of this type also occur as 'two-role', 'action' Processes (of the type 'agent plus affected'). However, for the reasons explained in Section 5.4.1 of Chapter 5, the two-role verb senses are modelled in a separate system network, and we shall be reminded of these reasons by the detailed description in Section 8.4 below. The verb forms that can occur as both one-role and two-role senses are precisely those which are involved in what are traditionally termed 'ergative' constructions, and which Fawcett, in his earlier work (Fawcett, 1980), termed 'affected-centred'. However, arising from work in the current project, Fawcett has changed the way in which the CG models TRANSITIVITY, treating these 'one-role' and 'two-role' verbs AS SEPARATE SENSES, which must therefore be modelled in different system networks. The initial section of the system network is presented in Figure 8.3.

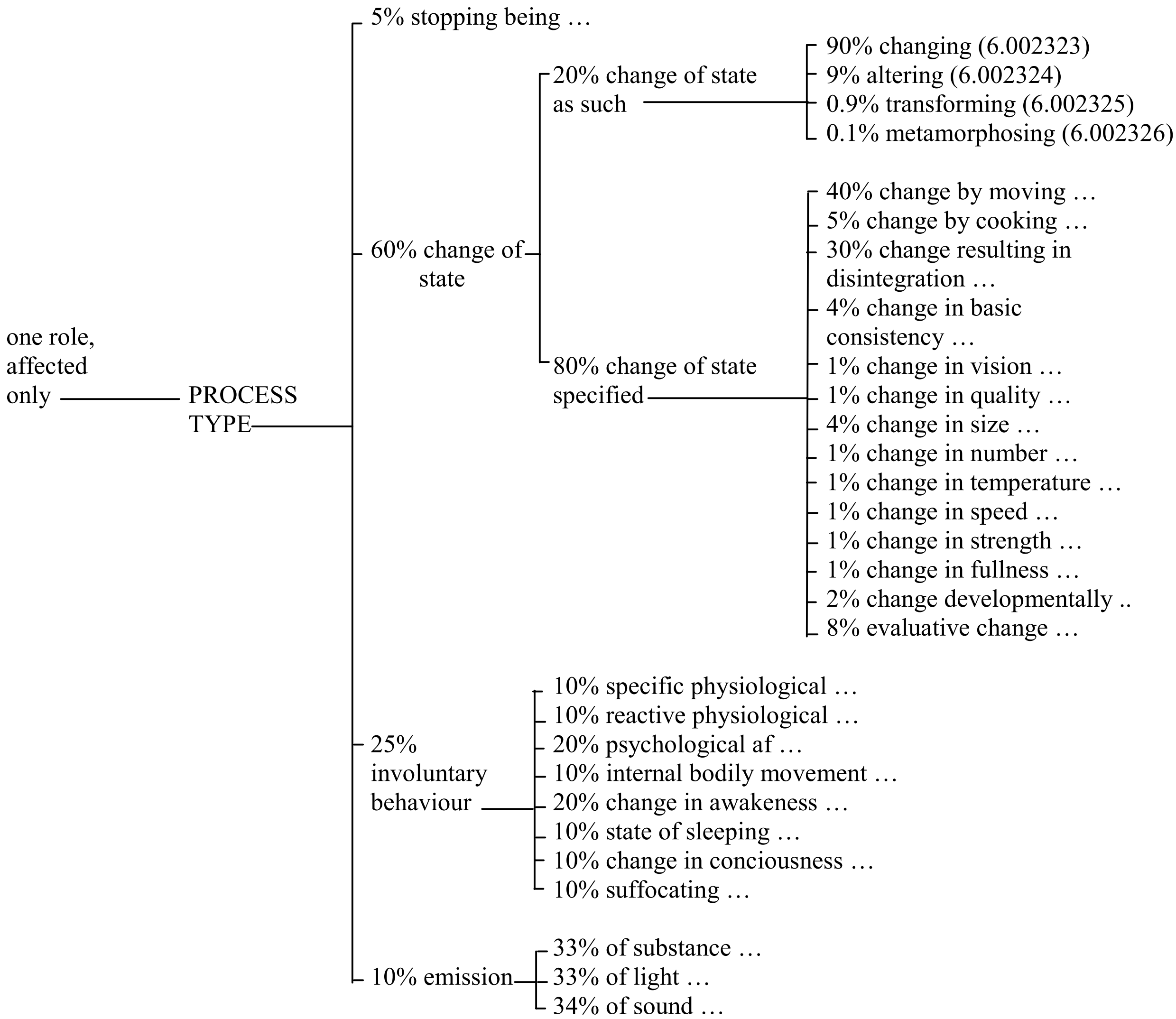

Figure 8.3 The early system for 'one-role', 'affected only' 'action' Processes

I will now take the four initial categories of this system network as typical examples of the problem of establishing highly generalized semantic features, and then I will describe the further classifications in the more delicate subsystems in the system network, and ultimately the way in which they generate lexical items.

The categories in this system are arrived at by working backwards in the data from delicacy in the categories of lexical verbs, that come at a later part of the system network, and that this description will deal with as it progresses.

This description will now be described in turn each subsystem in this system network for 'one-role', 'affected only' 'action' Processes, starting with the system for 'stopping being' Processes. One might at first think that 'stopping being' is simply another type of 'change of state', but the fact that the change is to a state of 'not being' warrants a separate category. And it is clear that the other two categories, 'involuntary behaviour' and 'emission' are not changes of state at all.

8.3.1 'Stopping being' Processes

The first system is the 'stopping being' Processes network, and the features are as shown in Figure 8.3.1.

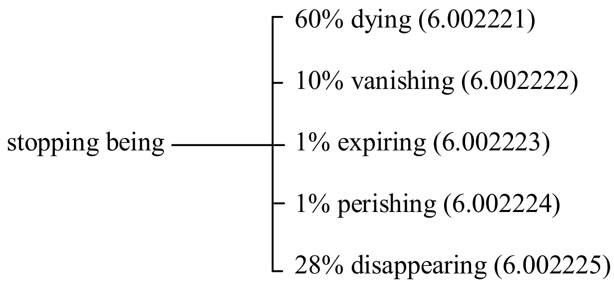

Figure 8.3.1 The system network for 'stopping being' Processes

In this system network we can see that each terminal feature has an associated realization rule. To exemplify how the realization rules function, we will look at the rule 6.002221, which is attached to the feature 'dying'. On reaching this feature in the network, we find that its realization rule is as presented in Figure 8.3.2:

6.002221 : dying : ‘M’ < “die”, ‘r’
if affected_unmarked the for ‘Af’ prefer
[‘BASIC TYPICALLY LIVING THING PREFERENCE BLOCK’,
‘TYPICALLY LIVING THING CULTURAL CLASSIFICATION BLOCK’]

‘BASIC TYPICALLY LIVING THING PREFERENCE BLOCK’:
[99.999% congruent thing / 0.001% thing identified by role in situation, stereotypical thing

95% name of person thing / 4.999% name of social group thing / 0.001% name of place thing

95% human / 5% non-human]

‘TYPICALLY LIVING THING CULTURAL CLASSIFICATION BLOCK’
[physical thing.
99.999% living thing / 0.001% non-living thing
99.999% creature / 0.001% plant
99% whole human / 0.001% part of human / 0.999% group of humans
99.99% artefact / 0.001% natural object
0.01% building / 59.95% vehicle / 0.01% container / 0.01% clothing / 0.01% for human consumption / 40% for performing tasks / 0.01% use of land]

Figure 8.3.2 The full realization rule for ‘dying’ (6.002221), taken from Fawcett, Tucker and Lin (1996).

To explain further, rule 6.002221 states that the selection of the Process of ‘dying’ causes the Main Verb, which is already in the structure being generated, to be expounded by ‘die’, and it states that this is a regular verb (‘r’)[85]. The rule also specifies that if, in the same pass through the network, the choice ‘affected unmarked’ has been made, then the following preferences should be applied to all choices. The rule also states what type of ‘thing’ can be expected to occur with the Process ‘die’, and this will govern the choices to be made on the re-entry to the system network for the generation of ‘thing’ to be realized in the clause.

I should perhaps add that the verb senses in the system network for ‘stopping being’ Processes might seem at first to contrast directly with a group that might have as their entry condition ‘starting being’, (for example ‘being born’, ‘arising’, ‘emerging’, ‘erupting’, ‘evolving’, ‘forming’, ‘materializing’, ‘resulting’, ‘appearing’, ‘blowing up’ and ‘breaking out’).

However, the ‘starting being’ group of Processes are in fact ‘created only’ Processes, because they all pass the test for a Created PR (see Appendix C), which is ‘What came into being was x’. And the ‘stopping being’ Processes pass the test for

[85] The realization rule for an irregular verb is slightly different, and an example of such a rule is given in Section 8.4.4.1.

an Affected PR, which is 'what happened to x was that …', and are thus generated in this system network.

8.3.2 'Change of state' Processes

We come now to the 'change of state' group of Processes. This is a very broad category and includes a wide range of types. As can be seen in Figure 8.3, this system has many subsystems, and I will present each in turn. This system is one of those that generates forms that occur as both 'one-role' and 'two-role' Processes. In the terms of Levin (1993), these verb forms are involved in either a 'middle alternation' or a 'causative/inchoative alternation'. Within the 'middle alternation' she recognises the 'middle construction', which is, in the CG, 'one-role' and 'affected only'. (In traditional grammar this clause type is simply one type of 'intransitive'). Within the 'causative/inchoative alternation' she recognises the 'inchoative construction', which is also a 'one-role' and 'affected only' in CG, and is traditionally the one-role form of an 'ergative' verb. I shall explain shortly, in the discussion of 'cooking' Processes in Section 8.3.2.1.2, the reason for treating these two as the same type.

As we saw in Section 2.4 of Chapter 2, the basis for Levin's categorisation is syntactic, and she states that her point of departure is 'to arrive at a classification on purely syntactic grounds, with the hope that this classification would receive semantic support' (Levin, 1985:2). The objective of my work is similar, in that it aims to build system networks that are syntactic in their basis, but my groupings are explicitly semantic. It is encouraging, that, in this case, the syntactic and the semantic groupings involve the same verbs, but we will find that this is by no means always the case.

The concept behind the 'change of state' category in the system network is one that is found in many discussions of verb senses, but the use of the term here is, historically, an adaptation of Fawcett's term 'change of physical state' in his 1980 network for 'affected-centred' Processes (1980).[86] He describes this network as 'a

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[86] Francis, Hunston and Manning (1996:5) has a category called the 'Change Group', which involves the verb *change* and some others that you will find in the present system network, but it has a less broad coverage than that found here. Levin (1993:240) uses the terms 'change of state' for one of her categories of verbs, and within this she and I have several similar sub-category types (for example, 'cooking' and 'breaking'). However I arrived at these category types not by simply borrowing from

very tentative and partial system network … for the cultural classification of 'affected-centred' processes in English' (1980:153). While his proposals may have been tentative, they have provided a useful basic system network for the present development of this area of TRANSITIVITY.

The first subcategory in the 'change of state' section of the network involves a distinction between 'change of state as such' verbs and 'change of state specified'. This type of 'as such' feature is used throughout the CG system networks for 'cultural classification'; that is, the system in the grammar that leads to the term that is accepted by the culture to classify a 'Thing', a 'Process' or a 'Quality'. [87] The 'as such' wording is used as part of the name for the features in the network that must be included in order to both (a) generate equivalent lexical items, and (b) serve as a superordinate category for generating further, more semantically delicate items. Thus, the feature 'change of state as such' enables the 'superordinate' Processes of change to be generated: 'changing', 'altering', 'transforming' and 'metamorphosing'. In contrast, the feature 'change of state specified' leads to further systems for choices between more semantically specific and so more delicate Processes of 'change' – as we shall see in the next system.

8.3.2.1 'Change of state specified' Processes

The system for 'change of state specified' is a very large system because of the number of verb senses that convey these types of meaning. The choices in the system are as presented in Figure 8.3, where the probabilities of occurrence are also shown.

8.3.2.1.1 'Change by moving' Processes

The first sub-system, 'change by moving', has the choices presented in Figure 8.3.3:

Levin (1993), but through the data and through the division of the CG Process type categories. So, for example, I have two cooking categories to represent the division of Process type categories: one in this 'one-role', 'affected only' Process type, and one in the 'two-role', 'agent plus affected' Process type.

[87] See Fawcett 1980:151f, 217f for his early system networks for the cultural classification of Processes.

change by moving
- 30% moving as such (6.002327)
- 30% moving relative to opening in enclosure …
- 1% moving relative to upright state …
- 1% moving relative to straight line …
- 38% inherently directional …

Figure 8.3.3 The system network for 'change by moving' Processes.

Once again we find the use of 'as such' in a feature. The feature 'moving as such' has a realization rule attached to it, which specifies that if this choice is made then the Main Verb in the clause will be expounded by the item 'move'.

The four other subsystems in this system are for a choice between various verbs of 'one-role', 'change by moving'. These verbs typically have another sense which involves two roles, but the 'one-role', 'affected only' sense of these verbs allows for the expression of movement without an Agent, and so involves the type of verb sense expressed in Example (1):

(1) The door opened.

Thus 'moving relative to opening an enclosure' Processes are as presented in Figure 8.3.4.

moving relative to opening in enclosure
- 45% opening (6.002411)
- 8% shutting (6.002412)
- 40% closing (6.002413)
- 2% reopening (6.002414)

Figure 8.3.4 The system network for 'moving relative to opening in enclosure' Processes

The 'moving relative to upright state' Processes are presented in Figure 8.3.5, and they allow for examples such as (2).

(2) The lorry overturned.

moving relative to upright state
- 1% capsizing (6.002415)
- 40% overturning (6.002416)
- 40% toppling (6.002417)
- 19% overbalancing (6.002419)

Figure 8.3.5 The system network for 'moving relative to upright state' Processes

The 'moving relative to straight line' Processes are presented in Figure 8.3.6, and they allow for examples such as (3).

(3) The branch bent.

moving relative to straight line
- 30% bending (6.002421)
- 50% turning (6.002422)
- 2% curving (6.002423)
- 2% swerving (6.002424)
- 2% looping (6.002425)
- 6% winding (6.002426)
- 8% twisting (6.002427)

Figure 3.8.6 The system network for 'moving relative to straight line' Processes

As the name of the next subsystem suggests, the 'inherently directional' Processes involve an inherent direction, and these Processes are presented at Figure 8.3.7. This allows for Example (4)

(4) The leaves dropped.

inherently directional
- 50% upward id
  - 50% coming up (6.002436)
  - 50% rising (6.002444)
- 50% downward id
  - 10% falling (06.002428)
  - 7% falling away (6.002429)
  - 7% falling back (6.002431)
  - 10% falling down (6.002432)
  - 10% falling off (6.002433)
  - 7% descending (6.002434)
  - 10% going down (6.002435)
  - 6% plummeting (6.002437)
  - 7% dropping (6.002438)
  - 6% sinking (6.002439)
  - 6% nosediving (6.002439)
  - 6% dipping (6.002442)
  - 6% plunging (6.002443)
  - 7% lowering (6.002445)

Figure 8.3.7 The system network for 'inherently directional' Processes

Many of the verb forms generated through this section of the 'one-role', 'affected only' system network will also appear in the 'directional' Processes system network, and we shall see part of this network in Section 8.5.

8.3.2.1.2 'Change by cooking' Processes

Rather similarly, some of the verb forms that occur in this subsystem also occur in the system for 'two-role', 'action' Processes, but this system is concerned with a choice between 'one-role' 'action' verb SENSES. Halliday and Matthiessen describe this group nicely as 'culinary happenings that occur without the cook's intervention' (1999:356).[88]

Let me use the discussion of this important area of meaning to illustrate the reasons why it is desirable to generate 'affected only' Processes through a separate system network from that for 'agent plus affected' Processes. The reason is that the two Process type groups ARE NOT COMPOSED OF THE SAME SET OF VERBS. For example, as we shall see in Section 8.4.4.3.3, the Process 'stir-frying' is a 'change of state', 'agent plus affected', 'action' Process, which MUST have an Agent because of the nature of the activity, and thus *stir-fry* is not a verb sense that is included in the

[88] While they claim that they are describing a 'semantic' level that is higher than the 'meaning potential' of the lexicogrammar, it is hard to see why this additional layer of networks is required.

system network for 'change by cooking', 'one-role', 'affected only' network. However, the grammar captures neatly the fact that a Process such as 'boiling' has the same form, irrespective of whether it is 'affected only' or 'agent plus affected', by sharing the same realization rule, and so the same realization rule number[89].

Within the whole range of 'affected only' verb senses that can be used to describe Processes involved in cooking (i.e. the change of state of food) I have identified subclassifications according to the method of cooking employed, as shown in Figure 8.3.8. These subclassifications are based on Fawcett, (1980:153).

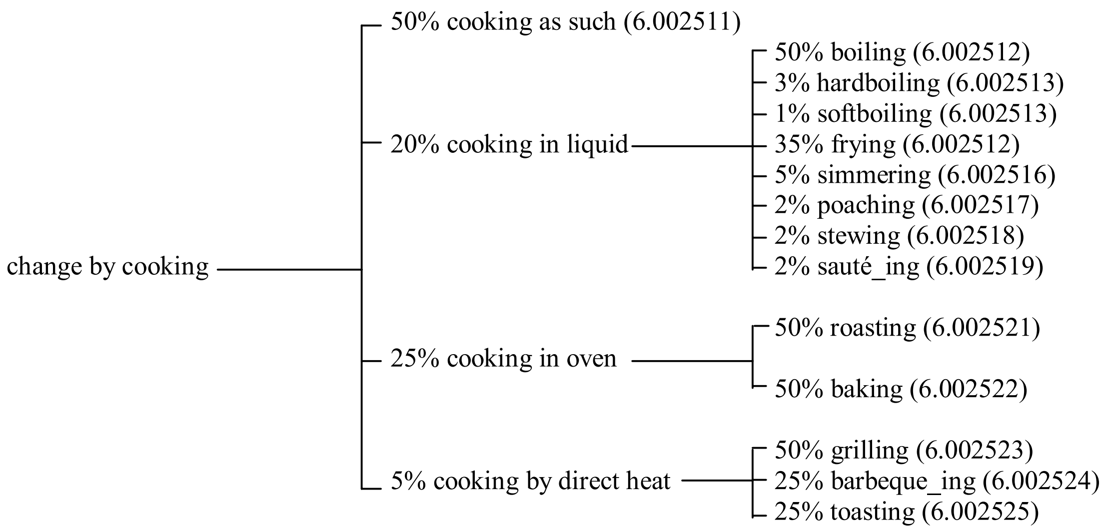

Figure 8.3.8 The system network for 'change by cooking' Processes.

8.3.2.1.3 'Change resulting in disintegration' Processes

Figure 8.3.8.1 shows the system network for 'change resulting in disintegration' Processes. The Processes generated through this system are of two types, defined by the degree of disintegration, and so the choice in the system is 'total disintegration' and 'non-total disintegration'. This choice was initially designed to reflect a split between two SEMANTIC types, and also between the FUNCTIONING of the two types, with the 'total disintegration' type verbs only functioning as 'one-role', 'affected only' Processes, these being 'falling apart', 'disintegrating', 'collapsing',

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[89] Indeed, it has two 'affected only' senses, as we shall see in 8.3.2.1.4.

'caving in' and 'decomposing'. But there is no sense of 'falling apart' that has two roles, as Example 1 shows.

(1) * We fell apart the tree house.

And we can recognise the 'non-total disintegration' type verbs (e.g. 'breaking', 'unravelling', 'splitting', 'fracturing' and 'crushing') as having two senses: one which is 'one-role', 'affected only', and one which can occur with an Agent, and is thus 'two-role', 'agent plus affected', and the two-role sense will be generated in another system, which is described in Section 8.4.4.1.

As Figure 8.3.8.1 shows, there is third choice in this system network. This generates the Process 'breaking down', which does not fall semantically into either of the other two semantic categories.

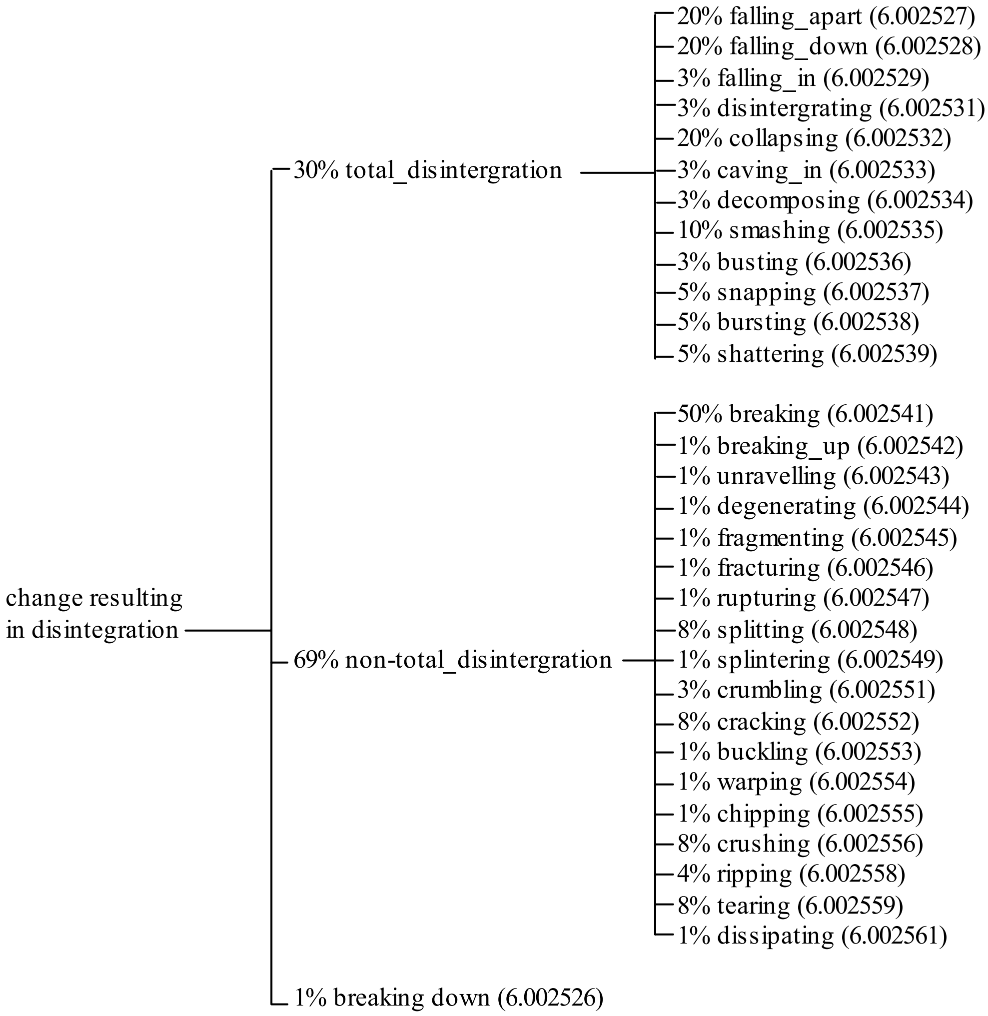

Figure 8.3.8.1 The system network for 'change resulting in disintegration' Processes.

In the system for 'total disintegration' and in the system of 'non-total disintegration' we find bi-troponymous relations. For example, 'to fall down is to cave in in some particular manner', and 'to cave in is to fall down in some particular manner', and also, perhaps, 'to rip is to tear in some particular manner' and 'to tear is to rip in some particular manner', particularly for the 'one role', 'affected only' sense.

8.3.2.1.4 'Change in basic consistency' Processes

The next group of 'change of state' verbs in the network all involve some type of 'change in basic consistency'. I have identified six types, and these are as presented in Figure 8.3.9.

change in basic consistency
- 20% change from liquid to solid …
- 10% change from solid to liquid …
- 10% change from liquid to gas …
- 10% change from solid to solid …
- 40% change from solid to gas …
- 10% non-specific change in basic consistency …

Figure 8.3.9 The system network for 'change in basic consistency'.

The choice of 'change from liquid to solid' leads to a system of choices between the Processes of 'solidifying', 'freezing', 'setting', 'congealing', 'clotting', 'curdling', 'crystallizing' and 'caramelising'[90].

The choice of 'change from solid to liquid' leads to a system of choices between the Processes of 'melting', 'liquefying' and 'dissolving'.

The choice of 'change from liquid to gas' leads to a system of the choices between the Processes of 'vaporizing', 'evaporating', 'drying', 'dehydrating', 'dehumidifying' and 'boiling'. The verb form 'boiling' occurs both in the system network for 'change in basic consistency' and 'change by cooking', to account for two different senses of the form. And each occurrence has the same realization rule.

The choice of 'change from solid to solid' leads to a system of the choices between the Processes of 'thawing', 'defrosting', 'tenderising', 'fossilizing' and 'ossifying'.

The choice of 'change from solid to gas' leads to a system of the choices between the Processes of 'burning' and 'incinerating'.

And the choice of 'non-specific change in basic consistency' leads to a system of the choices between the Processes of 'hardening', 'acidifying', 'oxidizing', 'emulsifying', 'corroding', 'firming up', 'softening', 'stiffening', 'depressurising', 'magnetizing' and 'ulcerating'.

Figure 8.3 showed that the 'change in basic consistency' system has a relatively low probability attached to it (4%), particularly in relation to the 'change by

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[90] From here on, I shall not reproduce the final system networks unless they involve a point on which I wish to comment, because they supply duplicate systems given in Appendix B.

moving' (40%) and 'change resulting in disintegration' (15%) systems. But it is not as low a frequency as some of the others we will encounter below, since it contains some fairly high frequency verb senses. For example, Francis, Hunston and Manning (1996) class the verb *burn* (which here is in the system network for 'change from solid to gas') as a '4 diamond' frequency. This means that the verb FORM occurs between 11,216 and 32,885 times in a corpus of 250 million words[91], which is their second most frequent class.

Unfortunately, it is not possible to assess from Francis, Hunston and Manning's (1996) documentation what proportion of these occurrences would be the 'one-role', 'affected only' sense.

8.3.2.1.5 'Change in vision' Processes

As the name of this system suggests, all the verb senses in this system pertain to visual perception. This is a new category of Processes that is introduced here for the first time, and the possibility of discovering such new categories is one of the benefits – and also the challenges – of creating a classification from a body of data such as the PTDB. In other words it leads to the recognition of new categories not found in previous classifications. The Processes in this system are 'blurring', 'clearing', 'dimming', 'fading', 'fading away', 'fading out' and 'fogging'.

It is important to recognize that these 'change in vision' Processes are not 'mental' Processes of perception, but that they refer to an Affected entity that 'changes' according to an observer's viewpoint. In other words, these 'change of state' verbs do not necessarily involve a PHYSICAL change.

8.3.2.1.6 'Change in quality' Processes

The verb senses generated through this system are to do with a change in the quality of some entity. The Processes in this system are as follows: 'warping', 'evening out', 'levelling out', 'mellowing', 'roughening', 'sharpening', 'slackening', 'steepening', 'straightening', 'sweetening', 'tautening', 'tightening' and 'reddening'.

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[91] See Section 6.6.3 of Chapter 6 for the whole of the COBUILD classification band frequency information, which I obtained from Dr Susan Hunston (personal communication).

The reason for designating these verb senses by the apparently overgeneralized name of ‘changing quality’ is that the roots of the forms are the same as some of the adjectival forms in the ‘cultural classification of Quality’ system network, as described in Tucker, 1995.

8.3.2.1.7 ‘Change in size’ Processes

The next system has two subsystems; one for ‘increasing size’ and the other for ‘decreasing size’. In the ‘increasing size’ system, the verbs ‘mushroom’, ‘balloon’ and ‘snowball’ are all specific to the ‘one-role’, ‘affected only’ group. But the other Processes in this system also have another sense, so that, like the Processes of ‘boiling’ that we considered in Section 8.3.2.1.2, they occur in the system for ‘two-role’, ‘agent plus affected’, ‘action’ Process system. These other ‘increasing size’ Processes are ‘enlarging’, ‘expanding’, ‘growing’, ‘increasing’, ‘inflating’, ‘broadening’, ‘fattening’, ‘heightening’, ‘lengthening’, ‘thickening’, ‘widening’, ‘spreading’ and ‘swelling’, and they are expounded in each case by the corresponding lexical verbs.

Interestingly, we find a different situation with the Processes in the ‘decreasing size’ system – where they all function both in a ‘one-role’, ‘affected only’ ‘action’ Process sense and in a ‘two-role’, ‘agent plus affected’, ‘action’ Process sense. These senses are ‘compressing’, ‘decreasing’, ‘contracting’, ‘shrinking’, ‘narrowing’, ‘thinning’, ‘lessening’, ‘shortening’, ‘reducing’ and ‘diminishing’.

8.3.2.1.8 ‘Change in number’ Processes

The ‘change in number’ system leads to a choice between two subsystems: ‘number specified’ and ‘number unspecified’.

The ‘number specified’ system leads to the verb senses ‘doubling’ and ‘quadrupling’, and leads to a system called ‘by three’, which leads to the verb senses ‘tripling’ and ‘trebling’. These two verb senses in the ‘by three’ system seem to be genuine synonyms, and as such require probabilities to reflect this. Thus the probabilities are as presented in Figure 8.3.10.

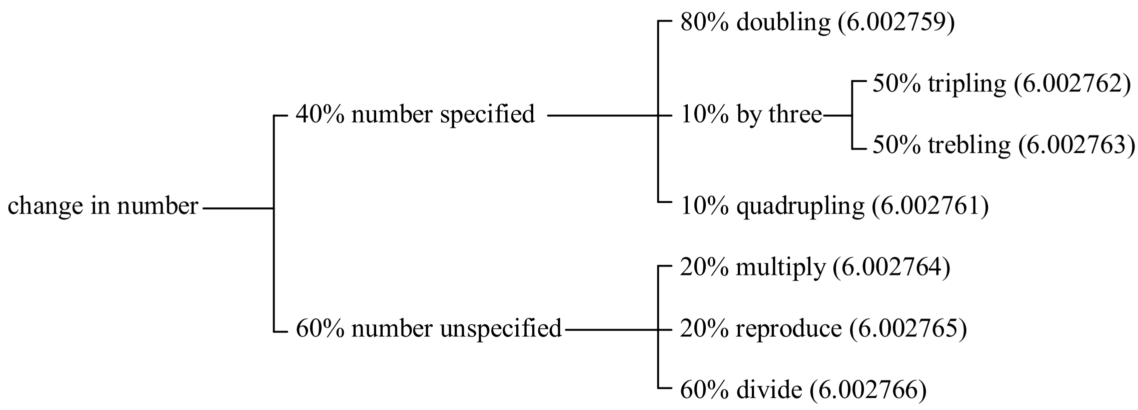

Figure 8.3.10 The system network for 'change in number' Processes.

This network illustrates another interesting point. As we get to this level of delicacy, i.e. the rightmost side of the system network, we can expect to meet synonyms and near synonymous items. In many cases, the choices made in the systems for DIALECT and/or REGISTER will determine the probabilities (e.g. depending on the degree of formality), by the placing of an SP rule on a prior feature in the system network[92]. However, there are examples such as 'tripling' and 'trebling' where the dialect does not appear to determine the usage, and for which we do not have appropriate frequency information. Francis, Hunston and Manning (1996) class both of these verb forms as occurring in the Band 1 category, i.e. between 232 and 1,394 times, and so here we simply assign a 50% / 50% probability.

Finally, Figure 8.3.10 shows that 'number unspecified' leads to verb senses which convey general 'change in number', and these are 'multiplying', 'reproducing' and 'dividing'.

8.3.2.1.9 'Change in temperature' Processes

Like the system for 'change in size', the system for 'change in temperature' involves a subsystem for distinguishing between 'increasing' and 'decreasing'. The 'increasing temperature' system leads to the Processes 'warming through', 'warming up', 'heating', 'heating up', 'overheating' and 'roasting', and so to a choice between the equivalent lexical verbs. And the 'decreasing temperature' system leads to the

[92] See Section 8.4.3.2.3 for an example of a SP rule.

Processes ‘cooling down’ and ‘chilling’, and so to a choice between the equivalent lexical verbs.

8.3.2.1.10 ‘Change in speed’ Processes

The ‘change in speed’ system also involves the ‘increasing’ vs. ‘decreasing’ distinction. The Processes in the ‘increasing speed’ system are ‘quickening’, ‘accelerating’ and ‘speeding up’, and the Processes in the ‘decreasing speed’ system are ‘slowing’, ‘slowing up’, ‘slowing down’ and ‘decelerating’.

This system provides us with a clear example of Levin’s omission of phrasal verbs leading to an omission of a meaning type. In the ‘increase speed’ system, by far the most frequently used Process is ‘speed up’. However, Levin does not include this phrasal verb in her study, and she includes the semantically related Processes ‘accelerate’ and ‘quicken’ in a rag-bag class of verbs, i.e. ‘other alternating verbs of change of state’ (1993:244). But these do not constitute a semantically related class, being simply a large group of verbs that can all involve the same alternations.

She does, however, consider the very different verb ‘speed’ as entering into the class ‘run verbs’, most of which would be analysed in the CG as being both ‘action’ Processes of the type ‘agent only’ and two-role directional Processes, as in ‘He ran (over) to the shop’.

8.3.2.1.11 ‘Change in strength’ Processes

The ‘change in strength’ system also involves ‘increasing’ and ‘decreasing’. However, only one verb sense of ‘decreasing strength’ is recognised, and so the choice in the system is directly between ‘weakening’ and ‘increasing strength’. The feature ‘increasing strength’ then leads to choice between ‘strengthening’ and ‘toughening’, as Figure 8.3.10.1 demonstrates.

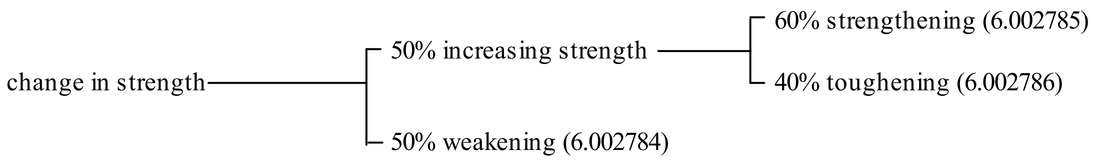

Figure 8.3.10.1 The system network for ‘change in strength’ Processes.

8.3.2.1.12 'Change in fullness' Processes

Again, this system also involves the choice between 'increasing' and 'decreasing'. 'Increasing fullness' leads to choice between 'filling', 'flooding' and 'filling up', which are realized as *fill, flood* and *fill up*. And 'decreasing fullness' leads to choice between 'draining' and 'emptying', which are realized as *drain* and *empty*.

For Levin, this group of verbs are also found in the general class, 'other alternating verbs of change of state', and so we can see the semantic distance between verbs in this class. These processes – *fill, flood, fill up, drain* and *empty* – are semantically unrelated to the processes of 'change in speed', despite the fact that they all take the same alternations.

8.3.2.1.13 'Change developmentally' Processes

The next sub-system of 'change of state' is 'change developmentally'. This system involves an 'as such' feature for a choice between the Processes 'developing', 'growing' and 'progressing'.

The other choices in the system are 'change developmentally: typically creature', and 'change developmentally: typically plant'. 'Change developmentally: typically creature' leads to the semantically related group of verb senses which consists of 'hatching', 'aging', 'maturing', 'growing up' and 'getting on'. 'Change developmentally: typically plant' leads to the Processes of 'sprouting', 'ripening', and 'germinating'.

8.3.2.1.14 'Evaluative change' Processes

The final system in the 'change of state' system network is that of 'evaluative change', as presented in Figure 8.3.11. This system offers a choice between two features, and the Processes involved are semantically related because they both convey the speaker's judgement on the value of the 'happening to' the Affected entity. The choice is between 'favourable evaluative change', which leads to the features 'improving', 'getting better' and 'ameliorating', and 'unfavourable evaluative change', which leads to the features 'worsening' and 'deteriorating'.

- evaluative change
  - 50% favourable
    - 49.5% improving (6.002823)
    - 50% getting better (6.002824)
    - 0.5% ameliorating (6.002825)
  - 50% unfavourable
    - 50% worsening (6.002826)
    - 50% deteriorating (6.002827)

Figure 8.3.11 The system network for 'evaluative change' Processes

8.3.3 'Involuntary behaviour' Processes

If we refer back to Figure 8.3, we can see that the next choice in the initial system for 'one-role', 'affected only', 'action' Processes is 'involuntary behaviour'. This name was chosen because all of these verb senses pass the test of 'What happened to x was …', so showing that behaviour involves an Affected rather than an Agent. This system has eight subsystems that are presented in Figure 8.3.12.

- (from Figure 8.3) involuntary behaviour
  - 15% specific physiological …
  - 15% reactive physiological …
  - 20% psychological …
  - 10% internal bodily movement …
  - 20% change in awake-ness …
  - 10% change in consciousness …
  - 10% suffocating af …

Figure 8.3.12 The system network for 'involuntary behaviour' Processes.

In the sections that follow I will describe each sub-system in turn.

8.3.3.1 'Specific physiological' Processes

The first sub-system of 'specific physiological' verbs includes all involuntary bodily Processes. As Figure 8.3.13 shows, this system is further subclassified into areas of specific bodily function.

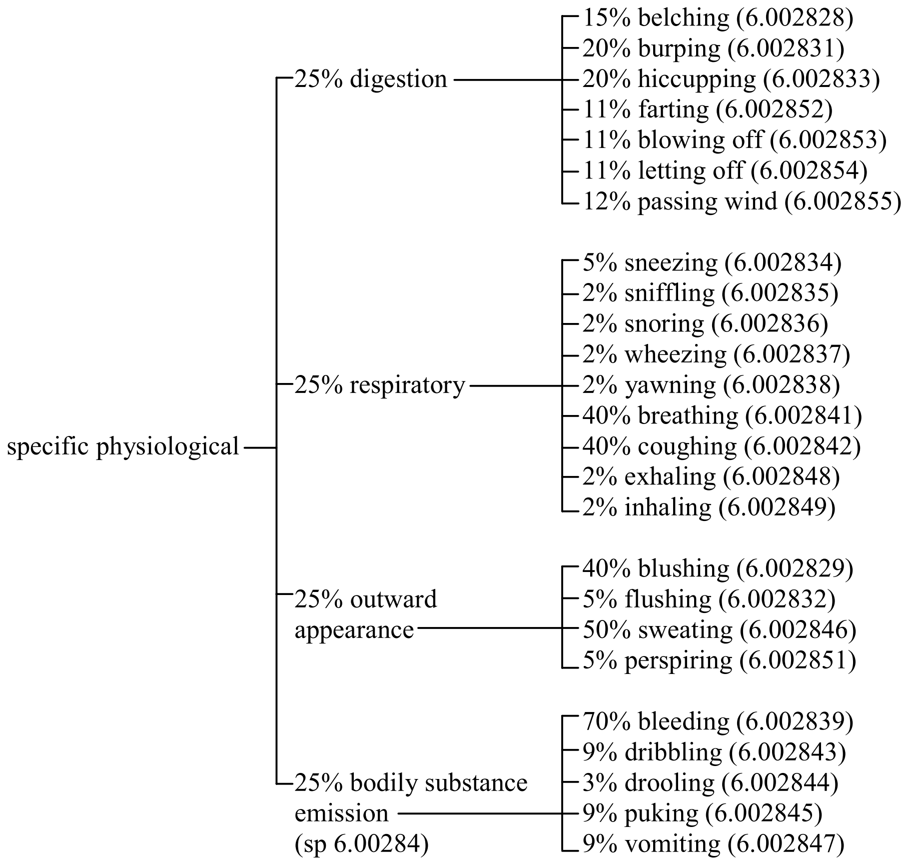

Figure 8.3.13 The system network for 'specific physiological' Processes

The first sub-system allows a choice between 'digestion' verb senses *belch, burp, hiccup, fart, blow off* and *let off*. The second sub-system allows a choice between 'respiratory' verb senses *sneeze, sniffle, snore, yawn, wheeze, breathe, cough, exhale* and *inhale*. The third sub-system leads to 'outward appearance' verb senses *blush, flush, sweat* and *perspire*. And the fourth sub-system leads to 'bodily substance emission' verb senses *dribble, drool, bleed, vomit* and *puke*. As stated in the introduction to this chapter, the probabilities are set for a 'casual', 'spoken' register, and thus the last two Processes in the bodily substance emission system network – 'puking' and 'vomiting' – are equally probable. However, the feature 'bodily substance emission' has a 'same pass' rule attached to it that states that if on the same pass, the register preference of 'formal', or 'written' has been chosen, then the probabilities would be changed to make 'puking' very unlikely to be chosen.

8.3.3.2 'Reactive physiological' Processes

The next system in the 'involuntary behaviour' system network leads to those Processes for describing behaviour that is 'reactive'. As Figure 8.3.14 shows, this system generates *cower, cringe, flinch, recoil, shrink* and *wince*.

reactive physiological
- 15% cowering (6.002855)
- 17% cringing (6.002856)
- 17% flinching (6.002857)
- 17% recoiling (6.002858)
- 17% shrinking (6.002747)
- 17% wincing (6.002861)

Figure 8.3.14 The system network for 'reactive physiological' Processes.

8.3.3.3 'Psychological' Processes

The next system is for three Processes that refer to the Affected entity as undergoing a 'psychological' happening. As Figure 8.3.15 shows, these are *break up, crack up* and *snap*.

psychological
- 45% breaking down (6.0028611)
- 45% cracking up (6.0028612)
- 10% snapping (6.0028613)

Figure 8.3.15 The system network for 'Psychological' Processes.

8.3.3.4 'Internal bodily movement' Processes

internal bodily movement
- 2.5% convulsing (6.002862)
- 2.5% quaking (6.002863)
- 7% quivering (6.002864)
- 40% shaking (6.002865)
- 7% shivering (6.002866)
- 7% shuddering (6.002867)
- 20% trembling (6.002868)
- 7% writhing (6.002869)
- 7% twitching (6.002871)

Figure 8.3. 16 The system network for 'internal bodily movement' Processes.

The next system generates Processes that are semantically related in that they all pertain to involuntary 'internal bodily movement'. This system leads to *quake, quiver, shake, shiver, shudder, tremble, writhe* and *twitch*, and (though it probably occurs more frequently in a two-role Process) *convulse*. Figure 8.3.16 shows this system network.

In this system network, the probabilities are set to prefer 'shaking', and then 'trembling' over all the other Processes. This is an example of where the probabilities directly reflect the frequency information provided by Francis et al (1996). Counter to our intuitions, which might suggest that 'shiver' occurs more frequently that 'tremble', the bands of frequency that Francis et al assign on the basis of the COBUILD corpus are as follows: 'convulsing': no band; 'quaking': no band; 'quivering': band 1; 'shaking': band 4; 'shivering': band 1; 'shuddering': band 1; 'trembling': band 2; 'writhing': band 1; 'twitching': band 1[93].

8.3.3.5 'Change in awakeness' Processes

The next system involves the Processes that occur involuntarily and involve either 'to waking state' or 'towards sleeping state'. As Figure 8.3.17 shows, the 'to waking state' Processes are 'awakening' and 'waking up', and the 'towards sleeping state' Processes lead to a system of 'complete sleeping state' ('falling asleep', 'going to sleep' and 'dropping off') and 'tiring'. The entry condition 'towards sleeping state' is an example of how it is possible to fit into the network a single Process type that has no near synonyms, and which may at first seem difficult to locate. The Process 'tiring' is the only type that I found in the data to specify this 'towards sleeping state' meaning.

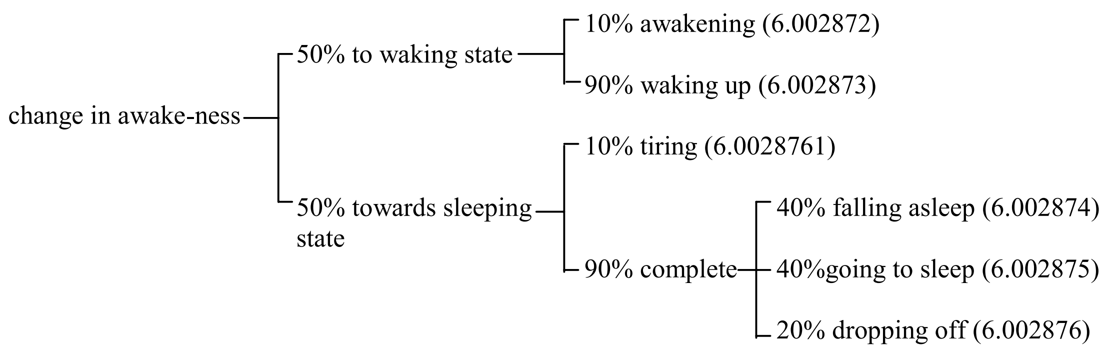

Figure 8.3.17 The system network for 'change in awake-ness' Processes.

[93] For the actual figures for each COBUILD band, see Section 7.3.3 of Chapter 7

One might at first expect that this progression towards ‘sleeping’ should logically be followed by the Processes that describe ‘state of sleeping’. However, the PR involved in such Processes is not in fact an Affected entity, because the Process does not ‘happen to’ the PR, but instead described the state in which the PR is. The Processes ‘sleeping’, ‘catnapping’, ‘dozing’, ‘drowsing’, ‘napping’, ‘slumbering’ and ‘snoozing’ will all be found, therefore, in the system network for ‘one role’, ‘carrier only’ Processes (which is not described in detail in this thesis).

8.3.3.6 ‘Change in consciousness’ Processes

Within the system for ‘change in consciousness’ there are two initial choices, as Figure 8.3.18 shows. The first is ‘to unconsciousness’, which leads to *faint*, *pass out, black out, collapse* and *drop*. The second choice does not lead to a further system, but to a Process, which is the only ‘one-role’, ‘affected only’ which contrasts with ‘to unconsciousness’, and this is *come round*.

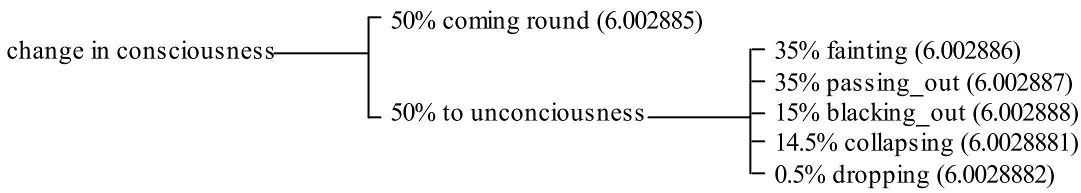

Figure 8.3.18 The system network for ‘change in consciousness’ Processes.

8.3.3.7 ‘Suffocating’ Processes

The ‘suffocate’ system allows for the choice ‘suffocate as such’, thus allowing for *suffocate*, and ‘suffocate specified’, which leads to a system with choices between *asphyxiate, choke* and *drown*, as Figure 8.3.19 shows.

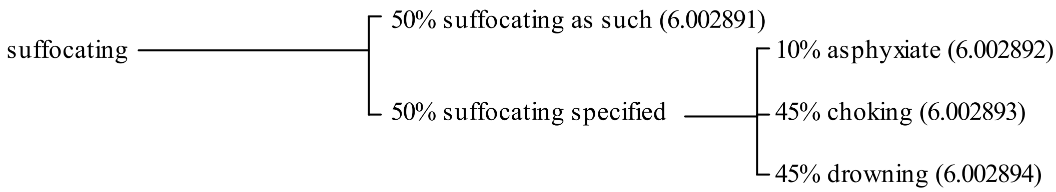

Figure 8.3.19 The system network for 'suffocate'Processes.

8.3.4 'Emission' Processes

The next major sub-system in the 'one-role', 'affected only', 'action' Processes is 'emission'. This leads to two subsystems, as presented in Figure 8.3.6.

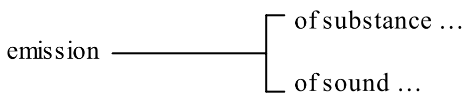

Figure 8.3.6 The system network for 'emission' verbs.

The feature 'emission of substance' leads to the verb senses 'bleeding', 'bubbling', 'dribbling', 'foaming', 'spilling out', 'squirting' and 'streaming'.

We have already seen the verb FORMS *bleed* and *dribble* in the 'specific physiological' system, but they need to be present in this system also, because here they refer to a different SENSE (i.e. non-bodily emission), e.g. 'the melted margarine dribbled over his fingers'. These two senses are, however, realized by the same realization rule, which allows for a single verb FORM to be generated in each of the two cases.

And finally, the 'emission of sound' system leads to a huge group of possible 'one-role', 'affected only', 'action' verbs, which could be further subclassified in terms of sound quality, sound intensity or other criteria. These are 'banging', 'beating', 'beeping', 'bellowing', 'blaring', 'booming', 'burbling', 'buzzing', 'chiming', 'chinking', 'clacking', 'clanging', 'clanking', 'clicking', 'clinking', 'clunking', 'groaning', 'growling', 'gurgling', 'hissing', 'hooting', 'howling', 'humming', 'jangling', 'jingling', 'moaning', 'murmuring', 'pealing', 'pinging', 'popping', 'shrieking', 'singing', 'sizzling', 'spluttering', 'squawking', 'squeaking', 'squealing', 'thudding', 'ticking', 'tolling', 'tooting', 'trumpeting', 'twanging', 'wailing', 'whining', 'whirring', 'whistling' and 'zinging'.

This system is based on sub-classifications proposed by Levin (1993:233). Her grouping includes 'emission of light' as well (for verb senses such as *beam, blaze, flame, flash, gleam, glimmer, glisten, shimmer, sparkle,* etc). However, this group does not have a place in this system network, because the associated PR with these Processes is not an Affected entity, but a Carrier. It is interesting to note this difference between types, and also to note an example where Levin's semantic classification does not fit with the Process type and PR configuration framework that this thesis applies to create semantically motivated system networks.

And so we come to the end of an exhaustive description for one whole area of TRANSITIVITY, in which the description has included the full systemic structure to the point of realization and probability of realization. This system network is the first attempt in the framework of the Cardiff Grammar, or of any other version of SFG, to build the notion of 'lexis as most delicate grammar' into a workable computational grammar for generating linguistic outputs.

I will not comment further at this point, but will simply proceed to consider a second very large area of TRANSITIVITY, which will provide a similar description of the system network for what has traditionally been regarded as the prototypical area of the meaning potential for TRANSITIVITY.

8.4 The system network for 'two-role', 'agent plus affected', 'action' Processes

The next system network for TRANSITIVITY to be described now is also located within the 'action' Process network – but it generates 'two-role' Processes that have both an Agent and an Affected. A very large number of Processes are generated through this network, and it is the most frequent Process type in database. Of the 5000 verb senses in the current version of the PTDB almost 1300 of them are 'action' Processes that have an Agent and an Affected[94]. Thus, approaching one quarter of the entire verb senses in the data are generated through this system network, so that the task of creating a system network that accommodates them all in

[94] I should point out that I cannot claim that 25% of Processes in English are of this type, because the development of system networks for any area of meaning leads naturally to the recognition of other systemically related Process types than those we initially found in the PTDB.

appropriate relationships to each other has been by far the biggest challenge of the present research.

In the PTDB there is a clear split between two major semantic types within this large number of 'two-role' Processes with the features 'agent' plus 'affected'. This split is between (1) 'social action' type verbs and (2) 'material action' type verbs, and it is represented by two of the features in the initial system for this network. However, two other choices allow for a smaller number of verb senses. These two other features are separate from 'social action' and 'material action' because they are non-specific to these two types of classification. The initial system is as presented in Figure 8.4.1.

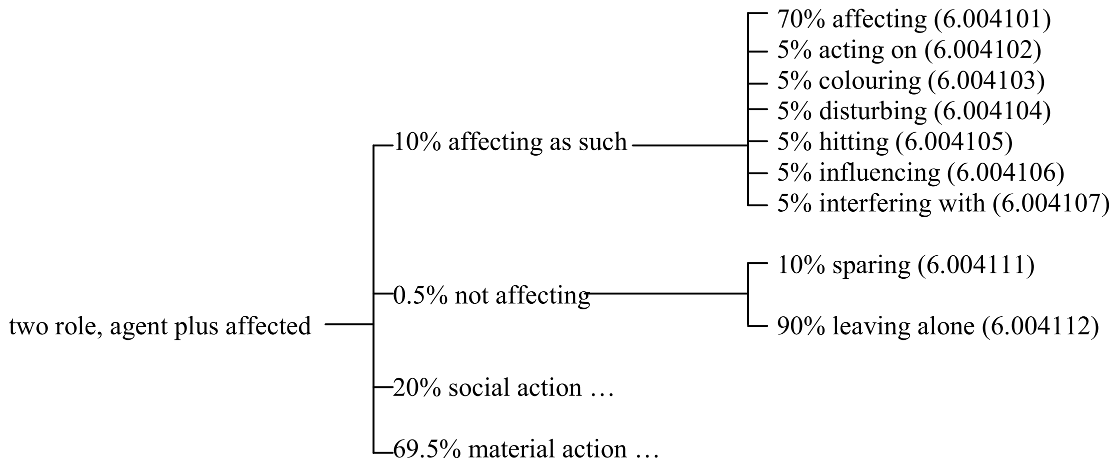

Figure 8.4.1 The initial system network for 'two-role', 'agent plus affected' Processes

It would, of course, have been possible to have a system in which the entry condition [two role, agent plus affected] led to a choice between [affecting as such] and [affecting specified], with [affecting as such] leading to a further choice between [affecting general] and [not affecting], and with [affecting specified] leading to a choice between [social action] and [material action]. However, as at other points in the TRANSITIVITY network, I have opted to cut out this possible initial system, so reducing the number of features generated on each pass through the network.

I will describe in turn the subnetwork to which each feature leads, and, as we shall see, the 'social action' and the 'material action' systems will include by far the largest number of verb senses.

8.4.1 'Affecting as such' Processes

The first subsystem is for generating the 'affecting as such' verb senses. Unlike the other 'as such' type choices that we have encountered, this choice enables a choice between several types of 'affecting as such': not only 'affecting', but also the other Processes shown in Figure 8.4.2, where 'colouring' is the sense *colouring X's viewpoint*. The senses of each of the verbs that are generated through this system are exemplified in (1) – (7), which are taken from the COBUILD English Dictionary (1995):

(1) Nicotine adversely **affects** the functions of the heart.

(2) The drug **acts on** the central nervous system.

(3) The attitude of the parents must **colour** the way children approach school.

(4) Take care not to **disturb** the costume.

(5) The plan to charge motorists is going **hit** me.

(6) Many medications **influence** cholesterol levels.

(7) Drug problems frequently **interfered with** his work.

affecting as such —
- 70% affecting (6.004101)
- 5% acting on (6.004102)
- 5% colouring (6.004103)
- 5% disturbing (6.004104)
- 5% hitting (6.004105)
- 5% influencing (6.004106)
- 5% interfering with (6.004107)

Figure 8.4.2 The system network for 'affecting as such' Processes.

I should point out that the sense of 'hit' generated in this system network is not the main sense of 'hit' (which is a two-role, agent plus affected Process, with intention, as in Section 8.4.4.1, Figure 8.4.5).

8.4.2 'Not affecting' Processes

The 'not affecting' system is in contrast with the 'affecting as such' system, as in examples (1) and (2):

(1) The policy has spared the farming community.

(2) Some people need to leave their traumatic past alone.

8.4.3 'Social action' Processes

As I have already stated, the system network for 'social action' Processes is, like that for 'material action' Processes, very large, with many subsystems, and I will describe these in turn. Because of the large number of 'social action' verb senses, one of the most difficult tasks in establishing this sub-network was to establish the initial, more general Process types for the first system. Figure 8.4.3 presents the bones of this system, and this shows that the first subsystem splits 'social action involving two parties' from 'general social action'. Interestingly it seems that there is a separate semantic group of verb senses that refer to actions specifically involving 'couples'.

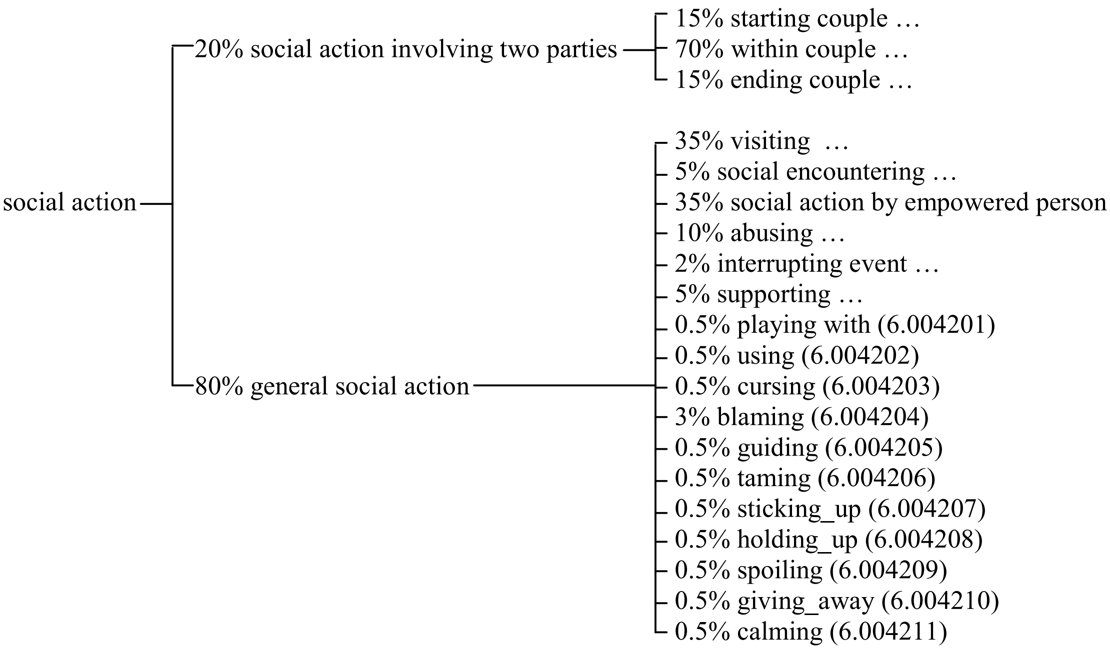

Figure 8.4.3 The system network for 'social action' Processes.

8.4.3.1 'Social action involving two parties' Processes

As Figure 8.4.3 shows, the system for 'social action involving two parties' is further subdivided into three types, each of which reflects a stage in the possible 'goings-on' in 'coupledom'. These stages – and therefore the systems – are 'starting couple', 'within couple' and 'ending couple'.

'Starting couple' Processes include 'asking out', 'proposing to' and 'proposing marriage to'. All of these Processes are realized by multi-word verbs, and these therefore require more complex realization rules. For example, the realization rule attached to the feature *proposing marriage to* will specify (1) that the Main Verb will be expounded by *propose*, (2) that a Main Verb Extension (MEx) will be generated which will be filled by a nominal group (ngp) with only a head, i.e. *marriage*, and (3) that a Complement will be generated and filled by a prepositional group in which the preposition is *to*, the completive of which has the PR of Affected conflated with it, as in Figure 8.4.4[95].

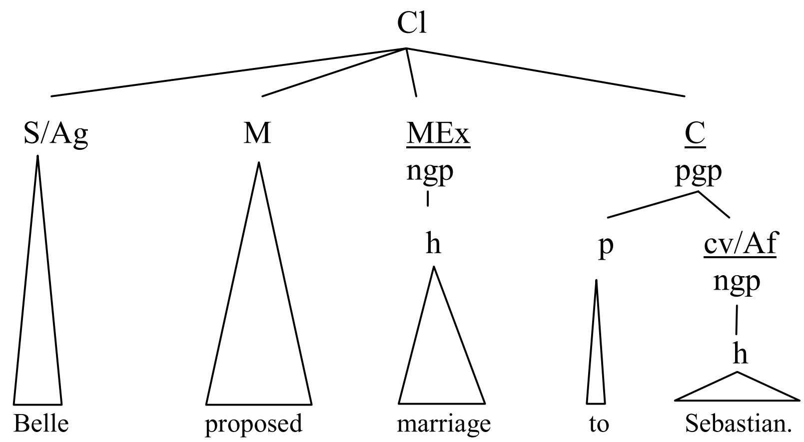

Figure 8.4.4 The CG analysis of 'Belle proposed marriage to Sebastian'.

The system for 'within couple' leads both to verb senses and to further subsystems. The Processes that are generated include 'embracing', 'getting off with' and 'going with'. And the further systems are for the verbs of 'hugging', 'cuddling', 'kissing' and 'having sex with'. The systems for 'hugging', 'cuddling' and 'kissing' all lead to further systems for (1) the verb senses 'as such' (i.e. the meaning of the feature with no further specification), (2) the other verb senses that refer to the action in a narrower way (e.g. *necking, snogging*). These include the multi-word verb senses that are realized as the reified Processes of *giving a hug/cuddle/kiss*. The realization rules for each of these multi-word verbs will be roughly similar to the realization rule for *proposing marriage to*, i.e. they generate (1) a Main Verb and (2) a Main Verb Extension (MEx), filled by a nominal group that expresses a reified (and so

[95] The composition of such realization rules are provided for in COMMUNAL in the complete version of the Cardiff Grammar. See Tucker (1996b) for a recent account of how they work.

nominalized) Process of hugging/cuddling/kissing. The system for ‘having sex with’ leads to this multi-word verb ‘as such’, and to more narrowly specified Processes: ‘making love to’, and ‘fucking’.

The ‘ending couple’ system leads to the various synonyms and euphemisms, most of which have arisen historically through the creation of metaphors for this Process. This system generates the Processes ‘divorcing’, ‘separating from’, ‘throwing over’, ‘dumping’, ‘finishing with’, ‘breaking up with’, ‘splitting up with’, ‘running out on’, and ‘leaving’.

8.4.3.2 ‘General social action’ Processes

Having dealt with the ‘couple’-specific verb sense, the next sub-system in the ‘social action’ system network is the system for ‘general social action’ verb senses, which leads to five subsystems. Figure 8.4.3.1 elaborates on the initial choices in the system network presented in Figure 8.4.3.

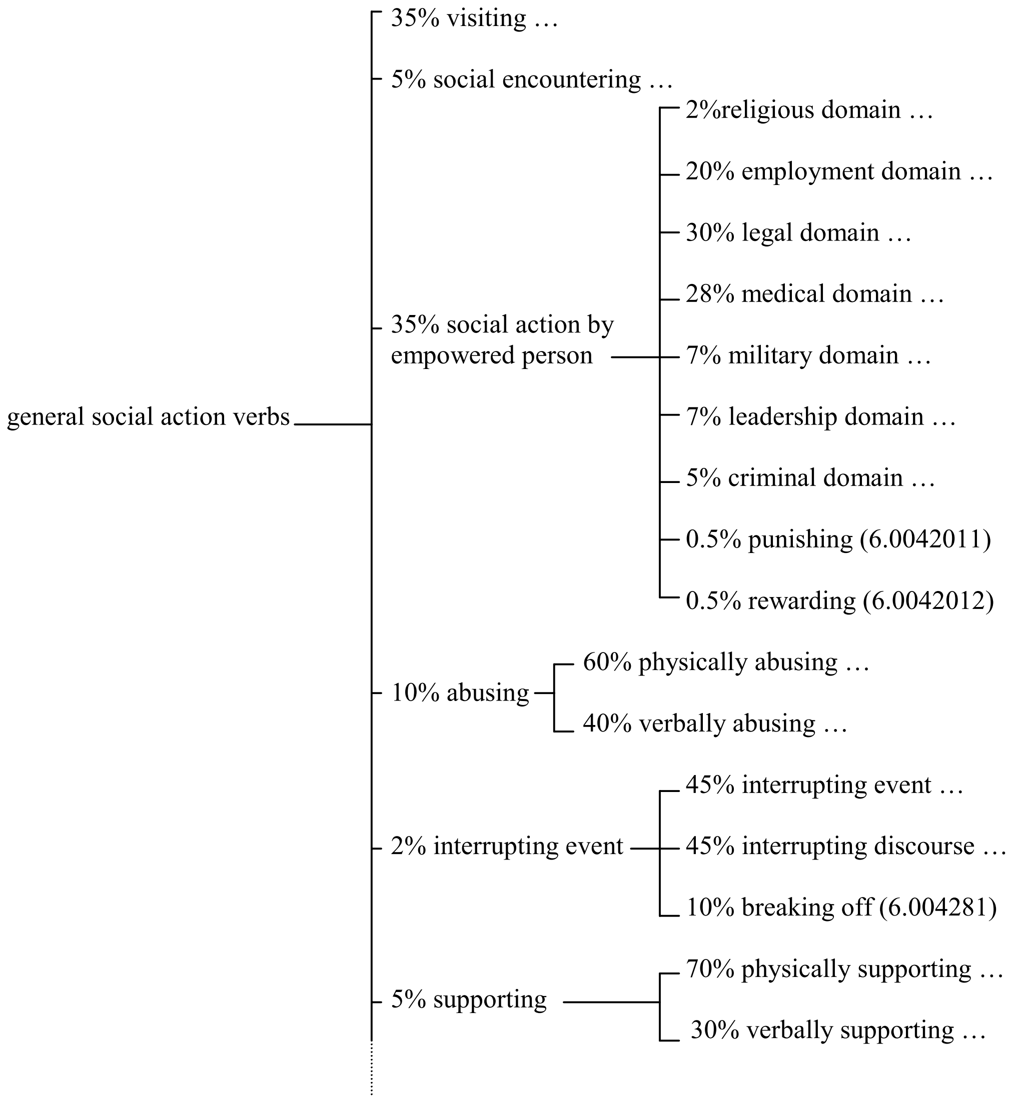

Figure 8.4.3.1 The system network for 'General Social Action' type verbs

8.4.3.2.1 'Visiting' Processes

The first system of 'visiting' leads to the Processes 'visiting', 'calling on', 'calling in on', 'seeing', 'meeting', 'meeting up with', 'getting together with' and 'looking up'. Notice that this is probably the untypical sense of 'seeing'. The verb form 'seeing' is far almost certainly found more frequently as a 'perception' Process. However here, as in all similar cases throughout the network, the same realization rule number is used in both cases, so capturing neatly the fact that a single set of forms associated with the verb *see* realize two (or in principle more) meanings.

8.4.3.2.2 'Social Encountering' Processes

I have recognised the 'social encountering' group of verb senses as a separate system network because of the unusually 'accidental' aspect that these verb senses convey, which places their typically first PR on the fringe of 'agentivity'. Also, they contrast with the 'not encountering' group, in which, of course, the 'agentivity' of the Agent is stronger. The 'encountering' system includes the Processes of 'encountering', 'meeting', 'bumping into', 'running across' and 'running into'. The 'not encountering' system includes the Processes 'avoiding', 'passing', 'passing over', 'ignoring', 'neglecting', 'standing up' and 'staying away from'. We can contrast this system with the 'material encountering' Processes we will meet in Section 8.4.4.1.

8.4.3.2.3 'Social Action By Empowered Person' Processes

The next major sub-system is 'social action by empowered person'. This system includes some of the verbs that Austin (1962) recognised as 'performative'. Examples of 'performatives' that function with the PRs Agent and Affected include *christen*, as in Example (1), and *sack* as in Example (2).

(1) She was christened in June.

(2) The Prime Minister sacked 18 government officials.

This is a semantic grouping of verb senses in which the uttering of the speech act (within certain constraints) actually BRINGS ABOUT real world happenings, and the title of Austin's 1962 publication, 'How to do things with words', reflects this. The notion of performative verbs led me to recognise that there are social domains within which an authorised person may 'bring about' a happening through language that is referred to by a verb sense. These areas function as subsystems in the network and are presented in Figure 8.4.3.1.

The 'religious domain' system is for the Processes 'blessing', 'christening', 'baptizing', 'confirming', 'marrying' and 'crowning'.

The 'employment domain' system leads to the Processes 'sacking', 'letting go', 'laying off' and 'making redundant'. The realization rule for 'sacking' states that if 'American English' has been chosen in the system for DIALECT, then the Main

Verb should be realized as *fire*, but if ‘British English’ has been chosen in the system for DIALECT, then the Main Verb should be realized as *sack*. This reflects the view that there is no difference in meaning between ‘sacking someone’ and ‘firing someone’. But if it was later found that there was some minor difference, two verb senses (‘sacking’ and ‘firing’) could be reorganised in the system, and a ‘same pass’ conditional rule could be attached to ‘employment domain’ stating ‘If on same pass American English then M < fire, else M < sack’.

The system for ‘legal domain’ includes the Processes ‘policing’, ‘arresting’, ‘pulling in’, ‘cautioning’, ‘charging’, ‘trying’, ‘fining’, ‘framing’ and ‘shutting up’, and the system also includes a further feature which is ‘imprisoning as such’. This leads to a sub-system that allows for the Processes ‘sending to prison’, ‘sending down’ and ‘jailing’.

The Process ‘sending to prison’ is a ‘reified process’, and is thus generated as a multi-word verb in this system. This contrasts with the most typical sense of the verb form ‘send’, which is as a ‘directional’ Process with three PRs (someone sends something somewhere). However, this ‘imprisoning’ verb sense is a multi word verb, and is thus a ‘two-role’, ‘Agent plus Affected’, as the analysis in Example (3) shows:

(3) The judge (Agent) sent (Main verb) Lord Archer (Affected) to prison (Main Verb Extension).

The next sub-system choice is ‘medical domain’ verbs. These Processes are ‘attending’, ‘treating’, ‘curing’ and ‘healing’.

The ‘military domain’ system leads to the Processes ‘attacking’, ‘defending’, ‘opening fire on’, ‘besieging’, ‘invading’, ‘occupying’, ‘seizing’, ‘taking’, ‘taking prisoner’, ‘conquering’ and ‘defeating’.

The system for ‘leadership domain’ leads to the Processes ‘commanding’, ‘leading’, ‘governing’, ‘taxing’, ‘punishing’ and ‘rewarding’. The Processes ‘civilizing’ and ‘modernizing’ can also be placed here.

The ‘criminal domain’ system leads to the Processes ‘stealing’, ‘robbing’, ‘holding up’, ‘doing over’ and ‘burgling’.

The final sub-system in the ‘social action by empowered person’ system network is that of ‘abusing’, and this leads to a choice between ‘physically abusing’ and 'verbally abusing'. The 'physically abusing' system leads to the Processes 'bothering', 'stalking', 'molesting', 'raping', 'assaulting' and 'abusing'.

The 'verbally abusing' system leads to the Processes 'teasing', 'taking the mickey out of', 'abusing', 'scolding', 'threatening', 'criticizing', 'tearing into', 'putting down', 'talking down to', 'running down', 'laying into', 'knocking', 'getting on at', 'getting at', 'getting back at', 'doing down', 'being on at', 'being hard on', 'being at' and 'standing up to'. It is interesting to note how many of these frequently used Processes are multi-word verbs, and thus, how important it is for the model to be able to account for these such Processes, as was described in Section 7.5 of Chapter 7.

The Processes that this system generates are mostly the metaphorised use of a verb that has another sense. Compare, for example (5) and (6).

(5) They accidentally knocked the doorframe when moving the wardrobe.
(6) I'm not knocking him for doing it.

As I suggested in Chapter 7, Section 7.6, these 'verbally abusing' verb senses (as in Example 6) are so commonplace in current usage that we can consider them examples of 'dead' metaphor.

Whilst most verbs of 'communication' are treated as 'mental' Processes, in the present approach I am treating these 'verbal abuse' Processes as 'two-role' Processes of the 'agent plus affected' type. The reason for this is that 'mental' Processes of communication in the CG are defined as someone causing someone to know something (see Fawcett, forthcoming a: Chapter 2, Section 3.5.3), and that they typically involve three roles – an Agent, an Affected-Cognizant and a Phenomenon[96]. The 'verbal abuse' verb senses in this system involve two roles, and the PRs pass the Agent and Affected tests reasonably acceptably, as (6a) and (6b) demonstrate.

(6a) What I did was knock him for doing it.
(6b) What happened to him was that I knocked him for doing it.

[96] This was described in Chapter 5, Section 5.6.4.

The next major subsystem of the 'general social action' system network is the system for generating 'interrupting event' type Processes. This system leads to three choices, and these are 'interrupting as such' (which generates *interrupt* as the Main verb); *break off* (which is then generated as the Main verb) and a further system of 'interrupting discourse'. Like the 'verbal abuse' Processes above, the Processes generated in this system involve verbal communication – but again they are not 'mental' Processes, since the PRs involved pass the tests for Agent and Affected. The Processes that the system for 'interrupting discourse' generates are 'breaking in on'; 'breaking into'; 'cutting into'; 'cutting off' and 'cutting short'.

Finally, the last subsystem in the 'general social action' system is the 'supporting' system. This leads to a choice between 'physically supporting' and 'verbally supporting'.

The Processes included in the 'verbally supporting' system are 'speaking up for', 'speaking for' and 'encouraging'.

The 'physically supporting' Processes are 'supporting', 'backing up', 'standing up', 'standing up for', 'sticking by', 'sticking to', 'sticking up for', 'getting behind', 'accommodating', 'looking after', 'bringing up', 'caring for', 'catering for', 'taking care of', 'tending' and 'nursing'.

Some of these verb senses stem from a concrete and very physical action, and thus the verb form *support* will also occur in the system network for 'material action', 'agent plus range'[97]. But the metaphorical extensions of these verb senses have become more current in everyday usage for describing social situations, and so we can recognise a separate semantic group and generate them through a separate system network. Nevertheless, we should not forget that because the FORMS are the same, the same realization rules will be used in both this system and where they occur in the 'material action' system for 'agent plus range'.

8.4.4 'Material action' Processes

The next system in the 'action' Process system network is for 'material action' Processes. This is a very large group of verb senses, which makes up part of the

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[97] In a typical example such as *The single pillar supported the whole roof*, 'the roof' does not pass the Affected test, and is therefore a Range.

semantic group that Halliday (1994) terms ‘material’ Processes. However, as we have seen, the Cardiff Grammar replaces Halliday’s term ‘material’ with ‘action’ as the superordinate term, because the same Participant Roles of Agent and Affected are found in both ‘social action’ and ‘material action’.

Figure 8.4.4 presents the initial choices in the ‘material action’ system network. The features in this initial system for ‘material action’ emerged from the grouping of Processes of this type into semantically coherent groups, and therefore these categories emerged from the bottom-up description that was described in Chapter 7.

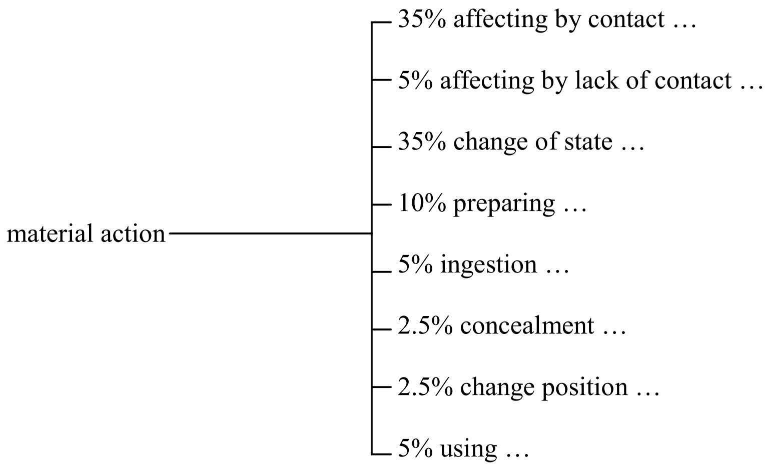

Figure 8.4.4 The initial choices in the system network for ‘material action’.

8.4.4.1 ‘Affecting by contact’ Processes

The entry condition to the first system is semantically transparent. It leads to numerous subsystems in this system, the entry conditions to which are presented in Figure 8.4.5.

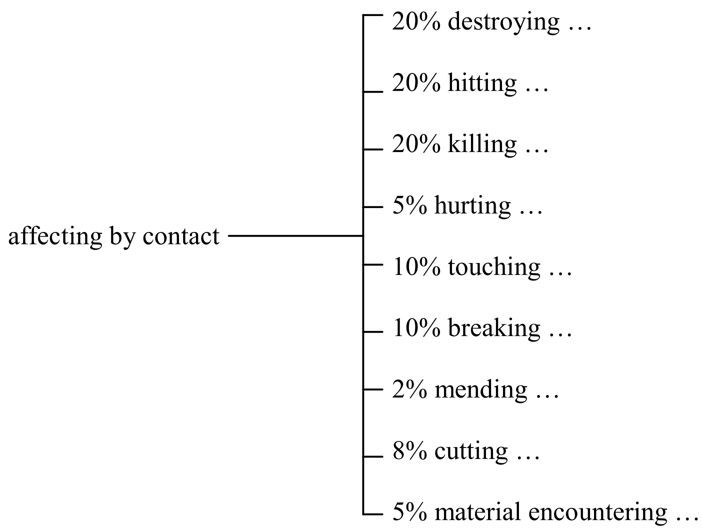

Figure 8.4.5 The system network for 'affecting by contact' Processes.

We can compare the subcategories in this system network with four of Levin's (1993) Verb Classes: 'break' verbs, 'cut' verbs, 'touch' verbs and 'hit' verbs. She recognises these separate groups according to the different alternations they take, which can be expressed in the matrix in Figure 8.4.5.1.

	touch	*hit*	*cut*	*break*
Conative	NO	YES	YES	NO
Body-part possessor ascension	YES	YES	YES	NO
Middle	NO	NO	YES	YES

Figure 8.4.5.1 Levin's classes and alternations for a set of verb types.

These differences in behaviour are indications of meaning differences. And what this example does is to illustrate that her basic hypothesis can then be captured in a system network, as in Figure 8.4.5, with the splits between groupings. However, my split does not incorporate, for example, the conative alternation, because I recognise the verb sense 'cut at' to have a different meaning from that of 'cut'. It is therefore generated in a further section of the overall TRANSITIVITY system network, in the sub-system of ‘affecting by contact’ that has ‘cutting’ as its entry condition.

The subsystem for generating ‘destroying’ verb senses contrasts with the ‘one-role’, ‘affected only’ subsystem of ‘total disintegration/non-total disintegration’, which we saw in Section 8.3.2.1.3. There we noted that Processes of the type ‘total disintegration’ can ONLY occur with one PR, whereas the Processes in the ‘non-total disintegration’ system can occur with both a single PR sense (‘affected only’) and a two PR sense (‘agent plus affected’). It is here, among the ‘destroying’ Processes that we find the two-role equivalents of ‘non-total disintegration’.

In the group of ‘destroying’ verbs, many of the verb forms function with two separate PR configurations, whereas some verb forms can ONLY function with ‘two-roles’ of ‘Agent plus Affected’. To illustrate the point, consider the verb *destroy*. It can only function as in (1) and not as in (2). This Process necessarily requires an Agent to bring about the happening that is ‘destroying’.

(1) The wrong instructor can destroy your confidence.
(2) *The building destroyed.

As I pointed out in Section 5.4.1 of Chapter 5, we have decided, in the CG, not to try to capture the generalisation that Levin terms the ‘causative/inchoative’ alternation (1993:27) as a single system, and thus we no longer make the agent-centred / affected-centred distinction that Fawcett made in his 1980 network. However, the fact that some of these verbs (such as *destroy*) occur only with two PRs and some with one or two (such as *shatter*) is still reflected in the grammar through the fact that the two features that generate the two Process types share the same realization rule number.

The Processes in this system are ‘destroying’, ‘kicking down’, ‘kicking in’, ‘knocking down’, ‘knocking out’, ‘pulling down’, ‘wrecking’, ‘ruining’, ‘spoiling’, ‘tearing down’, ‘wasting’, ‘tearing apart’, ‘blowing up’, ‘breaking down’, ‘breaking up’, ‘burning’, ‘crushing’, ‘exploding’, ‘bursting’, ‘sinking’, ‘washing away’ and ‘washing down’.

The next system for generating ‘affecting by contact’ verbs is the ‘hitting’ system. This leads to a number of verb senses, which can be described as ‘troponyms’ (Fellbaum and Miller, 1990), of ‘hitting’, in line with the discussion in the introduction to this chapter. For example, 'beating' is 'hitting' IN A PARTICULAR MANNER. This system could perhaps be taken to a further level of delicacy in which each verb sense is generated in terms of the manner in which the 'hitting' takes place. Examples of the Processes generated in this system are 'hitting', 'hitting at', 'hitting out at', 'beating', 'biting', 'cutting at', 'crashing against', 'hammering at', 'knocking about', 'pushing', 'pinching', 'running through', 'shooting away', 'striking' and 'whipping'.

As this system network includes the irregular verb 'beat', this seems to be an appropriate point to provide an example realization rule for an irregular verb. The realization rule is as follows:

```
6.004311 : beating : 'irr' (beating)
        if affected_unmarked then for 'Af' prefer
        ['BASIC_TYPICALLY_LIVING_THING_PREF_BLOCK',
        'TYPICALLY_LIVING_THING_CC_PREF_BLOCK'].
```

In Section 8.3.1, the realization rule '6.002221' was presented, and here we saw that BASIC TYPICALLY LIVING THING PREF BLOCK and TYPICALLY LIVING THING CC PREF BLOCK are a means for specifying what 'thing' or 'things' will typically occur with the Process. This difference with this realization rule for 'beating' is that it specifies 'irr', and so is marked as 'irregular', and it leads us to the general 'irregular verb subrule table'. This, in turn, leads us to the entry for the irregular verb 'beat', as displayed in Figure 8.4.5.2 (which is taken from a table of many hundreds of such entries, these being derived from Quirk et al, 1985).

```
Irregular verb subrule table:
'irr_base_subrule':        'M' < lookup(irr_verb, F, base).
'irr_past_subrule':        'M' < lookup(irr_verb, F, past).
'irr_pp_subrule':          'M' < lookup(irr_verb, F, pp).

irr_verb  base             past            pp
[beating, 'beat',          'beat',         'beaten']
```

The next subsystem is for 'killing' type verbs. For Francis, Hunston and Manning (1996:19), the 'kill' group of verbs include 'verbs concerned with harming, breaking, attacking, or destroying something or someone'. So for Francis, Hunston and Manning (1996), the 'kill' group is a large and semantically diverse group. This reinforces the sense that among the very large number of Processes which are generated in the system of 'affecting by contact', the 'kill' type Processes constitutes a subsystem. I am introducing a smaller group than Francis, Hunston and Manning suggest for those Processes that specifically refer to 'killing'. And this subsystem is for verbs that denote particular ways of 'ending life' by 'affecting by contact'. Some might perhaps argue that, if the 'physical abuse' type verbs are generated through the system of social action (as we saw in Section 8.4.3.2), then the 'killing' type verbs should be as well. But Francis, Hunston and Manning's (1996) 'kill' group of verbs are clearly, like mine, 'material action' (e.g. *break, hit, cut*, etc.). In contrast they do not include the senses that I class as 'physical abuse' (e.g. *bother, stalk, molest, rape, assault, abuse* and *set on*) as part of this group[98].

The verb senses that realize the Process of 'killing', and which are generated through this subsystem, are as follows: assassinate, choke, drown, hang, kill, kill off, knock off, murder, shoot, suffocate, do in, do away with, bump off, burn to death, take out and put down. Within this group there is a further division between a first group of verb senses that are troponyms of 'killing', and a second group of verb senses that are euphemisms for an event that it is culturally 'difficult' to refer to.

The next subsystem of 'two-role' 'agent plus affected' verb senses is that of 'hurting'. One might be tempted to think that these Processes involve some degree of 'perception', on the grounds that an action can only be defined as 'hurting' if the Affected entity perceives it as such. However, this 'perception' – if that is what it is – is caused by a 'material action' by an Agent, and the PRs involved pass the Agent and the Affected tests. For example, 'What X did was to hurt/injure/wound the child' and 'What happened to the child was that X hurt/injured/wounded it.'

The Processes that are generated through this system are 'burning', 'cutting', 'harming', 'hurting', 'injuring', 'putting out', 'dislocating', 'skinning', 'blinding', 'rubbing', 'scratching', 'scraping', 'stinging', 'wounding', 'twisting' and 'winding'.

Next we come to the subsystem for 'touching' verb senses. So far, the subsystems that we have seen in the system network for 'affecting by contact' have all involved the semantics of violence, for example, 'destroying', 'hitting', 'killing'. The 'touching' subsystem leads to verb senses that are typically non-violent but still involve some contact. Examples of 'touching' Processes are: 'being at' (in the sense

[98] In fact, it is not clear how they would classify this group of semantically similar verb senses.

of *Who's been at my things?*), 'tapping', 'brushing', 'fingering', 'pressing', 'rubbing' and, of course, 'touching as such'.

The next subsystem is for generating the semantic group of 'breaking' type verbs. The verb forms generated in this subsystem will have the same realization rules as the verb forms generated through the 'one-role', 'affected only' Processes that we saw in Section 8.3.2.1.3. However, they are generated through this system because they are different verb senses. The verb senses are: 'breaking as such' with the 'specific' types being: 'bursting', 'chipping', 'cracking', 'crashing', 'crushing', 'fracturing', 'ripping', 'shattering', 'smashing', 'snapping', 'splintering', 'splitting', 'splitting open', 'tearing', 'tearing up', 'collapsing' and 'damaging'.

The next system is for generating verb senses of the 'mending' type. The Processes in this subsystem are 'mending', 'fixing', 'repairing', 'touching up', 'taking in' and 'screwing down'. The entry condition to this system has a 'same pass' rule attached to it which states that if the choice [casual] has been made in the MOOD network, then in this system network the choice should probably be 'fix'; if [consultative] has been chosen in the MOOD network then in this system network the choice should probably be 'mend'; and if [formal] has been chosen in the MOOD network then in this system network the choice should probably be 'repair'.

The next system is for generating a group of verbs that are troponyms of 'cut'. These Processes are 'cutting', 'cutting into', 'cutting off', 'cutting up', 'sawing', 'snipping', 'trimming', 'carving', 'dicing', 'filing', 'shredding', 'tearing' and 'shaving'.

The final subsystem in this system of 'two-role', 'affecting by contact' generates a group of verbs that are comparable to the 'social encountering' system we saw in Section 8.4.3.2.2. This is the 'material encountering' system, which allows for the generation firstly of a different sense of 'bumping into' and 'running into' which is not of a social nature, but as in Example (3), and which also allows for a different sense of 'hitting', which is the 'non-intentional' sense, as in Example (4). In this system we also find the 'material encounter' Process, 'collide with'.

(3) He bumped into the table.

(4) The car hit the stationary vehicle.

8.4.4.2 'Affecting by lack of contact' Processes

The next system in the network can only occur in contrast with the 'affecting by contact' verbs, and, as far as I am aware, this system only generates one verb sense, which is *missing*. This verb sense is also interesting because the PRs involved do not seem to pass Fawcett's (forthcoming a) PR tests for Agent and Affected, as shown in Example (1) and (2):

(1) *What Alfred did was to miss the ball.

(2) *What happened to the ball was that Alfred missed it.

However, even though the tests sound strange, it is difficult to suggest what this Process might be in not 'action' and 'agent plus affected'. There is another sense of 'missing' that is a 'mental' Process with the roles 'emoter' and a 'phenomenon'. Examples (1) and (2) are much more acceptable if they are interpreted in a context where they would be analysed as realizing the 'emotion' sense of the verb.

8.4.4.3 'Change of state' Processes

The next subsystem is the very large one for 'change of state' Processes. We came across a similar system to this in Section 8.3.2.1, where the system generated 'one-role', 'affected only' verb senses of the type 'change of state specified' (e.g. 'grilling', 'freezing', etc).

I will present each system in turn, but there will not be much to say about each, as the reasons for the semantic groupings are intelligible from the entry condition to each and for the comments on the equivalent systems presented in later Sections. The subsystems in the 'change of state' system network are presented in Figure 8.4.6.

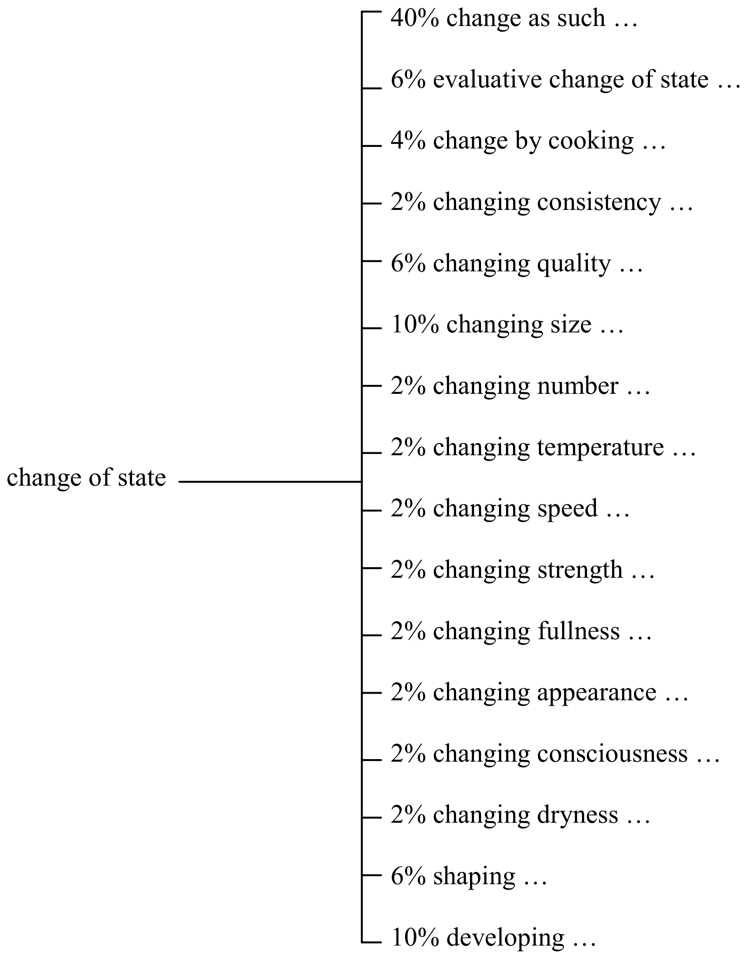

Figure 8.4.6 The system network for 'change of state' Processes

8.4.4.3.1 'Change as such' Processes

The first subsystem that we encounter is for generating the verb senses that are semantically grouped with the verb sense 'changing'. The other verb senses in this group are 'altering', 'transforming' and 'turning around'.

8.4.4.3.2 'Evaluative change of state' Processes

Next we come to the system for 'evaluative change of state'. This leads to the subsystem presented in Figure 8.4.7.

evaluative change of state
- 70% change for the better
  - 50% improving (6.004406)
  - 50% making better (6.004407)
- 30% worsening (6.004408)

Figure 8.4.7 The system network for 'evaluative change of state' Processes

8.4.4.3.3 'Cooking' Processes

The next subsystem is for 'cooking', and leads to further subsystem presented in Figure 8.4.7:

cooking verbs
- 70% cooking as such (6.002511)
- 0.1% overcooking (6.004411)
- 4.9% cooking in liquid …
- 17% cooking in oven …
- 8% cooking by direct heat …

Figure 8.4.7 The system network for two-role 'cooking' Processes

The first choices of 'cooking' and 'overcooking' lead directly to their respective realization rules[99]. The other systems lead to subsystems for generating the troponyms of 'cooking'. 'Cooking in liquid' has further subsystems of 'cooking in water' (for generating 'blanching', 'boiling', 'coddling', 'poaching', etc.), 'cooking in oil' (for generating 'frying', 'deep-frying', 'sauté-ing', 'stir-frying', etc.) and 'cooking in juices' (for generating 'stewing' and 'pot-roasting'). 'Cooking in oven' leads directly to a choice between verb senses such as 'baking', 'braising', 'roasting', etc. And 'cooking by direct heat' leads to a choice between verb senses such as 'barbecue-ing', 'crisping', 'toasting', etc.

[99] Note here that the realization rule for 'cooking' is the same as the realization rule in the 'one role', 'affected only' system.

8.4.4.3.4 'Changing consistency' Processes

The next subsystem is 'changing consistency', and leads to the Processes 'eating away at', 'reducing', 'firing', 'dissolving' and 'freezing'. This relatively small group of 'two-role' verb senses compares with the large system for 'one-role' 'change in basic consistency' and its numerous subsystems, as presented in Section 8.3.2.1.4.

8.4.4.3.5 'Changing quality' Processes

The next system is for all the Processes that refer to situations in which someone changes the 'quality' of something. This system has several further subsystems, and Figure 8.4.8 presents these. The system for 'change quality' also allows for the direct generation of 'levelling', 'dirtying', 'steadying', 'standardizing' and 'steepening'.

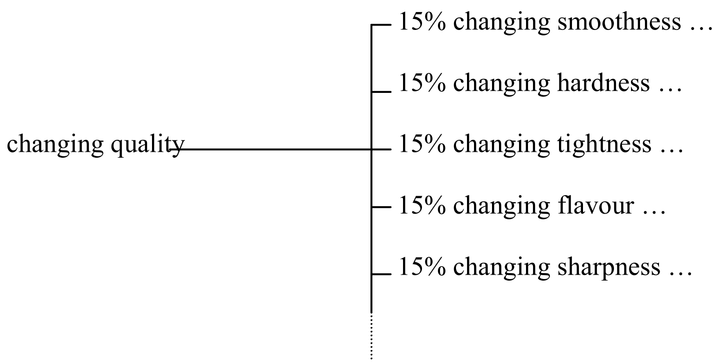

Figure 8.4.8 The system network for 'changing quality' Processes

The first 'changing quality' subsystem is 'changing smoothness' which leads to the Process 'roughening', or allows for entry to the subsystem 'making smooth', which then leads to 'ironing', 'smoothing', 'levelling' and 'rolling'.

The next subsystem is for 'changing hardness' which leads to a choice between 'hardening as such' and 'softening as such', which respectively generate the Processes 'hardening' and 'softening'.

The next system – 'changing tightness' – leads to a choice between a subsystem of 'making slack' and 'tightening as such'. The subsystem leads to the Processes 'slackening' and 'loosening'.

The next system for 'changing flavour' leads to the Processes 'salting', 'sweetening', 'browning' and 'flavouring'.

And the last 'changing quality' subsystem is for generating two verb senses of the type 'changing sharpness', and these are Processes are 'sharpening' and 'blunting'.

8.4.4.3.6 'Changing size' Processes

This system is self explanatory in its name. It leads to two sub-choices: 'increasing size' and 'decreasing size', with 'increasing size' leading to Processes such as 'enlargening', 'increasing', 'inflating', 'lengthening', 'fattening', etc, and 'decreasing size' leading to Processes such as 'bringing down', 'cutting back', 'decreasing', 'lessening', 'thinning', etc.

8.4.4.3.7 'Changing number' Processes

This system leads to verb senses that involve an Agent altering the number or amount of something. The following Processes are generated through this system: 'splitting', 'dividing', 'breaking up', 'dividing up', 'doubling', 'tripling', 'trebling' and 'quadrupling'.

8.4.4.3.8 'Changing temperature' Processes

As with the system for 'changing size', this system allows for changing temperature in two directions: either 'increasing' or 'decreasing'. And, as one would expect, the 'increasing temperature' system leads to the Processes 'heating', 'heating up', 'overheating', 'warming', 'warming up' and 'warming through', and the 'decreasing temperature' system leads to the Processes 'cooling', 'cooling down' and 'chilling'.

8.4.4.3.9 'Changing speed' Processes

Again, this system involves an 'increase'/ 'decrease' choice, with the system for 'increasing speed' leading to the Processes 'speeding up', 'quickening', ‘hastening’ and ‘hurrying’, and the system for ‘decreasing speed’ leading to the Processes ‘slowing down’, ‘decelerating’ and ‘slowing up’.

8.4.4.3.10 ‘Changing strength’ Processes

‘Changing strength’ is the last system in this group to involve the ‘increase’/ ‘decrease’ division of choices, with the subsystem for ‘increasing strength’ allowing for a choice between the Processes ‘strengthening’ and ‘toughening’, and the subsystem for ‘decreasing strength’ allowing for the Processes ‘dulling’, ‘killing’ and ‘weakening’.

8.4.4.3.11 ‘Changing fullness’ Processes

This system leads to the Processes ‘filling’, ‘filling in’, ‘filling out’, ‘filling up’, ‘emptying’ and ‘draining’.

8.4.4.3.12 ‘Changing appearance’ Processes

The verb senses generated through this system pertain to physical appearance, and they require some human perception of that appearance to determine that such a change has occurred. The Processes in this system are ‘blurring’, ‘colouring’, ‘colouring in’, ‘fading’, ‘inking’, ‘lightening’ and ‘shading in’.

8.4.4.3.13 ‘Changing consciousness’ Processes

This system of ‘material action’ verbs involves the situation types in which an Agent ‘does something’ to an Affected that causes a change in consciousness. This system therefore generates the Processes ‘awakening’, ‘waking’, ‘knocking up’, ‘bringing round’, ‘bringing to’, ‘sending to sleep’, ‘knocking out’ and ‘laying out’.

8.4.4.3.14 Changing dryness Processes

The next ‘change of state’ system simply involves variations between the states of ‘wetness’ or ‘dryness’. The generated through this system are ‘wetting’, ‘drying’, ‘drying up’, ‘watering’, ‘damping’ and ‘dampening’.

8.4.4.3.15 Shaping Processes

This next system leads to a large number of senses that – unlike the last system – are not substance or entity specific. They all involve some kind of 'shaping', but the verb sense differs according to manner involved and the substance/entity involved. The Processes that this system generates are 'shaping', 'arching', 'coiling', 'curling', 'curving', 'beating', 'bending', 'bending over', 'bending round', 'working', 'creasing', 'crinkling', 'folding', 'folding over', 'flattening', 'flattening out', 'forming', 'pulling apart', 'straightening', 'straightening out', 'twisting', 'twisting over' and 'wrinkling'.

8.4.4.3.16 Developing Processes

The final 'change state' subsystem is for the Processes that pertain to 'developing' something in some way. These Processes are 'developing', 'aging', 'bringing on', 'building up' and 'growing'.

8.4.4.4 'Preparation' Processes

The next system in the network for 'material action' Processes is the surprisingly large system for different types of 'preparation', and its four main subsystems are presented in Figure 8.4.9.

- preparing
  - 30% preparing as such
    - 80% preparing (6.004601)
    - 0.5% binding (6.004602)
    - 0.5% breaking in (6.004603)
    - 0.5% composing (6.004604)
    - 0.5% curing (6.004605)
    - 8% setting out (6.004606)
    - 5% laying out (6.004607)
    - 5% putting out (6.004608)
  - 30% bodily preparing
    - 2% bathing (6.004610)
    - 2% batheing (6.004611)
    - 58% washing (6.004612)
    - 2% dressing (6.004613)
    - 2% undressing (6.004614)
    - 2% shaving (6.004615)
    - 20% showering (6.004616)
    - 2% body part specified
      - 70% brushing (6.0046101)
      - 25% combing (6.0046102)
      - 5% flossing (6.0046103)
  - 30% domestic preparing
    - 2.5% brushing (6.004620)
    - 15% cleaning (6.004621)
    - 5% cleaning up (6.004622)
    - 5% clearing (6.004623)
    - 2.5% clearing out (6.004624)
    - 2.5% clearing up (6.004625)
    - 2.5% doing out (6.004626)
    - 5% dusting (6.004627)
    - 10% hoovering (6.004628)
    - 2.5% polishing (6.004629)
    - 2.5% rubbing (6.0046210)
    - 2.5% shining (6.0046211)
    - 15% washing (6.0046212)
    - 2.5% wiping (6.0046213)
    - 2.5% wiping out (6.0046214)
    - 2.5% wiping up (6.0046215)
    - …
  - 10% food preparing
    - 5% skinning (6.004631)
    - 5% beating (6.004632)
    - 5% bottling (6.004633)
    - 5% buttering (6.004634)
    - 5% dressing (6.004635)
    - 10% grating (6.004636)
    - 10% peeling (6.004637)
    - 10% slicing (6.004638)
    - 5% smoking (6.004639)
    - 5% shelling (6.0046310)
    - 10% whipping (6.0046311)
    - 10% whisking (6.0046312)
    - 5% liquidizing (6.0046313)
    - 5% stuffing (6.0046314)
    - 5% mincing (6.0046315)

Figure 8.4.9 The system network for ‘preparing’ Processes.

The first subsystem is for the various general senses of 'preparing'. These Processes are 'preparing', 'binding', 'breaking in', 'composing', 'curing', 'dressing', 'setting out', 'laying out' and 'putting out'.

The second subsystem is for verb senses that are specific, and refer to preparing types that involve the body. The feature for 'bodily preparing' has a 'same pass' rule attached to it that changes probabilities, as described in Section 4.2.4 of Chapter 4. This rule changes the probabilities in the PARTICIPANT ROLE system to allow for the likelihood of the 'Affected' entity typically being covert when it refers to the same entity as the Subject/Agent, as in *He hasn't showered yet*.

The Processes in this system are 'bathing', 'batheing', 'washing', 'dressing', 'undressing', 'shaving', and 'showering'.

This system also has a subsystem which leads to 'body-part specified' Processes, and these Processes are 'brushing', 'combing' and 'flossing', which necessarily involve either 'hair' or 'teeth' as the Affected entity.

The third subsystem is that of 'domestic preparation', which includes some of the same verb FORMS as the 'bodily preparing' system. However, this system leads to a different SENSE of the form. Thus, the verb *wash* has the same realization rule in both systems, but must be generated in both systems because there are two senses of wash. This is born out by the fact that the 'domestic preparing' sense of *wash* does not need a SP rule attached to it in the system, as the default probabilities for the Affected entity are suitable for this system.

The Processes generated through this system are 'brushing', 'cleaning', 'cleaning up', 'clearing', 'clearing out', 'clearing up', 'doing out', 'hoovering', 'polishing', 'rubbing', 'shining', 'washing', 'dusting', 'wiping', 'wiping out', 'wiping up', 'wiping down', 'washing out', 'washing up', 'washing down', 'sweeping', 'sweeping out', and 'sweeping up'.

The final 'preparing' subsystem is 'food preparing'. These Processes form a specific set because they all have very specific meanings pertaining to food preparation. And while a verb such as *slicing* may be used in other domains, the decision was taken that its core sense is most typically some kind of food preparation, and the other uses are semi-metaphorical extensions of this.

The Processes generated through this system are 'skinning', 'beating', 'bottling', 'buttering', 'dressing', 'grating', 'peeling', 'slicing', 'smoking', 'shelling', 'whipping', 'whisking', 'liquidizing', 'stuffing' and 'mincing'.

8.4.4.5 'Ingestion' Processes

It might appear that there is a logical progression from 'food preparation' to the system for 'ingestion' type verbs, but these two groups are quite distinct from each other. Indeed, they are systemically separate, as they occur at different steps in delicacy in the 'two-role' 'agent plus affected' network. The 'ingestion' system is split into two subsystems: (1) 'ingesting as such' (2) 'ingesting food' and (3) 'ingesting liquid', and the subsystems generate the following senses: (1) 'swallowing', 'ingesting', 'digesting', 'taking in', 'throwing down', 'throwing back', 'putting away' and 'knocking back' (2) 'eating', 'chewing', 'masticating', 'devouring', 'feeding on', 'nibbling' and 'picking at', (3) 'drinking', 'quaffing', 'sipping', 'sucking', 'lapping up', 'washing down' and 'swigging'.

8.4.4.6 'Concealment' Processes

The system network for 'concealment' Processes leads to two subsystems: 'concealing' and 'revealing'. The 'concealing' system leads to a semantically related group of verb senses, which are 'concealing as such'. These Processes are 'burying', 'covering', 'cutting out', 'hiding', 'shading', 'screening', 'stopping', 'veiling' and possibly 'harbouring', 'barring' and 'bottling up'.

The 'revealing' system leads to a much smaller semantically related group, which leads to 'revealing as such', 'blowing', 'showing' and 'baring'.

8.4.4.7 'Changing position' Processes

The next 'material action' type Processes to be generated in the system network are 'changing position' Processes. This group initially seems to belong in the system for 'directional' verbs, as there is a change in location – and, as we saw in Section 5.5 of Chapter 5 and as we shall see below, this is the defining criterion for 'directional' Processes. However, on close inspection of these verb senses, and in comparison with the verb senses generated through the system network for 'directional' Processes, this group seems to be better generated through the 'action' system. The reason for this is that in Processes of 'direction', one of the PRs must express a ‘direction’, of the type Destination, Source or Path. It will become clear as we explore the system for ‘changing position’ verb senses that the roles involved with these Processes are Agent and Affected, and not ‘direction’.

The initial system for change of position is presented in Figure 8.4.10.

changing position ——
- 40% relative to opening in enclosure …
- 40% relative to upright state …
- 10% removal of closing device …
- 9% with inherent direction …

Figure 8.4.10 The system network for generating ‘changing position’ Processes.

The first choice in this system – ‘relative to opening in enclosure’ – leads to a further choice between ‘opening’ and ‘closing’. The choice ‘opening’ leads to the verb senses ‘opening as such’ (for the opening of a box or cupboard, etc), and the other ‘opening’ Processes are ‘releasing’, ‘forcing open’ and ‘throwing open’. This contrasts with the sense of ‘open’ to be introduced below, and so also with the ‘affected only’ sense that we met in Section 8.3.2.1.1, where the ‘affected only’ sense involves restrictions as to what type of entity the ‘affected’ can be. The differences and similarities between all these senses have been widely discussed in the literature, from Fillmore (1968) onwards. ‘Open’ is a high frequency verb, with 14,600 occurrences in the large 329 million word COBUILD corpus. In contrast with ‘opening’, the choice ‘closing’ leads to the verb senses ‘closing as such’, and so the Processes ‘shutting’, ‘drawing’, ‘shutting up’, ‘putting to’ and ‘pulling to’.

The next choice in the system is ‘relative to upright state’, and this subsystem leads to the Processes ‘knocking over’, ‘upsetting’, ‘felling’, ‘upending’ and ‘kicking over’.

Next in the system is the choice ‘removal of closing device’, which leads to the ‘opening’ of doors, etc. This is to be contrasted with the above sense, and with its equivalent ‘Affected only’ sense, e.g. *The door opened slowly*. The Processes in this system are ‘opening’ (which has the same realization rule as that for the other senses of ‘opening’), ‘cracking open’, ‘twisting off’ and ‘removing’.

And the final subsystem in the 'change position' system network is 'with inherent direction', which leads to a choice between 'typically vehicle wise' and 'typically pursuit wise'. The system for 'typically vehicle wise' leads directly to the single verb sense *back up*, which is the sense of this verb that is used exclusively for vehicle-like Affected entities. The system for 'typically pursuit wise' leads to the Processes 'pursuing as such', 'getting after', 'following', 'going after', 'tracking', 'running after', 'coming after', 'coming for' 'making after' and perhaps 'being after'.

8.4.4.8 'Using' Processes

The final subsystem in the 'two-role', 'agent plus affected', 'action' Process system network is that of 'using' verbs. This system network is relatively small in comparison to the large systems we have seen in the sections above. However, several of the verbs in this system occur with a very high frequency, with the verb form 'use' occurring 56,176 times in the 329 million word COBUILD corpus [100].

This subsystem is split into three further systems, as presented in Figure 8.4.11:

using verbs — 0.5% beginning to use …
90% using as such …
9.5% using completely …

Figure 8.4.11 The system network for 'using' Processes.

The system 'beginning to use' currently leads to only one Process; 'breaking into', as in *He broke into the sugar*, so may well be redundant. The system of 'using as such' leads to the Processes of 'using', 'drawing on', 'running down', 'running off', 'running on' and 'swallowing up'. And the system of 'using completely' leads to 'using up', 'getting through', 'finishing', 'finishing up', 'finishing off', 'being through' and 'running out of'.

[100] Another valuable source of frequency information is Leech, Rayson and Wilson (2001), whose publication of word frequency lists is based on the British National Corpus, and which records the verb 'use' to occur 1071 times per 1 million words, which is a much larger figure than found in the COBUILD corpus.

This description of this huge area of TRANSITIVITY, which is a major part of the network in terms of the number of 'tokens' found in texts and 'types' found in the lexicogrammar, has had to be limited in many respects, due to the limitations of time and space in this thesis. The purpose of this section has been to attempt to provide the reader with a broad overview of a generative classification for a very large number of Processes – and in doing this, we have unfortunately had to limit comments and references to the literature of this vast field quite strictly. Indeed, each semantic domain could, in principle, be the subject of a whole book, as various works have shown. The next section of this chapter will proceed to describe the system network built for a third large area of TRANSITIVITY.

8.5 The system network for 'three role', 'directional', 'relational' Processes

In Chapter 5, Section 5.5, I introduced the relatively recent addition to the Cardiff Grammar system for TRANSITIVITY that the next section will present in detail: the 'directional' Process type. This Process type has so far not been publicly documented in the literature about the Cardiff Grammar[101], however, I should state that the system network described in this section is based on the system network developed by Fawcett for the GENESYS lexicogrammar in the COMMUNAL project in 1989. This unpublished network is the implementation of Fawcett's 1987 model, and therefore does not include 'directional' Processes, but instead includes 'change of location' type Processes. However, despite the change in terminology, the same semantic space is covered in the present system network.

While the system network that I will describe in this section builds on Fawcett's original system network, it extends it significantly, so demonstrating how corpus based data that represents a full coverage of this frequently used area of meaning enables us to produce a much more delicate classification, and so a more complete system network.

[101] The most in-depth description of the Cardiff Grammar model for 'relational' Processes is Fawcett (1987), which includes 'directional' Processes with 'locational' ones; however, this is soon to be replaced with Fawcett (forthcoming a).

In the CG, the PRs are generated in a separate system network to the PROCESS TYPE network[102], with which we have so far been concerned in Sections 8.3 and 8.4. For the three-role Process that we are now considering, we will for a moment step outside the PROCESS TYPE system network (i.e. generating meaning realized in the lexis) to consider how the third PR of 'direction' is to be generated (i.e. generating meaning realized in the structure).

Figure 8.5 reminds us which part of the system network for TRANSITIVITY we are currently considering. The choices we have made to reach this point are [relational], [directional] and [directional plus third party agent].

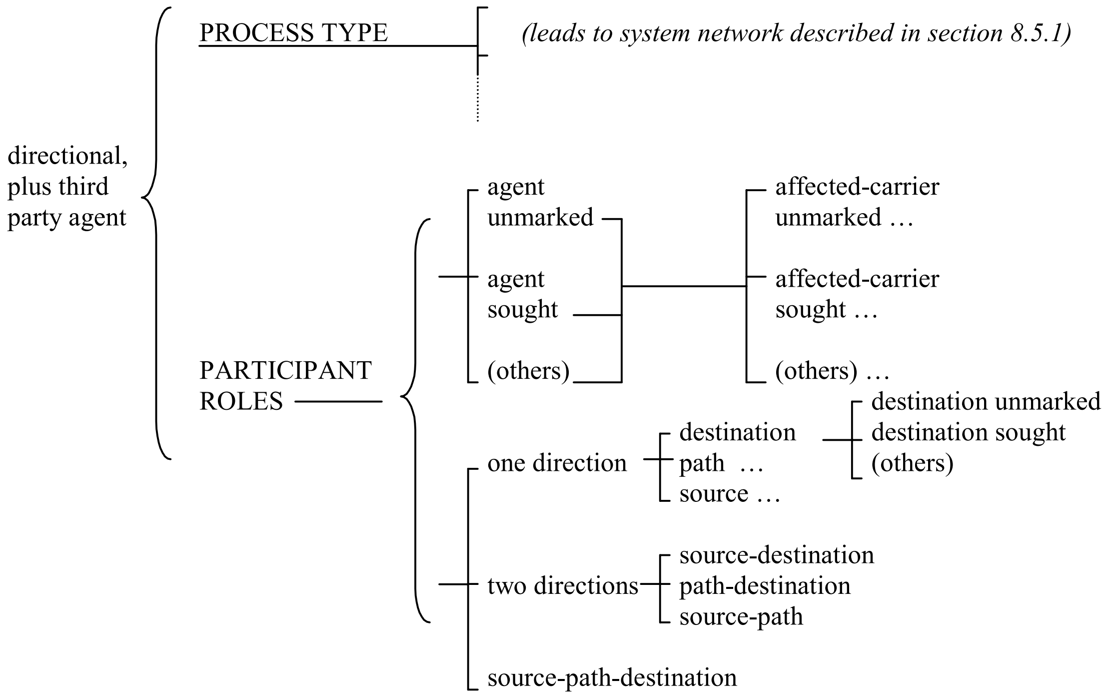

Figure 8.5 The system network for generating the Participant Role of 'direction'.

Figure 8.5 illustrates how the lower part of the PARTICIPANT ROLES system network provides for the PR type 'direction'. What is not specified in Figure 8.5, however, is that each choice of direction type (either one, two or three directions, of the three types as shown in the network) leads to a further network where 'overt direction' or 'covert direction' must be chosen. And if 'overt direction' is chosen, then the next choice is between 'deictically recoverable place', which leads to re-entry

[102] The overall system for TRANSITIVITY in the CG is presented in Chapter 6, and this area of the network for PR and PROCESS TYPE is covered there.

to the system network to generate *here, over there, in the corner,* etc, (which are treated as a type of NOMINAL GROUP), or 'direction specified', which leads to re-entry to the system network to generate a PREPOSITIONAL GROUP such as *to London*. As you can see, the upper part of the Participant Roles system network consists of a system that is essentially the same as the one for Agent and Affected that we encountered in Section 6.3 of Chapter 6. Here, however, the choices between 'sought', 'referring out' and 'covert' relate to an Agent and Affected-Carrier, so that a typically product of this system network is Example 1.

(1) Belle [Agent] drove [Process] Sebastian [Affected-Carrier] to the station [Destination].

Our focus here, however, is on the network for PROCESS TYPE, so I shall not discuss the PARTICIPANT ROLES further.

We can now turn to the system for generating Processes of the type 'directional plus third party agent'.

8.5.1 The initial choices in the system network for generating 'three-role', 'directional', 'relational' Processes

The system begins with a simultaneous choice, as shown in Figure 8.5.1.

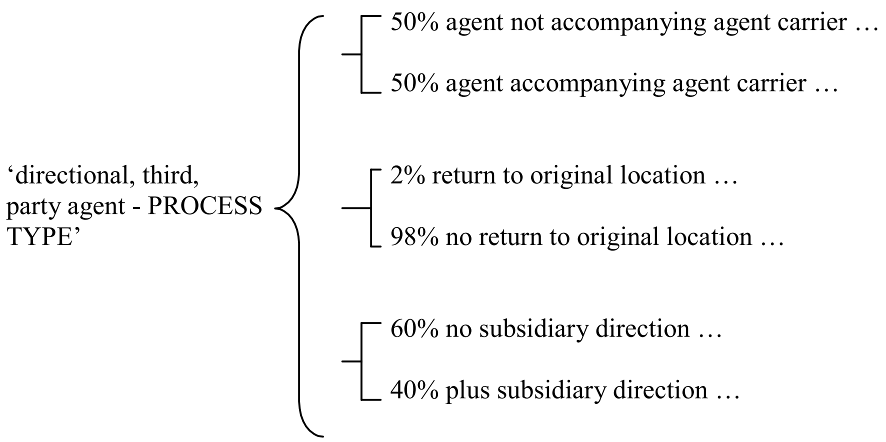

Figure 8.5.1 The initial choices in the 'three role, directional' Process system network

Let us consider the lower two systems first. The purpose of the system ‘return to original location’ vs. ‘no return to original location’ is to generate ‘back’ as a Main Verb Extension (MEx), as in example (1).

(1) Belle drove straight back to the station.

Thus, if the choice ‘return to original location is made’ an MEx will be generated, and this will be filled by ‘back’.

This ‘second’ simultaneous choice allows us to capture a generalisation in the system network[103]. Very many of the ‘directional’ Processes generated through this system network can occur with the item *back* functioning as part of the Process being referred to (i.e. *take out – take back out*, or *push down – push back down*), as a Main verb extension (MEx). I suggest that the function of *back* in examples such as these is to express the meaning of ‘return to original location’. By recognising this generalisation very early on in the system network for ‘three role’, ‘directional’, ‘relational’ Processes, we can avoid having additional systems at many places in the network for generating *back*. Thus, if the choice ‘return to original location’ is made, an MEx will be generated, and this will be filled by ‘back’.

However, there are some Processes, such as ‘extracting’, which are generated through this system network but which do not occur with ‘back’ in this way. In these instances, which are the exception rather than the norm, there will be a ‘SP’ rule that prefers ‘no return to original location’ with a probability of 100%.

The purpose of the third system – ‘no subsidiary direction’ and ‘plus subsidiary direction’ – is to allow for the choice of Process type to have an accompanying ‘MEx’ other than ‘back’. The verb senses generated through the system network for ‘three role’, ‘directional’, ‘relational’ have a high probability of occurring with an MEx of this type. Such an MEx will specify an additional direction that is not expressed by a) the Process, or b) the Participant Role. This subsidiary system therefore leads to all the direction possibilities that might be realized by the third MEx: *in, out, up, down, on, off*, etc.

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[103] See Chapter 6, Section 6.1.2 for a description of simultaneity and dependency in the system network.

However, if ‘return to original location’ or ‘continuing in same direction’ is chosen, a SP rule changes the probabilities in this third system so that the probability of selecting ‘plus subsidiary direction’ is much reduced. In this way the slight oddness of example (2) is expressed in the grammar.

(2) Belle drove Sebastian back down to the station.

We turn now to the modelling of preferences for the higher network, i.e. the one that specifies the Main Verb. Nearly all the options in this network require a SP rule that states what the preferences in the lower networks should be. For example, we know from corpus studies that *push* and *pull* occur frequently with associated MEx’s of direction, as in *He pushed me over*[104]. However, the networks must also account for the fact that not all Main Verbs occur with all MEx’s. For example, there must be a rule to specify that if *put* is to be generated as the Main Verb, then the MEx *along* must not be allowed to occur. The alternative to this would be to specify the array of possible types of ‘subsidiary direction’ for each Process type instead. It is not clear which would be the simpler/most fruitful method, but from the viewpoint of both the developer of the grammar and the user of the system networks for text analysis, the approach described here

8.5.1.1 The system network for ‘agent not accompanying affected carrier’

The choice between ‘agent not accompanying the affected carrier’ and ‘agent accompanying the affected carrier’ is again a choice between two semantic types. I will first present the system for ‘agent not accompanying affected carrier’.

The first choice in this system is between ‘distance implied’ and ‘no distance implied’. ‘Distance’ implied’ allows for the Processes which only occur over a large distance, for example, as Figure 8.5.2 shows, ‘mailing’ and ‘shipping’. This group contrasts with ‘no distance implied’, which we shall come to shortly.

[104] Table 7.4 in Chapter 7 demonstrate the results of the search results for *push* and *pull* in a sample of 50 lines of corpus examples from the British National Corpus (BNC) online.

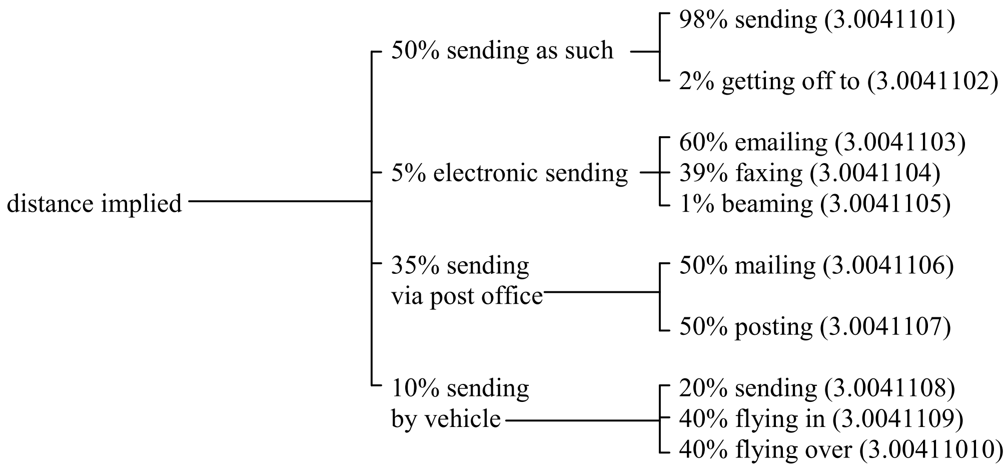

Figure 8.5.2 The system network for 'distance implied' Processes

Figure 8.5.2 shows that the system for 'sending as such' leads to *sending* and *getting off to.* And the choice of 'getting off to' requires an attached SP rule that will state that, if this choice is made, then the choice of 'subsidiary direction' should not be allowed.

The system for 'sending via post office' leads to the verb senses 'mailing' and 'posting', and this system should have a 'preference rule' stating that if 'American English' has been chosen in the system for DIALECT, then the probabilities for the choice of Main Verb should prefer *mail*, but if 'British English' has been chosen, then the probabilities for the choice of Main Verb should prefer *post*.

If the choice 'no distance implied' has been chosen, then a subsystem is entered, as shown in Figure 8.5.3.

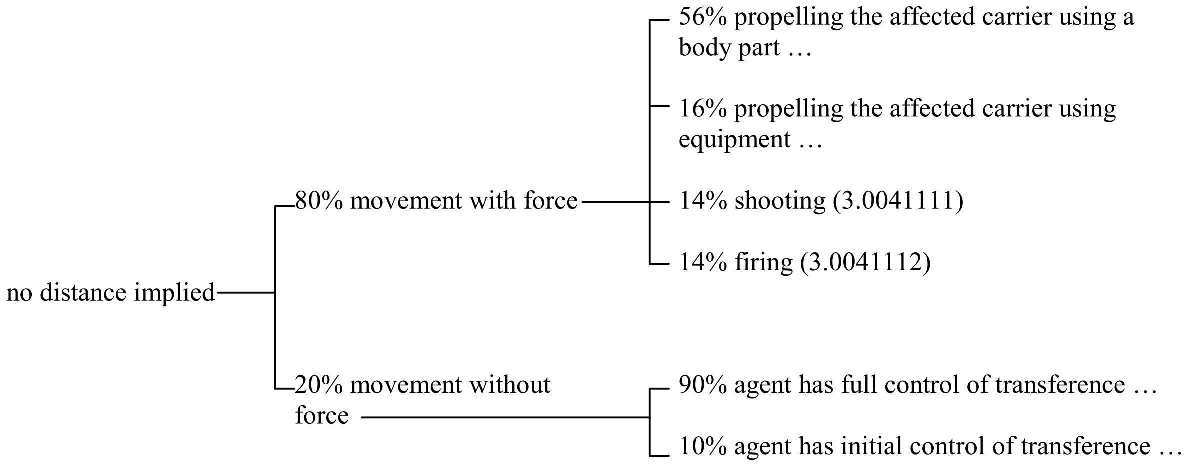

Figure 8.5.3 The system network for 'no distance implied'.

Within the system for 'movement with force', if 'propelling the affected carrier using a body part' is chosen, then another system will be entered for the specification of the body part. The choices in this system are 'typically using arm', 'typically using foot', and 'typically using any body part'.

'Typically using arm' leads to a choice between 'affected carrier controlled throughout', which will allow for 'pushing' to be generated as the Main Verb, and 'affected carrier initially controlled', which will allow for 'throwing' to be generated as the Main Verb. 'Typically using foot' will allow for 'kicking' as the Main Verb. And 'typically using any body part' will allow for 'pressing' as the Main Verb.

The choice 'propelling affected carrier using equipment' will allow for 'pumping' as the Main Verb. And the other choices in the system lead directly to the 'movement with force' verb senses 'shooting' and 'firing'.

The choice of 'movement without force' leads to the system network presented in Figure 8.5.4:

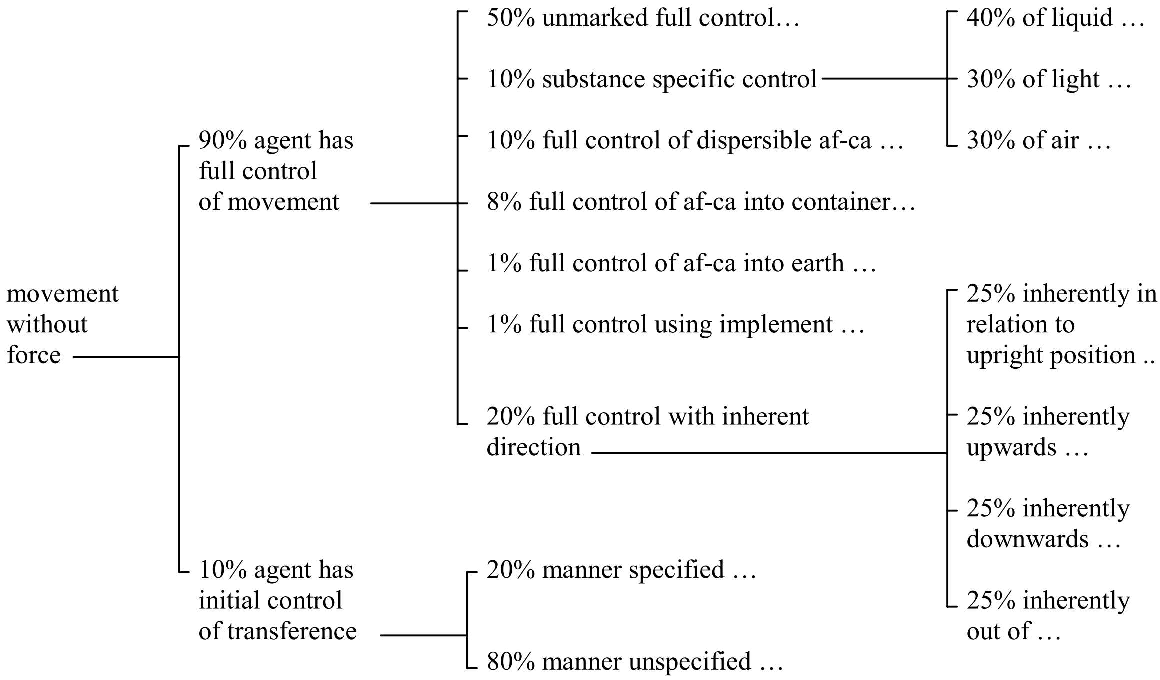

Figure 8.5.4 The system network for 'movement without force'

The subsystem for 'unmarked transference' leads to the Processes 'putting', 'placing', 'setting', 'moving', 'sticking', 'spreading' and 'transferring'.

Within the system for 'substance specific transference', the choice 'of liquid' leads to the Processes 'pouring', 'flooding', 'squirting' and 'spurting'. The choice 'of light' leads to the Processes 'beaming', 'shining' and 'glaring'. And the choice 'of air' leads to the verb senses 'blowing' and 'breathing'.

The subsystem for 'dispersible transference' leads to the Processes 'piling', 'scattering' and 'raining'.

The subsystem for 'transference into container' allows for the Processes 'packing' and 'packing up'. The choice 'packing up' has a SP rule attached to it, which specifies that 'no specific direction' should be chosen.

The system for 'transference using implement' leads to the verb senses 'pinning', 'nailing' and 'sweeping'.

And finally, the subsystem choices for ‘transference with inherent direction’ leads to the system presented in Figure 8.5.5.

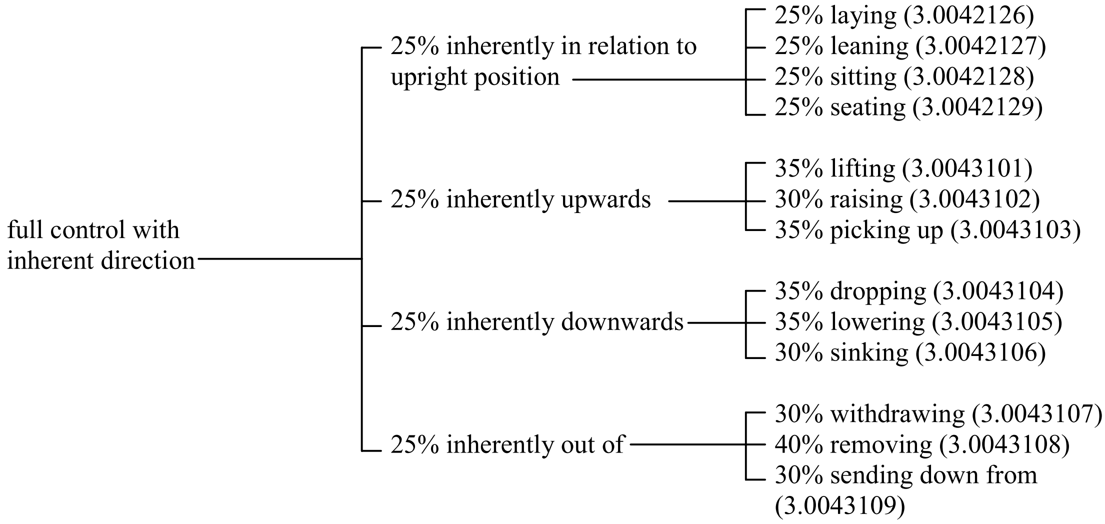

Figure 8.5.5 The system network for ‘transference with inherent direction’ Processes.

The system for ‘manner specified’ leads to the Processes ‘twisting’, ‘rolling’, ‘threading’, ‘spinning’, ‘shaking’ and ‘sliding’, and the system for ‘manner unspecified’ leads to the Processes ‘passing’, ‘casting’ and ‘turning’.

8.5.1.2 The system network for ‘agent accompanying affected carrier’

Having considered all of the options in the system for ‘agent not accompanying affected carrier’, we will now look at the system for ‘agent accompanying affected carrier’, as presented in Figure 8.5.6.

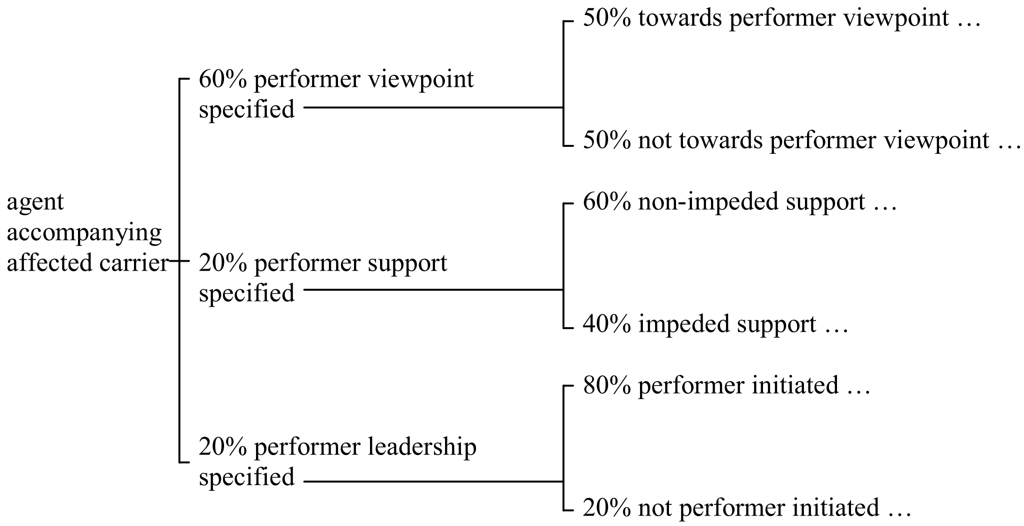

Figure 8.5.6 The system network for 'agent accompanying affected carrier'

In the first system in Figure 8.5.6 the choice 'towards performer viewpoint' leads to the very high frequency verb sense 'bringing', so introducing a deictic element to the semantics of the verb. The choice 'not towards performer viewpoint' leads to a further choice between 'unimpeded movement' and 'impeded movement'. The system for 'impeded movement' leads to the Processes 'getting' and 'picking out of'. And the system for 'unimpeded movement' leads to the very high frequency Process 'taking', and also 'delivering', 'tearing', 'extracting', 'removing' and 'fishing out'. These last four verb senses require an associated SP rule to specify that in the 'same pass', but in the system for Participant Role, the probabilities for these Main Verbs should prefer the PR involved to be Source (rather than Destination or Path). The system network for 'direction' requires SP rules similar to this to occur at various places, since this Process type allows these three different types of PR to occur as the third PR in the Process.

As with the choice 'not towards performer viewpoint', the choice 'performer support specified' leads to a choice between 'non impeded support' and 'impeded support'. And the choice 'non impeded support' leads to the Process 'carrying', while the choice 'impeded support' leads to the Processes 'dragging' and 'pulling'.

The final choice in the 'agent accompanying affected carrier' system is for 'performer leadership specified'. This leads to a choice between 'performer initiated pls (performer leadership specified)' and 'not performer initiated pls'. The choice of 'not performer initiated pls' leads to the Processes 'heading', 'leading', 'guiding', 'drawing' and 'hurrying'. And the choice of 'performer initiated pls' leads to the Processes 'marching', 'running', 'rushing', 'steering', 'walking', 'flying', 'driving', 'riding', 'seeing', 'showing', 'galloping', 'trotting', 'backing up', 'reversing' and 'sailing'. I should point out that it is in this system network that the verb 'march' is generated, because 'march' is the Main Verb in Halliday's well-known example in his paper 'Notes on Transitivity and Theme Part 1' (1967) of an 'action' Process, as Example (1) shows[105].

(1) He marched the prisoners.

From the viewpoint of the CG model, Halliday's example sounds rather odd, and it can only be interpreted as having a covert third role of 'direction'. In other words verb sense is generated in this system for 'agent accompanying affected carrier, 'performer leadership specified', rather than being a two-role Process, as Halliday suggests.

8.6 Conclusion

In this Chapter I have provided a broad overview of three very large areas of the system for TRANSITIVITY, moving from the relatively general 'Process type' categories to the most delicate of choices between meanings realized as lexical items.

As a conclusion to this chapter I would like to reiterate that what this chapter provides is an illustration of how it is possible to move from an unstructured body of lexical data to a semi-structured classification of Processes according to Process Type and Participant Role configuration, to ultimately reach a fully semantically structured system network for the realization of 'lexis as most delicate grammar'.

This chapter therefore serves as an illustration of how the data that I have collected and compiled in the form of the PTDB contributes significantly to the development of a model of language for generating clauses. By using such data, I have been able to produce very delicate system networks for generating the Main Verb (and its Extensions, etc.) based not on introspection and guesswork, but on real

[105] Halliday 1967 was described in detail in Chapter 3, Part 1.

corpus evidence that is derived from real language use. Thus, the system networks presented in this Chapter make a considerable contribution towards the massive task of building a full generative model that represents real language use.

9: Conclusions

The final chapter of the thesis provides a summary and an evaluation of the research. The first section focuses on the contribution of this research to the Cardiff Grammar, and on the way in which it has demonstrated the value of using corpora in extending its scope. The second section describes the products of the research and their applications, namely the Process Type DataBase (PTDB) described in Chapter 7 and presented in full in Appendix A, and the three major system networks, described in Chapter 8 and presented in Appendix B. The third section discusses some of the limitations of the thesis – primarily limitations of time in the research and space in presenting it in thesis form, but also methodological and theoretical limitations. The final section of the chapter suggests some implications for future work.

9.1 What has this thesis demonstrated?

This thesis has demonstrated that it is (a) possible and (b) desirable to extend the 'scale of delicacy' to realize 'lexis as most delicate grammar' (Halliday, 1961). In modelling language as meaning potential in a system network we necessarily move from the general to the specific, and it is the more specific that is the 'more delicate'. The thesis has also demonstrated the need to recognize that the key notion in system network relations is not **delicacy**, but **dependency**; the most delicate choices are typically the most dependent ones.

Without this notion of dependency it would have been quite impossible to create the systems and subsystems for the areas of TRANSITIVITY. The research reported in this thesis creates the system networks by extending the lexicogrammar both out of the grammar and into the lexis, and out of the lexis and into the grammar. In other words, at times the current CG framework was used to create subsystems within each Process type and at other times lexical data were used to create semantic groupings, which ultimately came to be reorganized as intermediary 'subsystems' in the system networks (e.g. the 'matching' Processes described in Chapter 5). This way of working has become central to the Cardiff Grammar approach, and it has been discussed by Tucker (1996b). The research presented in this thesis is one attempt to deal with the problem that Tucker identifies, i.e. that 'by coming at it [the nature of language] from the grammatical end we often fail to take into account what is revealed by coming at it from the lexical end' (1996b:163).

This thesis has also demonstrated the value of the notions 'systemic' and 'functional' in a SFG approach to language description, and to the analysis and generation of texts. The value of a systemic approach is that it enables us to model language on a cline of delicacy. And by using this model we can derive a functional description of each item in the language. As argued in Chapter 7, the most fruitful method for arriving at a functional description is by observing function in use: for example, in a corpus. And it is for the reasons presented in that chapter that, for example, a 'part-of-speech' analysis of a corpus, which is based on traditional grammatical classifications in terms of classes at the level of form, is less useful method for this kind of model building. This thesis has demonstrated that the semantic category of 'Process', rather than the traditional grammatical category of 'verb', allows us to describe the meaning and function of the item. It is the meanings of verbs rather than the forms of verbs that enter into specific patterns, such as complementation, and this is why word SENSE is paramount. For similar reasons, this is why West's (1953) information on the frequency of words, as described in Chapter 7, is still an important study fifty years on. It is still the only 'second level' corpus study that provides frequency information for disambiguated word senses – rather than just for grammatical categories such as 'verb', 'noun' and 'adjective'.

Tucker (1996b:175) makes the important statement that 'when evidence from data cannot be explained or modelled within the theory [then] alternative theories need to be set up'. This statement leads us to a further conclusion that can be drawn from the work presented in this thesis. The Cardiff Grammar is tested in the computer implementation of the COMMUNAL project, and this testing ensures that the CG model attends to many aspects of language which are required for the generation of language, but which might otherwise be unnoticed. But by using real data from a corpus for creating the model, we are testing the model in a different way and to an even greater degree, because we are testing its ability to be extended to the full coverage of language. This thesis has largely seen how the CG has the means to accommodate 'peculiarities' in the data. Chapter 7 demonstrated how the creation of a large and representative database can serve to draw attention to some important features in the language that must be accounted for. Firstly, the data highlighted the importance of allowing a central place for multi-word verbs in the system networks for PROCESS TYPE[106]. These highly frequent items must have an equal place in the resulting system networks to the single-word verbs, despite the well-known difficulty in accessing information about their functions and occurrences in a corpus. The second problematic area that Chapter 7 discusses is metaphor. Chapter 7 describes how instances of metaphor found in the PTDB can be handled in the system networks, either by accounting for them as new senses of a verb form (i.e. 'dead' metaphor), or as the 'extended usage' of a core verb sense.

We are thus able to conclude that this thesis has demonstrated the desirability of using corpora both to test and expand a model of language. Moreover, the thesis has demonstrated the value of the 'second level' use of corpora – that is, taking the wealth of published corpus observations, such as the COBUILD grammar, and making use of it for further language description and modelling.

9.2 What are the products and applications of this thesis?

The thesis has two main products. The first to be described in this section is in fact an unintentional by-product of the research, as originally planned.

The Process Type Database (PTDB), started life as a means for collecting data, but it has turned out to be an important research tool in its own right that has various possible uses. The PTDB is a body of data that currently includes somewhere in the region of 5,400 verb senses, each of which has been manually analysed in terms of its sense type (including one or more examples of usage), its Process type (in terms of the CG model), its Participant Role (PR) configuration (including the likelihood and degree of covertness of the associated Participant Roles), and, in many cases, its frequency information as detected in one or more corpora. This database therefore stands as a useful tool that the text analyst can consult when engaged in the notoriously troublesome task of TRANSITIVITY analysis. The PTDB is presented in Appendix A.

The second main product of this thesis is presented in Appendix B. Here, the fully delicate system networks for three major areas of PROCESS TYPE in the system for TRANSITIVITY are presented. These areas are 'action' Processes of the

[106] It did so, ironically, through its failure to identify them: in current work by Michael Day at Cardiff, this problem is being attended to.

type 'one-role', 'affected only'; 'action' Processes of the type 'two-role', 'agent plus affected'; and 'relational' Processes, of the type 'three-role', 'directional'. These system networks include the realization rule numbers and probability figures for each system and Process, and so the mechanisms for making them operational as part of the wider generative grammar that is GENESYS (the sentence generation component of the COMMUNAL project.)

While the system networks are capable of being implemented in the bigger system, we should not lose sight of the fact that they also stand as a product in their own right. They constitute a fuller description than any available elsewhere, so far as I am aware, of an aspect of English that has, I would hope, implications both for (1) systemic theory, and (2) other approaches to the area of language that we term TRANSITIVITY.

9.3 What are the limitations of this thesis?

The first limitation of the thesis is the limitation that is the inevitable corollary of one of its goals. This is the focus on breadth in a specific aspect of TRANSITIVITY over depth. In other words, the fully analysed data upon which the PTDB and the system networks presented in Chapter 8 consider only the Process type and Participant Role configurations for each Process, and they do not take into account the possible complementation patterns of a verb sense that can occur within its associated PRs. However, Fawcett (1996) has already described the means for handling the complementation patterns, and Tucker (1996b) has described the way in which various types of multi-word verbs can be generated. Furthermore, the possible patterns with which a single verb sense can occur have been given much attention by others, most notably, Francis et al (1996), and future work will involve incorporating the full range of such patterns in the GENESYS generator.

Two other types of limitation are the inevitable restrictions of time and space. The restriction of time is represented by the fact that it was only possible to build system networks for three major areas of Process type. However, as Chapter 8 demonstrates, the enormity of the task of building the system networks for even these three areas explains this limitation. In order to build fully delicate system networks for these three areas pf PROCESS TYPE – and thus 'deep' system networks based on 'broad' coverage – it was necessary to limit the areas covered in this thesis. The limitation of space is presented in the brevity of the discussion of individual verb senses and verb classes that I have been able to include in Chapter 8.

A fourth limitation of the research is that the work presented here must necessarily be 'work in progress'. No one could ever – nor should we ever want to – claim to have given a definitive account of English. The very nature of a language system is that it is dynamic and changes according to many variables (e.g. time, context, etc). While a good model should include ways of incorporating the effect of such variables (as the Cardiff Grammar does), any theory is inevitably work in progress.

Another relevant point to be made in this section is that while the research presented in the thesis is representative, it also intends to provide broad coverage. But I should point out that meeting this goal required a decision to be taken for the analysis for every single verb sense. And although we have Fawcett's criteria for defining PR types in the form of a set of tests as presented in Appendix C, the analyses I present, I would hope, will bring about further discussion. Therefore, not only does this research intend that the PTDB and the resulting system networks be used as a resource, it also intends that the products of the research will be used by others for further debate as to what kind of TRANSITIVITY analysis we want to achieve.

9.4 Pointers for future work

The most apparent future work to come out of this thesis is the need to build the system networks for the other Process types. Now that we have established the methodology for recognising semantic groups of Processes – i.e. building them 'backwards' from the terminal features that we realized as lexical verbs to produce a system network – the next phase of the research should focus on doing this for all the Process types. And we already have the core data for this in the PTDB. As this is done for each broad PROCESS TYPE it can be implemented in GENESYS, and thus their generative ability can be tested. We should be fairly confident that the Process type system networks will generate successfully because the framework for developing the system networks, which was described in Chapters 4 and 6, has been successfully implemented for other areas of the lexicogrammar. The main task will be to add appropriate 'same pass' rules, that were described in Chapter 6, to provide for appropriate choices in the PARTICIPANT ROLES part of the network, in which option in reflexive form and 'covert' roles, etc, are selected.

Other possible work that may be undertaken as a result of this thesis involves the extending and updating of the PTDB, and consequently the updating of the system networks, ad infinitum. As Chapter 8 demonstrated, the semantic nature of the system networks means that it is straightforward to make additions. In Chapter 2 we saw that Levin (1993) recognises the way in which new words in the language slot into the existing semantic and syntactic structure. In this thesis, it is the case that once the Process type and PR configurations for a new verb sense have been determined, the verb sense can be slotted into the appropriate system network by locating the appropriate sub-system in that system network. As we saw in Chapter 7, the Process type and PR configurations are derivable from the context (and/or co-text), and this is why the examples of use from the COBUILD Dictionary were so important for analysis, and why they have been included for each verb sense in the PTDB.

A final pointer for future work to come out of this thesis is the need to obtain further frequency information for the verb senses. If we had, for example, a modern version of the work of West (1953), it would enable us to derive semantic probabilities for modern English. However, as Chapter 7 showed, obtaining frequencies from a corpus for the senses of verbs is not an easy task, and it is not easy to see how it can be fully automated. I anticipate that within the next five years this will be more of a possibility than it has been during this research. The reason for this is the emergence of corpus tools for providing coherent and thorough analyses.

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Appendix A2: Guidelines for using the Process Type DataBase

The Process Type Database, which was fully described in Chapter 7 of this thesis, is supplied as an Appendix that can be viewed and searched[107].

The database is in the form of an alphabetical list. The entry for each verb sense is on a separate row in the spreadsheet, and the degrees of analysis are provided in each column. Each column provides the following:

Column A:

The first column is an alphabetical list of verb forms. This ordering enables ease of searching a particular verb sense.

Column B:

Column B provides figures of the occurrence of the verb form, as reported by West. For a more detailed description of the use of West in creating this DataBase, refer to Chapter 7. The 'occurrences of form' figures provided in this list show how frequently the verb form occurred in a corpus of 5 million words.

Column C:

The information in this column is taken from two sources. The first is from Francis et al (1996) *Collins COBUILD Grammar Patterns 1: Verbs*, and is given as either 'C0', 'C1', 'C2', 'C3', 'C4' or 'C5', which represents the Band distinctions that Francis et al recognised in their 'verb index' (see Section 7.3.1.3 of Chapter 7 for more detail), or as '-c' if the verb form does not occur in Francis et al (1996). All of

[107] The Process Type DataBase is presented as Appendix A1, and is supplied on CD-ROM, on the inside cover of this thesis. The PTDB is compiled in Microsoft Excel, and also included on the CD-ROM is a version of Microsoft Excel Viewer, which will allow those users who do not have Excel installed to view and explore the PTDB.

the C5 entries in this column also include a figure, which indicates the total number of occurrences of that verb form in the Bank of English[108].

The other source of information given in this column is Biber et al (1999), *The Longman Grammar Of Spoken And Written English.* This publication provides frequency information for 130 multi-word verb forms as they occur in a corpus of 1 million words, and all of this frequency information is given in Column C as 'Lo.n'.

Column D:

Column D provides the verb SENSE information in the form of a gloss of the meaning, and an example of use (taken from *Collins COBUILD English dictionary - 2nd ed*). This is the important information for determining how many different senses of each verb form are recognised.

Column E:

The next column provides figures for the occurrences of the verb senses. These figures are adapted from West (1953), as described in Chapter 7, and show how many times the particular verb sense occurred in his 5 million word corpus.

Column F:

Column F provides the main analysis for each verb sense. This is the most useful column for the research presented in this thesis, because it is possible to search for Process types. By using the filter facility in Excel it is possible to compile lists of all the verb senses in the PTDB that are a particular Process type. Excel 'AutoFilter' has been set up in the Database. To use AutoFilter, click on the AutoFilter arrows at the very top of the PTDB, on the right of Column F's column label. A drop down list will then appear with every option that occurs in that column. Column F starts as follows:

'all
top 10
custom
?
attributive, affected carrier
attributive, agent carrier

[108] These figures were provided Ball (work in progress).

attributive, plus 3 p Ag
attributive, simple carrier
etc…'

Clicking on an entry on this list will provide all, and only, the occurrences of that particular entry in the entire PTDB. Therefore, clicking 'two role plus affected' will provide a list of all the verb senses which formed the basis for the system network presented in Appendix B2.

Column G:

This column provides Levin's (1993) approximate analysis for all of the verb senses in the PTDB that she too considers.

Column H:

Column H provides the Participant Role (PR) configuration for each verb sense. This configuration can also be determined from the information in Column F: Cardiff Grammar Feature. However, Column H provides additional information about the likelihood of the covertness and overtness of the PRs, as described in Section 7.6 of Chapter 7.

Column I:

The final column, Column I, provides a place for any notes that needed to be recorded in the compilation and analysis of the PTDB.

Appendix B1: The System Network For One-Role, Affected Only Action Processes

/* SYSTEM NETWORK FOR 'AFFECTED ONLY' PROCESSES */

affected_only ->
5# stopping_being_af /
60# change_of_state_af /
25# involuntary_behaviour_af /
10# emission_af.

/*NB the 'stop_being' verbs contrast with 'start_being' verbs, which are 'created only'.*/

stop_being ->
60# dying (6.002221) /
10# vanishing (6.002222) /
1# expiring (6.002223) /
1# perishing (6.002224) /
28# disappearing (6.002225).

change_of_state->
20# change_of_state_as_such /
80# change_of_state_specified.

change_of_state_as_such ->
90# changing (6.002323) /
9# altering (6.002324) /
0.9# transforming (6.002325) /
0.1# metamorphosing (6.002326).

change_of_state_specified ->
40# change_by_moving /
5# change_by_cooking /
30# change_resulting_in_disintegration /
4# change_in_basic_consistency /
1# change_in_vision /
1# change_in_quality /
4# change_in_size /
1# change_in_number /
1# change_in_temperature /
1# change_in_speed /
1# change_in_strength /
1# change_in_fullness /
2# change_developmentally /
8# evaluative_change.

change_by_moving ->
30# moving_as_such (6.002327) /
30# moving_relative_to_opening_an_enclosure /
1# moving_relative_to_upright_state /
1# moving_relative_to_linear_state /
38# inherently_directional.

moving_relative_to_opening_an_enclosure ->
45# opening (6.002411)/
5# shutting (6.002412) /

40# closing (6.002413) /
5# reopening (6.002414).

moving_relative_to_upright_state ->
1# capsizing (6.002415) /
30# overturning (6.002416) /
30# toppling (6.002417) /
19# overbalancing (6.002419).

moving_relative_to_straight_line ->
30# bending (6.002421) /
50# turning (6.002422) /
2# curving (6.002423) /
2# swerving (6.002424) /
2# looping (6.002425) /
6# winding (6.002426) /
8# twisting (6.002427).

inherently_directional ->
30# upward_id /
70# downward_id.

upward_id ->
50# coming_up (6.002436) /
50# rising (6.002444).

downward_id ->
10# falling (6.002428) /
7# falling_away (6.002429) /
7# falling_back (6.002431) /
10# falling_down (6.002432) /
10# falling_off (6.002433) /
7# descending (6.002434) /
10# going_down (6.002435) /
6# plummeting (6.002437) /
7# dropping (6.002438) /
6# sinking (6.002439) /
6# nosediving (6.002441) /
6# dipping (6.002442) /
6# plunging (6.002443) /
7# lowering (6.002445).

change_by_cooking ->
50# cooking_as_such (6.002511) /
20# cooking_in_liquid /
25# cooking_in_oven /
5# cooking_by_direct_heat.

cooking_in_liquid ->
50# boiling (6.002512) /
2# hardboiling (6.002513) /
2# softboiling (6.002514) /
35# frying (6.002515) /
5# simmering (6.002516) /
2# poaching (6.002517) /
2# stewing (6.002518) /
2# saute_ing (6.002519).

cooking_in_oven ->
50# roasting (6.002521) /

50# baking (6.002522).

cooking_by_direct_heat ->
50# grilling (6.002523) /
25# barbeque-ing (6.002524) /
25# toasting (6.002525).

change_resulting_in_disintergration ->
30# total_disintergration /
69# non-total_disintergration /
1# breaking_down (6.002526).

total_disintergration ->
20# falling_apart (6.002527) /
20# falling_down (6.002528) /
3# falling_in (6.002529) /
3# disintergrating (6.002531) /
20# collapsing (6.002532) /
3# caving_in (6.002533) /
3# decomposing (6.002534) /
10# smashing (6.002535) /
3# busting (6.002536) /
5# snapping (6.002537) /
5# bursting (6.002538) /
5# shattering (6.002539).

non-total_disintergration ->
50# breaking (6.002541) /
1# breaking_up (6.002542) /
1# unravelling (6.002543) /
1# degenerating (6.002544) /
1# fragmenting (6.002545) /
1# fracturing (6.002546) /
1# rupturing (6.002547) /
8# splitting (6.002548) /
1# splintering (6.002549) /
3# crumbling (6.002551) /
8# cracking (6.002552) /
1# buckling (6.002553) /
1# warping (6.002554) /
1# chipping (6.002555) /
8# crushing (6.002556) /
4# ripping (6.002558) /
8# tearing (6.002559) /
1# dissipating (6.002561).

change_in_basic_consistency ->
20# change_from_liquid_to_solid /
10# change_from_solid_to_liquid /
10# change_from_liquid_to_gas /
10# change_from_solid_to_solid /
40# change_from_solid_to_gas /
10# non-specific_cibc.

change_from_liquid_to_solid ->
20# solidifying (6.002611) /
70# freezing (6.002612) /
5# setting (6.002613) /
0.4# congealing (6.002614) /
0.4# clotting (6.002616) /

1# curdling (6.002617) /
1# crystallizing (6.002618) /
0.2# caramelizing (6.002619).

change_from_solid_to_liquid ->
48# melting (6.002621) /
7# liquefying (6.002622) /
45# dissolving (6.002623).

change_from_liquid_to_gas ->
0.4# vaporizing (6.002624) /
15# evaporating (6.002625) /
55# drying (6.002626) /
0.4# dehydrating (6.002627) /
0.2# dehumidifying (6.002629) /
29# boiling (6.002512).

change_from_solid_to_solid ->
49# thawing (6.002632) /
49# defrosting (6.002633) /
1# tenderizing (6.002634) /
0.5# fossilizing (6.002635) /
0.5# ossifying (6.002636).

change_from_solid_to_gas->
95# burning (6.002637) /
5# incinerating (6.002638).

non-specific_cibc ->
30# hardening (6.002639) /
1# acidifying (6.002641) /
1# oxidizing (6.002642) /
1# emulsifying (6.002643) /
4# corroding (6.002644) /
15# firming (6.002645) /
30# softening (6.002646) /
15# stiffening (6.002647) /
1# depressurizing (6.002648) /
1# magnetizing (6.002649) /
1# ulcerating (6.002651).

change_in_vision ->
    2# blurring (6.002652) /
    60# clearing (6.002653) /
    2# dimming (6.002654) /
20# fading (6.002655) /
    10# fading_away (6.002656) /
4# fading_out (6.002657) /
2# fogging (6.002658).

change_in_quality ->
5# warping (6.002711) /
10# evening_out (6.002712) /
15# levelling_out (6.002713) /
5# mellowing (6.002714) /
5# roughening (6.002715) /
10# sharpening (6.002716) /
5# slackening (6.002717) /
5# steepening (6.002718) /
10# straightening (6.002719) /

5# sweetening (6.002721) /
5# tautening (6.002722) /
15# tightening (6.002723) /
5# reddening (6.002724).

change_in_size ->
50# increasing_size /
50# decreasing_size.

increasing_size ->
2# enlarging (6.002725) /
10# expanding (6.002726) /
20# growing (6.002727) /
20# increasing (6.002728) /
1# inflating (6.002729) /
1# broadening (6.002731) /
0.5# fattening (6.002732) /
5# heightening (6.002733) /
1.5# lengthening (6.002734) /
1# thickening (6.002735) /
5# widening (6.002736) /
1# snowballing (6.002737) /
1# mushrooming (6.002738) /
1# ballooning (6.002739) /
15# spreading (6.002741) /
5# swelling (6.002742).

decreasing_size->
10# compressing (6.002743) /
10# decreasing (6.002744) /
10# contracting (6.002745) /
10# shrinking (6.002746) /
10# narrowing (6.002747) /
10# thinning (6.002748) /
10# lessening (6.002749) /
10# shortening (6.002751) /
10# reducing (6.002752) /
10# diminishing (6.002753).

change_in_number ->
40# number_specified /
60# number_unspecified.

number_specified ->
80# doubling (6.002759) /
10# by_three /
10# quadrupling (6.002761).

by_three ->
50# tripling (6.002762) /
50# trebling (6.002763) /

number_unspecified ->
20# multiplying (6.002764) /
20# reproducing (6.002765) /
60# dividing (6.002766).

change_in_temperature ->
50# increasing_temperature /
50# decreasing_temperature.

increasing_temperature ->
15#	warming_through (6.002767) /
20#	warming_up (6.002768) /
8#	heating (6.002769) /
20#	heating_up (6.002771) /
30#	overheating (6.002772) /
7#	roasting (6.002521).

decreasing_temperature ->
80#	cooling_down (6.002774) /
20#	chilling (6.002775).

change_in_speed ->
50#	increasing_speed /
50#	decreasing_speed.

increasing_speed ->
2#	quickening (6.002776) /
18#	accelerating (6.002777) /
80#	speeding_up (6.002778).

decreasing_speed ->
7#	slowing (6.002779) /
20#	slowing_up (6.002781) /
70#	slowing_down (6.002782) /
3#	decelerating (6.002783).

change_in_strength ->
50#	increasing_strength /
50#	weakening (6.002784).

increasing_strength ->
60#	strengthening (6.002785) /
40#	toughening (6.002786).

change_in_fullness ->
50#	increasing_fullness /
50#	decreasing_fullness.

increasing_fullness ->
10#	filling (6.002787) /
50#	filling_up (6.002788) /
40#	flooding (6.002789).

decreasing_fullness ->
50#	draining (6.002791) /
50#	emptying (6.002792).

change_developmentally ->
40#	change_developmentally_as_such /
30#	change_developmentally_typically_creature /
30#	change_developmentally_typically_plant.

change_developmentally_as_such ->
45#	developing (6.002811) /
60#	growing (6.002727) /
5#	progressing (6.002813).

change_developmentally_typically_creature ->

10#	hatching (6.002814) /
10#	aging (6.002815) /
10#	maturing (6.002816) /
60#	growing_up (6.002817) /
10#	getting_on (6.002818).

change_developmentally_typically_plant ->
49#	sprouting (6.002819) /
49#	ripening (6.002821) /
2#	germinating (6.002822).

evalutive_change ->
50#	favourable_ec /
50#	unfavourable_ec.

favourable_ec ->
49.5#	improving (6.002823) /
50#	getting_better (6.002824) /
0.5#	ameliorating (6.002825).

unfavourable_ec ->
50#	worsening (6.002826) /
50#	deteriorating (6.002827).

involuntary_behaviour_af ->
15#	specific_physiological /
15#	reactive_physiological /
20#	psychological_af /
10#	internal_bodily_movement /
20#	change_in_awakeness /
10#	change_in_conciousness /
10#	suffocating_af.

specific_physiological ->
25#	digestion_sphys /
25#	respiratory_sphys /
25#	outward_appearance_sphys /
25#	bodily_substance_emission_sphys.

digestion_sphys ->
15#	belching (6.002828) /
20#	burping (6.002831) /
20#	hiccuping (6.002833) /
11#	farting (6.002852) /
11#	blowing_off (6.002853) /
11#	letting_off (6.002854) /
12#	passing wind (6.002855.

respiratory_sphys ->
5#	sneezing (6.002834) /
2#	sniffling (6.002835) /
2#	snoring (6.002836) /
2#	wheezing (6.002837) /
5#	yawning (6.002838) /
40#	breathing (6.002841) /
40#	coughing (6.002842) /
2#	exhaling (6.002848) /
2#	inhaling (6.002849) /

outward_appearance_sphys ->

40#	blushing (6.002829) /
5#	flushing (6.002832) /
50#	sweating (6.002846) /
5#	perspiring (6.002851) /

bodily_substance_emission_sphys ->
70#	bleeding (6.002839) /
9#	dribbling (6.002843) /
3#	drooling (6.002844) /
9#	puking (6.002845) /
9#	vomiting (6.002847) /

reactive_physiological ->
15#	cowering (6.002855) /
17#	cringing (6.002856) /
17#	flinching (6.002857) /
17#	recoiling (6.002858) /
17#	shrinking (6.002747) /
17#	wincing (6.002861).

psychological_af->
45#	breaking_down (6.002526) /
45#	cracking_up (6.0028612) /
10#	snapping (6.002537).

internal_bodily_movement ->
2.5#	convulsing (6.002862) /
2.5#	quaking (6.002863) /
7#	quivering (6.002864) /
40#	shaking (6.002865) /
7#	shivering (6.002866) /
7#	shuddering (6.002867) /
20#	trembling (6.002868) /
7#	writhing (6.002869) /
7#	twitching (6.002871).

change_in_awakeness ->
50#	to_waking_state /
50#	to_sleeping_state.

to_waking_state ->
10#	awakening (6.002872) /
90#	waking_up (6.002873).

towards_sleeping_state ->
10#	tiring (6.0028761).
90#	complete_tss.

complete_tss ->
40#	falling_asleep (6.002874) /
40#	going_to_sleep (6.002875) /
17#	dropping_off (6.002876) /

change_in_conciousness ->
50#	to_unconciousness /
50#	coming_round (6.002885).

to_unconciousness ->
35#	fainting (6.002886) /
35#	passing_out (6.002887) /

15# blacking_out (6.002888) /
14.5# collapsing (6.002532) /
0.5# dropping (6.002438).

suffocate ->
50# suffocate_as_such (6.002891) /
50# suffocate_specified.

suffocate_specified ->
10# asphyxiating (6.002892) /
45# choking (6.002893) /
45# drowning (6.002894).

emission_af ->
45# of_substance /
55# of_sound.

of_substance ->
13# bleeding (6.002911) /
12# bubbling (6.002912) /
13# dribbling (6.002913) /
13# dripping (6.002914) /
12# foaming (6.002915) /
12# spilling_out (6.002916) /
13# squirting (6.002917) /
12# streaming (6.002918).

of_sound ->
3# banging (6.002937) /
1# beating (6.002938) /
2# beeping (6.002939) /
2# bellowing (6.002941) /
2# blaring (6.002942) /
2# booming (6.002943) /
2# burbling (6.002944) /
3# buzzing (6.002945) /
3# chiming (6.002946) /
1# chinking (6.002947) /
1# clacking (6.002948) /
1# clanging (6.002949) /
1# clanking (6.002951) /
2# clicking (6.002952) /
1# clinking (6.002953) /
1# clunking (6.002954) /
3# groaning (6.002955) /
3# growling (6.002956) /
3# gurgling (6.002957) /
3# hissing (6.002958) /
2# hooting (6.002959) /
3# howling (6.002961) /
3# humming (6.002962) /
3# jangling (6.002963) /
2# jingling (6.002964) /
3# moaning (6.002966) /
2# murmuring (6.002967) /
1# pealing (6.002968) /
1# pinging (6.002969) /
3# popping (6.002972) /
3# shrieking (6.002973) /
3# singing (6.002974) /

1# sizzling (6.002975) /
2# spluttering (6.002976) /
1# sputtering (6.002977) /
1# squawking (6.002978) /
3# squeaking (6.002979) /
3# squealing (6.002981) /
1# thudding (6.002982) /
3# ticking (6.002983) /
1# tolling (6.002984) /
1# tooting (6.002985) /
2# trumpeting (6.002986) /
1# twanging (6.002987) /
3# wailing (6.002988) /
3# whining (6.002989) /
1# whirring (6.002991) /
3# whistling (6.002992) /
1# zinging (6.002993).

Appendix B2: The System Network For Two-Role, Agent plus Affected Action Processes

```
/* SYSTEM NETWORK FOR 'AGENT PLUS AFFECTED' PROCESSES */

agent_plus_affected ->
10#     affecting_as_such /
0.5#    not affecting
20#     social_action /
69.5#   material_action.

affecting_as_such ->
70#     affecting (6.004101) /
5#      acting_on (6.004102) /
5#      colouring (6.004103) /
5#      disturbing (6.004104) /
5#      hitting (6.004105) /
5#      influencing (6.004106) /
5#      interferring_with (6.004107).

not_affecting ->
10#     sparing (6.004111) /
90#     leaving_alone (6.004112).

social_action ->
20#     social_action_involving_two_parties /
80#     general_social_action.

social_action_involving_two_parties ->
15#     starting_couple /
70#     within_couple /
15#     ending_couple.

starting_couple ->
60#     asking_out (6.004152) /
30#     proposing_to (6.004153) /
10#     proposing_marriage_to (6.004154).

within_couple ->
0.5#    embracing (6.004161) /
20#     hugging /
20#     cuddling /
30#     kissing /
28.5#   having_sex_with /
0.5#    getting_off_with (6.004162) /
0.5#    going_with (6.004163).

hugging ->
40#     hugging_as_such (6.0041611) /
60#     giving_a_hug (6.0041612).

cuddling ->
30#     cuddling_as_such (6.0041621) /
60#     giving_a_cuddle (6.0041622) /
10#     having_a_cuddle (6.0041623).
```

kissing ->
60# kissing_as_such (6.0041631) /
30# giving_a_kiss (6.0041632) /
3# necking (6.0041633) /
4# snogging (6.0041634) /
3# pecking (6.0041635).

having_sex ->
50# making_love_to (6.0041641) /
30# fucking (6.0041642) /
20# screwing (6.0041643).

ending_couple ->
3# throwing_over (6.004171) /
3# dumping (6.004172) /
25# finishing_with (6.004173) /
25# breaking_up_with (6.004174) /
25# splitting_up_with (6.004175) /
4# running_out_on (6.004176) /
15# leaving (6.004177) /

general_social_action ->
35# visiting /
5# encountering_ag_af /
35# social_action_by_empowered_person /
10# abusing_ag_af /
2# interrupting_event /
5# supporting_ag_af /
0.5# playing_with (6.004201) /
0.5# using (6.004202).
0.5# cursing (6.004203) /
3# blaming (6.004204) /
0.5# guiding (6.004205) /
0.5# taming (6.004206) /
0.5# sticking_up (6.004207) /
0.5# holding_up (6.004208) /
0.5# spoiling (6.004209) /
0.5# giving_away (6.004210) / by father of daughter
0.5# calming (6.004211).

visiting ->
70# visiting_as_such (6.004221) /
5# calling_on (6.004222) /
5# calling_in_on (6.00423) /
5# seeing (6.004224) /
5# meeting_up_with (6.004225) /
5# getting_together_with (6.004226) /
5# looking_up (6.004227).

encountering_ag_af ->
80# encountering /
20# not_encountering.

encountering ->
1# encountering_as_such (6.004231) /
90# meeting (6.004232) /
5# bumping_into (6.004233) /
2# running_across (6.004234) /
2# running_into (6.004235).

not_encountering ->
20# avoiding (6.004236) /
4# passing (6.004237) /
4# passing_over (6.004238) /
60# ignoring (6.004239) /
4# neglecting (6.004240) /
4# standing_up (6.004241) /
4# staying_away_from (6.004242).

social_action_by_empowered_person ->
2# religious_domain /
20# employment_domain /
30# legal_domain /
28# medical_domain /
7# military_domain /
7# leadership_domain /
5# criminal_domain /
0.5# punishing (6.0042011) /
0.5# rewarding (6.0042012).

religious_domain ->
70# blessing (6.0042013) /
10# christening (6.004214) /
5# baptizing (6.004215) /
1# confirming (6.004216) /
13# marrying (6.004217) /
1# crowning (6.004218).

employment_domain ->
60# sacking (6.004220) /
20# letting_go (6.004221) /
10# laying_off (6.004222) /
10# making_redundant (6.004223) /

//**if am_english then M < 'fire', if br_english then M < 'sack'**//

//**processes of employment concerning 'appointment' are attributive processes or locational**//

legal_domain ->
2# policing (6.0042231) /
50# arresting (6.0042232) /
2# pulling_in (6.0042233) /
10# cautioning (6.0042234) /
10# charging (6.0042235) /
1# trying (6.0042236) /
1# fining (6.0042237) /
23# imprisoning /
0.5# framing (6.0042239) /
0.5# shutting_up (6.0042240).

imprisoning ->
25# imprisoning_as_such (6.00422381) /
25# sending_to_prison (6.00422382) /
25# sending_down (6.00422383) /
25# jailing (6.00422384).

medical_domain ->
25# attending (6.0042241) /

25# treating (6.0042242) /
25# curing (6.0042243) /
25# healing (6.0042244).

military_domain ->
25# attacking (6.0042251) /
25# defending (6.0042252) /
6# opening_fire_on (6.0042253) /
1# beseiging (6.0042254) /
20# invading (6.0042255) /
1# occupying (6.0042256) /
6# seizing (6.0042257) /
6# taking (6.0042258) /
5# conquering (6.0042260) /
6# defeating (6.0042261).

leadership_domain ->
10# civilizing (6.0042271) /
10# commanding (6.0042272) /
20# leading (6.0042273) /
10# governing (6.0042274) /
10# taxing (6.0042275) /
10# punishing (6.0042276) /
10# rewarding (6.0042277) /
10# modernizing (6.0042278) /
10# freeing (6.0042279) /

criminal_domain ->
40# stealing (6.0042281) /
30# robbing (6.0042282) /
5# holding_up (6.0042283) /
5# doing_over (6.0042284) /
20# burgling (6.0042285).

abusing_ag_af ->
60# physically_abusing_ag_af /
40# verbally_abusing_ag_af.

physically_abusing_ag_af ->
10# bothering (6.004241) /
5# stalking (6.004242) /
5# molesting_as_such (6.004243) /
10# raping (6.004244) /
10# assaulting (6.004245) /
40# attacking (6.004246) /
15# abusing (6.004247) /
5# setting_on (6.004248).

verbally_abusing_ag_af ->
10# teasing (6.004251) /
4# taking_the_micky_out_of (6.004252) /
10# abusing (6.004253) /
4# scolding (6.004254) /
10# threatening (6.004255) /
11# criticizing (6.004256) /
3# tearing_into (6.004257) /
5# putting_down (6.004258) /
3# talking_down_to (6.004259) /
3# running_down (6.004260) /
5# laying_into (6.004261) /

5# knocking (6.004262) /
3# getting_on_at (6.004263) /
5# getting_at (6.004264) /
5# getting_back_at (6.004265) /
3# doing_down (6.004266) /
3# being_on_at (6.004267) /
5# being_hard_on (6.004268) /
3# being_at (6.004269).

interrupting_event ->
45# interrupting (6.004280) /
45# interrupting_discourse /
10# breaking_off (6.004281).

interrupting_discourse ->
20# breaking_in_on/upon (6.004282) /
20# breaking_into (6.004283) /
20# cutting_in (6.004284) /
20# cutting_off (6.004285) /
20# cutting_short (6.004286).

supporting_ag_af ->
70# physically_supporting_ag_af /
30# verbally_supporting_ag_af.

physically_supporting_ag_af ->
20# supporting_as_such (6.004290) /
10# backing_up (6.004291) /
5# standing_by (6.004292) /
10# standing_up_for (6.004293) /
4.375# sticking_by (6.004294) /
4.375# sticking_to (6.004295) /
4.375# sticking_up_for (6.004296) /
4.375# getting_behind (6.004297) /
4.375# accomodating (6.004298) /
5# looking_after (6.004299) /
4.375# bringing_up (6.0042911) /
5# caring_for (6.0042912) /
4.375# catering_for (6.0042913) /
5# taking_care_of (6.0042914) /
4.375# tending (6.0042915) /
5# nursing (6.0042916).

verbally_supporting_ag_af ->
40# speaking_up_for (6.0042917) /
30# speaking_for (6.0042919) /
30# encouraging (6.0042920).

material_action ->
35# affecting_by_contact /
5# affecting_by_lack_of_contact /
35# change_of_state_ag_af /
10# preparing /
5# ingestion /
2.5# concealment_ag_af /
2.5# change_position_ag_af /
5# using.

affecting_by_contact ->
20# destroying /

20# hitting /
20# killing /
10# hurting /
10# touching /
10# breaking /
2# mending /
8# cutting.

destroying->
6# blowing_up (6.004301) /
6# breaking_down (6.002526) /
4# breaking_up (6.002542) /
10# burning (6.002637) /
6# burning_down (6.004305) /
4# crushing (6.004306) /
10# destroying_as_such (6.004307) /
6# exploding (6.004308) /
4# kicking_down (6.004309) /
4# kicking_in (6.0043010) /
6# knocking_down (6.0043011) /
1# knocking_out (6.0043012) /
4# pulling_down (6.0043013) /
3# bursting (6.002536) /
3# spoiling (6.0043015) /
4# sinking (6.002439) /
4# wrecking (6.0043017) /
7# ruining (6.0043019) /
2# tearing_down (6.0043021) /
0.5# wasting (6.0043022) /
0.5# washing_away (6.0043023) /
5# tearing_apart (6.0043025).

hitting->
9# beating (6.004311) /
10# beating_up (6.004312) /
2# biting (6.004313) /
1# crashing_against (6.004315) /
1# doing_over (6.004316) /
0.2# hammering (6.004317) /
0.2# hammering_down (6.004318) /
0.2# hammering_at (6.004319) /
25# hitting_as_such (6.0043110) /
7# hitting_at (6.0043111) /
7# hitting_out_at (6.0043112) /
7# kicking (6.0043113) /
4# knocking_about (6.0043114) /
4# laying_into (6.0043115) /
4# pushing (6.0043116) /
4# poking (6.0043117) /
4# pinching (6.0043118) /
0.2# running_down (6.0043119) /
0.2# running_over (6.0043120) /
1# running_through (6.0043121) /
4# shaking (6.002865) /
0.2# shelling (6.0043123) /
0.2# shooting_off (6.0043124) /
0.2# shooting_away (6.0043125) /
4# striking (6.0043126) /
1# striking_against (6.0043127) /
0.2# swinging_at (6.0043128) /

0.2# tearing_at (6.0043129) /
1# whipping (6.0043130).

killing->
2# assasinating (6.004321) /
5# choking (6.004322) /
5# drowning (6.004323) /
5# hanging (6.004324) /
37# killing_as_such (6.004325) /
5# knocking_off (6.004326) /
20# murdering (6.004327) /
5# shooting (6.004328) /
5# suffocating (6.004329) /
1# doing_in (6.0043210) /
1# doing_away_with (6.0043211) /
2# bumping_off (6.0043212) /
1# asphyxiating (6.0043213) /
1# burning_to_death (6.0043214) /
1# taking_out (6.0043215) /
2# putting_down (6.0043216) /
2# executing (6.0043217).

hurting->
20# burning (6.002637) /
20# cutting (6.004332) /
5# harming (6.004333) /
20# hurting_as_such (6.004334) /
5# injuring (6.004335) /
0.5# putting_out (6.004336) /
0.5# dislocating (6.004337) /
0.5# skinning (6.004338) /
0.5# blinding (6.004339) /
4# rubbing (6.0043310) /
1.5# scratching (6.0043311) /
0.5# scraping (6.0043312) /
1# stinging (6.0043313) /
20# wounding (6.0043314) /
0.25# twisting (6.0043315) /
0.25# (6.002426) /
0.5# tearing (6.0043317).

touching->
2.5 being_at (6.004341) /
5# tapping (6.004342) /
5# brushing (6.004343) /
2.5# fingering (6.004344) /
30# pressing (6.004345) /
5# rubbing (6.004346) /
50# touching_as_such (6.004347).

breaking->
40# breaking_as_such (6.002541) /
2# bursting (6.004352) /
0.4# chipping (6.002555) /
3# cracking (6.002552) /
3# crashing (6.004355) /
3# crushing (6.002556) /
0.4# fracture (6.002545) /
3# ripping (6.002558) /
3# shattering (6.002539) /

7# smashing (6.002535) /
3# snapping (6.002537) /
0.2# splintering (6.002549) /
7# splitting (6.002548) /
2# splitting_open (6.0043514) /
7# tearing (6.002559) /
3# tearing_up (6.0043516) /
7# collapsing (6.002532) /
7# damaging (6.0043518).

mending ->
30# mending_as_such (6.004361) /
34# fixing (6.004362) /
30# repairing (6.004363) /
2# touching_up (6.004364) /
2# taking_in (6.004365) /
2# screwing_down (6.004366).

//**if casual then M < ‘fix’, if consultative then M < ‘mend’, if formal then M < ‘repair’**//

cutting ->
1# sawing (6.004371) /
85# cutting_as_such (6.004372) /
5# cutting_into (6.004373) /
5# cutting_off (6.004374) /
5# cutting_up (6.004375) /
5# cutting_at (6.004314) /
1# snipping (6.004376) /
1# trimming (6.004377) /
2# carving (6.004378) /
0.1# dicing (6.004379) /
0.8# filing (6.0043710) /
0.1# shredding (6.0043711) /
2# tearing (6.0043712) /
2# shaving (6.0043713).

not_affecting_by_contact ->
100# missing (6.004381).

change_of_state_ag_af ->
40# changing_as_such /
6# evaluative_change_of_state_ag_af /
6# cooking /
2# changing_consistency /
6# changing_quality /
10# changing_size /
2# changing_number /
2# changing_temperature /
2# changing_strength /
2# changing_fullness /
2# changing_appearance /
2# changing_consciousness /
2# changing_dryness /
6# shaping /
10# developing.

change_as_such ->
80# changing (6.002323) /
5# altering (6.002324) /
5# transforming (6.002325) /

5# turning_around (6.004404) /
5# moving (6.002327).

evaluative_change_of_state_ag_af ->
70# change_for_better_ag_af /
30# worsening (6.002827) /

change_for_better_ag_af ->
50# improving (6.002823) /
50# making_better (6.004407).

cooking ->
70# cooking_as_such_ag_af (6.002511) /
0.1# overcooking (6.004411) /
4.9# cooking_in_liquid_ag_af /
17# cooking_in_oven_ag_af /
8# cooking_by_direct heat_ag_af.

cooking_in_liquid_ag_af ->
95# cooking_in_water_ag_af /
2.5# cooking_in_oil_ag_af /
2.5# cooking_in_juices_ag_af.

cooking_in_water_ag_af /
0.5# blanching (6.0044101) /
90# boiling (6.002512) /
0.5# coddling (6.0044103) /
0.5# parboiling (6.0044104) /
3.5# poaching (6.002517) /
5# simmering (6.002516) /

cooking_in_oil_ag_af /
5# deep-frying (6.0044107) /
80# frying (6.002515) /
5# pan-frying (6.0044109) /
5# saute-ing (6.002519) /
5# stir-frying (6.0044111) /

cooking_in_juices_ag_af.
70# stewing (6.002518) /
30# pot-roasting (6.0044113).

cooking_in_oven_ag_af ->
47# baking (6.002522) /
2# braising (6.0044115) /
2# mircrowaving (6.0044116) /
2# oven-frying (6.0044117) /
47# roasting (6.002521) /

cooking_by_direct heat_ag_af ->
2# barbecue-ing (6.002524) /
2# browning (6.0044120) /
1# crisping (6.0044121) /
50# grilling (6.002523) /
20# steaming (6.002628) /
25# toasting (6.002525).

change_consistency ->
20# eating_away_at (6.004420) /

15#	reducing (6.004421) /
15#	firing (6.004422) /
25#	dissolving (6.004423) /
25#	freezing (6.002612).

change_quality ->
15#	change_smoothness_ag_af /
15#	change_hardness_ag_af /
15#	change_tightness_ag_af /
15#	change_flavour_ag_af /
15#	change_sharpness_ag_af /
5#	levelling (6.004425) /
5#	dirtying (6.004426) /
5#	steadying (6.004427) /
5#	standardizing (6.004428) /
5#	steepening (6.002718).

change_smoothness_ag_af ->
70#	making_smooth /
30#	roughening (6.002715).

making_smooth ->
55#	ironing (6.004431) /
15#	smoothing (6.004432) /
15#	levelling (6.004433) /
15#	rolling (6.004434) /

change_hardness_ag_af ->
50#	hardening_as_such (6.002639) /
50#	softening_as_such (6.002646).

change_tightness_ag_af ->
40#	making_slack /
60#	tightening_as_such (6.002723).

making_slack ->
25#	slackening (6.004438) /
75#	loosening (6.004439).

change_flavour_ag_af ->
5#	salting (6.004440) /
45#	sweetening (6.002721) /
5#	browning (6.004442) /
45#	flavouring (6.004443).

change_sharpness_ag_af ->
65#	sharpening_as_such (6.002716) /
35#	blunting (6.004445).

change_size ->
70#	increasing_size_ag_af /
30#	decreasing_size_ag_af.

increasing_size_ag_af ->
2#	enlargening (6.002725) /
15#	extending (6.004447) /
40#	increasing (6.002728) /
1#	inflating (6.0044497) /
2#	putting_up (6.0044410) /
2#	lengthening (6.002734) /

5# lifting (6.0044412) /
1# broadening (6.002731) /
1# fattening (6.002732) /
5# widening (6.002736) /
5# heightening (6.002733) /
5# deepening (6.0044417) /
1# thickening (6.002735) /
15# developing (6.0044419).

decreasing_size_ag_af ->
5# bringing_down (6.004450) /
5# contracting (6.002745) /
10# cutting (6.004452) /
15# cutting_back (6.004453) /
15# cutting_down (6.004454) /
5# decreasing (6.002744) /
15# knocking_down (6.004456) /
15# reducing (6.002752) /
2# lessening (6.002749) /
2# lightening (6.004459) /
2# shortening (6.002751) /
2# compressing (6.002743) /
2# thinning (6.002748) /
2# shrinking (6.0044513).

change_number ->
20# splitting (6.004460) /
20# dividing (6.002766) /
20# breaking _up (6.002542) /
20# dividing_up (6.004463) /
8# doubling (6.002759) /
4# tripling (6.002762) /
4# treble (6.002763) /
4# quadruple (6.002761).

change_temperature ->
50# increasing_temperature /
50# decreasing_temperature.

increasing_temperature ->
25# heating (6.002769) /
25# heating_up (6.002771) /
5# overheating (6.002772) /
10# warming (6.004473) /
25# warming_up (6.002768) /
10# warming_through (6.002767).

decreasing_temperature ->
30# cooling (6.004476) /
35# cooling_down (6.002774) /
35# chilling (6.002775).

change_speed ->
50# increasing_speed /
50# decreasing_speed.

increasing_speed ->
70# speeding_up (6.002778) /
10# quickening (6.002776) /
10# hastening (6.004482) /

10#	hurrying (6.004483).

decreasing_speed ->
70#	slowing_down (6.002782) /
15#	decelerating (6.002783) /
15#	slowing_up (6.002781).

change_strength ->
50#	increasing_strength /
50#	decreasing_strength.

increasing_strength ->
70#	strengthening (6.002785) /
30#	toughening (6.002786).

decreasing_strength ->
30#	dulling (6.004492) /
35#	killing (6.004493) /
35#	weakening (6.002784).

change_fullness ->
50#	increasing_fullness /
50#	decreasing_fullness.

increasing_fullness ->
20#	filling (6.002787) /
20#	filling_in (6.004501) /
20#	filling_out (6.004502) /
40#	filling_up (6.002788) /

decreasing_fullness ->
50#	emptying (6.002792) /
50#	draining (6.002791).

change_appearance ->
10#	blurring (6.002652) /
10#	colouring (6.004511) /
10#	colouring_in (6.004512) /
40#	fading (6.002655) /
10#	inking (6.004514) /
10#	lightening (6.004515) /
10#	shading_in (6.004516).

change_in_consciousness ->
70#	to_conscious /
30#	to_unconscious.

to_conscious ->
5#	awakening (6.004520) /
85#	waking (6.004521) /
5#	bringing_round (6.004527) /
5#	bringing_to (6.004528).

to_unconscious ->
40#	sending_to_sleep (6.004523) /
30#	knocking_out (6.004524) /
30#	laying_out (6.004526) /

change_dryness ->
10#	wetting (6.004530) /

60# drying (6.002626) /
10# drying_up (6.004532) /
10# watering (6.004533) /
5# damping (6.004534)/
5# dampening (6.004535).

shaping ->
3# arching (6.004540) /
3# coiling (6.004541) /
3# curling (6.004542) /
3# curving (6.002423) /
30# bending (6.002421) /
15# shaping (6.004546) /
3# working (6.004547) /
3# creasing (6.004548) /
3# crinkling (6.004549) /
3# folding (6.0045410) /
5# flattening (6.0045411) /
5# forming (6.0045412) /
5# pulling_apart (6.0045413) /
10# straightening (6.002718) /
3# twisting (6.002426) /
3# wrinkling (6.0045416).

developing ->
30# aging (6.002815) /
25# bringing_on (6.004551) /
5# building_up (6.004552) /
30# developing_as_such (6.002811) /
30# growing (6.002727).

preparing ->
30# preparing_as_such /
30# bodily_preparing /
30# domestic_preparing /
10# food_preparing /

preparing_as_such ->
80# preparing (6.004601)
0.5# binding (6.004602) /
0.5# breaking_in (6.004603) /
0.5# composing (6.004604) /
0.5# curing (6.004605) /
8# setting_out (6.004606) /
5# laying_out (6.004607) /
5# putting_out (6.004608).

bodily_preparing ->
2# bathing (6.004610) /
60# washing (6.004611) /
2# dressing (6.004612) /
2# undressing (6.004613) /
2# shaving (6.004614) /
20# showering (6.004615) /
2# bp_body_part_specified.

bp_body_part_specified ->
70# brushing (6.0046101)
25# combing (6.0046102)
5# flossing (6.0046103)

domestic_preparing->
2.5# brushing (6.004620) /
15# cleaning (6.004621) /
5# cleaning_up (6.004622) /
5# clearing (6.002653) /
2.5# clearing_out (6.004624) /
2.5# clearing_up (6.004625) /
2.5# doing_out (6.004626) /
5# dusting (6.004627)
10# hoovering (6.004628) /
2.5# polishing (6.004629) /
2.5# rubbing (6.0046210) /
2.5# shining (6.0046211) /
15# washing (6.0046212) /
2.5# wiping (6.0046213) /
2.5# wiping_out (6.0046214) /
2.5# wiping_up (6.0046215) /
2.5# wiping_down (6.0046216) /
2.5# washing_out (6.0046217) /
5# washing_up (6.0046218) /
2.5# washing_down (6.0046219) /
2.5# washing_away (6.0046220) /
10# sweeping (6.0046221) /
2.5# sweeping_out (6.0046222) /
2.5# sweeping_up (6.0046223).

food_preparing ->
5# skinning (6.004631) /
5# beating (6.004632) /
5# bottling (6.004633) /
5# buttering (6.004634) /
5# dressing (6.004635) /
10# grating (6.004636) /
10# peeling (6.004637) /
10# slicing (6.004638) /
5# smoking (6.004639) /
5# shelling (6.0046310) /
10# whipping (6.0046311) /
10# whisking (6.0046312) /
5# liquidizing (6.0046313) /
5# stuffing (6.0046314) /
5# mincing (6.0046315).

ingesting->
10# generic_ingestion /
50# ingesting_food /
40# ingesting_liquid.

generic_ingestion ->
10# swallowing (6.004641) /
10# ingesting_as_such (6.004642) /
10# digesting (6.004643) /
10# going_through (6.004644) /
10# taking_in (6.004645) /
10# throwing_down (6.004646) /
10# putting_away (6.004647) /
10# bringing_up (6.004648) /
10# holding_down (6.004649) /
10# keeping_down (6.0046410).

ingesting_food ->
93# eating (6.0046411) /
2# chewing (6.0046412) /
1# masticating (6.0046413) /
1# devouring (6.0046414) /
1# feeding_on (6.0046415) /
1# nibbling (6.0046416) /
1# picking_at (6.0046417).

ingesting_liquid ->
84# drinking (6.0046418) /
1# quaffing (6.0046419) /
2# sipping (6.0046420) /
1# sucking (6.0046421) /
2# lapping_up (6.0046422) /
2# washing_down (6.0046423) /
2# throwing_back (6.0046424) /
2# knocking_back (6.0046425) /
2# swigging (6.0046426).

concealment ->
50# concealing /
50# revealing.

concealing->
3# concealing_as_such (6.004651) /
2# barring (6.004652) /
5# blocking (6.004653) /
2# bottling_up (6.004654) /
5# burying (6.004655) /
30# closing (6.002413) /
30# covering (6.004657) /
2# cutting_out (6.004658) /
2# harbouring (6.004659) /
10# hiding (6.0046510) /
2# shading (6.0046511) /
2# screening (6.0046512) /
2# stopping (6.0046513) /
2# veiling (6.0046514).

revealing->
10# blowing (6.004661) /
10# showing (6.004662) /
70# revealing_as_such (6.004663) /
10# baring (6.004664).

change_position_ag_af ->
40# relative_to_opening_in_enclosure /
40# relative_to_upright_state /
10# removal_of_closing_device /
9# with_inherent_direction.
0.5# stirring (6.004672) /
0.5# swinging (6.004673) /

relative_to_opening_in_enclosure ->
60# opening_ag_af /
40# closing.

opening_ag_af ->

95#	opening_as_such (6.002411) /
2.5#	forcing_open (6.0046741) /
2.5#	throwing_open (6.0046742).

closing ->
46#	closing_as_such (6.002413) /
46#	shutting (6.002142) /
2#	drawing (6.0046745) /
2#	shutting_up (6.0046746) /
2#	putting_to (6.0046747) /
2#	pulling_to (6.0046748).

relative_to_upright_state_ag_af ->
80#	knocking_over (6.0046749) /
5#	upsetting (6.0046750) /
5#	felling (6.0046751) /
5#	upending (6.0046752) /
5#	kicking_over (6.0046753).

removal_of_closing_device ->
90#	opening (6.002411) /
2.5#	cracking_open (6.0046754) /
2.5#	twisting_off (6.0046755).
5#	removing (6.0046756) /

with_inherent_direction ->
5#	vehicle_wise /
95#	pursuit_wise /

vehicle_wise ->
backing_up (6.0046757).

pursuit_wise ->
20#	pursuing_as_such (6.0046761) /
3#	getting_after (6.0046762) /
20#	following (6.0046763) /
3#	creeping_up_on (6.0046764) /
3#	being_after (6.0046765) /
20#	going_after (6.0046766) /
3#	tracking (6.0046767) /
7#	running_after (6.0046768) /
7#	coming_after (6.0046769) /
7#	coming_for (6.0046770) /
7#	making_after (6.0046771).

using ->
0.5#	beginning_to_use_ag_af /
90#	using_as_such_ag_af /
9.5#	using_completely_ag_af.

beginning_to_use_ag_af ->
100#	breaking_into (6.004681).

using_as_such_ag_af ->
90#	using_as_such (6.004682)/
2#	drawing_on (6.004683) /
2#	running_down (6.004684) /
2#	running_off (6.004685) /
2#	running_on (6.004686) /
2#	swallowing_up (6.004687).

using_completely_ag_af ->
10#	using_up (6.004688) /
5#	getting_through (6.004689) /
50#	finishing (6.0046810) /
10#	finishing_up (6.0046811) /
10#	finishing_off (6.0046812) /
5#	being_through (6.0046813) /
10#	running_out_of (6.0046814).

Appendix B3: The System Network For Three-Role Directional Processes

/* SYSTEM NETWORK FOR 'RELATIONAL', 'THREE ROLE', 'DIRECTIONAL' PROCESSES */

```
plus_3_p_ag _dir ->
50#     agent_not_accompanying_af_ca /
50#     agent_accompanying_af_ca.

&

2#      return_to_original_location /
98#     no_return_to_original_location.

&

60#     no_subsidiary_direction /
40#     plus_subsidiary_direction.

agent_not_accompanying_af_ca ->
40#     distance_implied /
60#     no_distance_implied.

distance_implied ->
50#     sending_as_such /
5#      electronic_sending /
35#     sending_via_post_office /
10#     sending_by_vehicle.

sending_as_such ->
98#     sending (3.0041101) /
2#      getting_off_to (3.0041102).          Sp rule – no subsidiary direction

electronic_sending ->
60#     emailing (3.0041103) /
39#     faxing (3.0041104) /
1#      beaming (3.0041105).

sending_via_post_office ->
50#     mailing (3.0041106) /
50#     posting (3.0041107).

//**if am_english then M < 'mail',  if br_english then M < 'post'**//

sending_by_vehicle ->
20#     shipping (3.0041108) /
40#     flying_in (3.0041109) /
40#     flying_over (3.0041110).

no_distance_ implied ->
80#     movement_with_force /
20#     movement_without_force.
```

movement_with_force ->
56# propelling_af_ca_using_body_part /
16# propelling_af_ca_using_equipment /
14# shooting (3.0041111) /
14# firing (3.0041112).

propelling_af_ca_using_body_part ->
35# typically_using_arm /
32# typically_using_foot (3.0041114)./
33# using_any_body_part (3.0041115)..

typically_using_arm ->
50# tua_af_ca_controlled_throughout (3.00411131)/
50# tua_af_ca_initially_controlled (3.00411132).

movement_without_force ->
90# agent_has_full_control _of_movement /
10# agent_has_initial_control_of_movement.

agent_has_full_control_of_movement ->
50# unmarked_full_control /
10# substance_specific_full_control /
10# full_control_involving_dispersable_af_ca /
8# full_control_of_af_ca_into_container /
1# full_control_of_af_ca_into_earth (3.0042122) /
1# full_control_using_implement /
20# full_control_with_inherent_direction.

unmarked_full_control ->
40# putting (3.0042101) /
5# placing (3.0042102) /
10# setting (3.0042103) /
40# moving (3.0042104) /
1# sticking (3.0042105) /
2# spreading (3.0042106) /
2# transferring (3.0042107).

substance_specific_twf ->
40# sst_involving_liquid /
30# sst_involving_light /
30# sst_involving_air.

sst_involving_liquid ->
98# pouring (3.0042108) /
0.5# flooding (3.0042109) /
1# squirting (3.0042110) /
0.5# spurting (3.0042111).

sst_involving_light ->
29# beaming (3.0042112) /
70# shining (3.0042113) /
1# glaring (3.0042114).

sst_involving_air ->
70# blowing (3.0042115) /

30#	breathing (3.0042116).

full_control_involving_dispersable _af_ca ->
45#	piling (3.0042117) /
45#	scattering (3.0042118) /
10#	raining (3.0042119).

full_control_of_af_ca_into_container ->
50#	packing (3.0042120) /
50#	packing_up (3.0042121).	Sp rule – no specified direction.

full_control_using_implement ->
40#	pinning (3.0042123) /
20#	nailing (3.0042124) /
40#	sweeping (3.0042125).

full_control_with_inherent_direction ->
25#	full_control_inherently_in_relation_to_upright_position /
25#	full_control_inherently_upwards /
25#	full_control_inherently_downwards /
25#	full_control_inherently_out_of.

full_control_inherently_in_relation_to_upright_position ->
25#	laying (3.0042126) /
25#	leaning (3.0042127) /
25#	sitting (3.0042128) /
25#	seating (3.0042129).

full_control_inherently_upwards ->
35#	lifting (3.0043101) /
30#	raising (3.0043102) /
35#	picking_up (3.0043103).	Sp rule – no subsidiary direction

full_control_inherently_downwards ->
35#	dropping (3.0043104) /
35#	lowering (3.0043105) /
30#	sinking (3.0043106).

full_control_inherently_out_of ->
30#	withdrawing (3.0043107) /
40#	removing (3.0043108) /
30#	sending_down_from (3.0043109).	Sp rule – no subsidiary direction.

agent_has_initial_control_over_movement ->
20#	manner_of_movement _specified /
80#	manner_of_movement _unspecified.

manner_of_movement _specified ->
10#	twisting (3.0043110) /
30#	rolling (3.0043111) /
10#	threading (3.0043112) /
10#	spinning (3.0043113) /
10#	shaking (3.0043114) /
30#	sliding (3.0043115).

manner_of_movement _unspecified ->

40#	passing (3.0043116) /	
20#	casting (3.0043117) /	
40#	turning (3.0043118).	

agent_accompanying_af_ca ->

60#	performer_viewpoint_specified /	
20#	performer_support_specified /	
20#	performer_leadership_specified.	

performer_viewpoint_specified ->

50#	towards_performer_viewpoint (3.0043119)/	
50#	not_towards_performer_viewpoint.	

not_towards_performers_viewpoint ->

90#	unimpeded_movement /	
10#	impeded_movement.	

unimpeded_movement ->

80#	taking (3.0043120) /	
5#	delivering (3.0043121) /	sp rule – no subsidiary direction
5#	tearing (3.0043122) /	Sp rule – prefers source
5#	extracting (3.0043123) /	sp rule – prefers source
10#	removing (3.0043124) /	sp rule – prefers source
5#	fishing_out (3.0043125).	Sp rule – no subsidiary direction.

impeded_movement ->

60#	getting (3.0043126) /	
40#	picking_out_of (3.0043127).	Sp rule – no subsidiary direction

performer_support_specified ->

60#	non_impeded_support (3.0043128) /	
40#	impeded_support.	

impeded_support ->

30#	dragging (3.0043129) /	
70#	pulling (3.0043130) /	

performer_leadership_specified ->

80#	performer_initiated_pls /	
20#	unmarked_pls.	

performer_initiated_pls ->

1#	marching (3.0044101) /	
10#	running (3.0044102) /	
1#	rushing (3.0044103) /	
1#	steering (3.0044104) /	
8#	walking (3.0044105) /	
0.6#	flying (3.0044106) /	sp rule – don't prefer 'in' in subsidiary direction
10#	driving (3.0044107) /	
1#	riding (3.0044108) /	
25#	seeing (3.0044109) /	
25#	showing (3.0044110) /	
0.2#	galloping (3.0044111) /	
0.2#	trotting (3.0044112) /	
8#	backing_up (3.0044113) /	
8#	reversing (3.0044114) /	

1#	sailing (3.0044115).

not_performer_initiated_pls ->
7#	heading (3.0044116) /
40#	leading (3.0044117) /
40#	guiding (3.0044118) /
6#	drawing (3.0044119) /
7#	hurrying (3.0044120).

Appendix B3: The system network for three-role, directional Processes

Appendix C: The Re-Expression Tests for Participant Roles

This appendix consists of material taken from the current draft for Chapter 2 of Fawcett (forthcoming).

"**T1 for Agent (Ag)**

> **If X is the possible Agent, the clause can be re-expressed as**
> **'What X did was to .....'**

Example: 'Ike washed the dog' to 'What Ike did was to wash the dog'.
'The sun melted the snow' to What the sun did was to melt the snow.'

Thus an Agent is typically animate and usually human - but not necessarily, because a wide range of objects have 'creature-like' qualities - from robots and computers to the sun and even a pillar, as in *That pillar holds up / supports the floor above*.

This test identifies 99.9% of Agents. However, in an infrequent type of three-role Process of 'cognition' (or 'communication'), the Agent may be preceded by *from* - and in such cases it requires a modified version of the 'Agent Test', as follows:

T1a for Agent (Ag) preceded by *from* (only in 3-role 'cognition' Processes)

> **If X is the possible Agent and Y is the possible Affected-Cognizant,**
> **the clause can be re-expressed as**
> **'What X did was to cause Y to .....'**

Example: 'Ivy found out the answer from Fred' to 'What Fred did was to cause Ivy to find out the answer'. (See Example 3 in the worked examples at the end of this section.)

T2 for Affected (Af)

If X is the possible Affected, the clause can be re-expressed as
'What happened to X was that .....'
PLUS failure in the Agent test.
Occasionally the test has to be 'What was happening to X was ...'

Examples:

'Ike washed the dog' to 'What happened to the dog was that Ike washed it'.[109]
'The snow melted' to 'What happened to the snow was that it melted'.
'What was happening to the bacon was that it was sizzling.'

T3 for Created (Cre)

If X is the possible Created, the clause can be re-expressed as
'What came into being was X'
OR, in cases of 'preventing', etc,
'**What didn't come into being was X.'**

The Created is typically used in the type of two-role 'action' Process which leads to 'bringing objects into being', i.e. the 'creation' of an **object**. Examples are 'painting a picture (but not a wall)', 'writing a letter / book' or 'building a palace' , as in the first example below.

But it is also used, by extension, for 'influential' Processes in which an Agent brings into being an **event** - and events, as we have seen, may be expressed either in a full clause or in a nominalization, as in the examples given below under 'influential' Processes. If the event is not already a nominalization, it may help the re-expressed

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[109]Alternatively, if you prefer, it could be re-expressed as 'What happened to the dog was that it was washed by Ike'.

version to sound more natural if you first nominalize the embedded clause, e.g. by turning *me to go* in *He allowed me to go* into *my going.* However, it has to be admitted that even when this is done these re-expressions still sound rather less completely natural. (We will come in a moment to the reason for deciding, on balance, to treat this role as a Created rather than a Range.)

Less frequently, the Created is found in a one-role process, as in a *fight erupted* and a *fire started.* It is because the PR is clearly the same in *The race started* and *He started the race* that the decision came down on the side of treating both *He started the race* and *He started running* in the same manner. See the second 'action Process example below.[110]

Examples:

'action' Process:

'John painted a picture' to 'What came into being was a picture'.

'A fire / the race started' to 'What came into being was a fire / the race'.

'influential' processes:

'He made Ivy cry' to 'What came into being was Ivy's crying'.

'He started (me) swimming' to 'what came into being was (me) swimming'.

'He started the race' to 'What came into being was the race'.

'He allowed me to go' to 'What came into being was my going'.

'He stopped me from crying' to 'What didn't come into being was my crying'.

T4 for Range (Ra)

The Range is the PR for which it is hardest to provide a positive test. Its main use is in two-role 'action' clauses, where it typically occurs with an Agent, and where the entity being tested is not an Affected or a Created. In other words, while (in an

[110]It might seem that an alternative test for the Created could be 'What was brought into being was X', rather than 'What came into being was X'. This works well for the two role Processes, but since we want one test that covers both two-role and one-role Processes 'What came into being was X' is preferable.

'action' Process) it is typically an **object**, it is one that is neither affected by the Process nor brought into being by it. Moreover, it is typically a **non-sentient** object (which includes, of course, sentient referents when referred to as if they were non-sentient objects).

The Range is to be distinguished from two other elements. The first is the Circumstance of **Distance** (for which see Section XXX of Chapter 3). This role occurs both with and without the preposition *for*, and it is when it occurs without *for* that some analysts may, under the influence of the patterns of English at the level of form, be tempted to analyze it as a PR, e.g. in *He walked <u>two miles</u>* . The second element from which the Range must be distinguished is the type of 'reified' Process that occurs as a **Process Extension** in examples such as *Ike took a shower*.[111] (See Section 1.5 for a discussion of this element.)

The Range is also used for **embedded events**, typically when they occur in 'influential' and 'event-relating' Processes. In all such cases the Range is filled either by a **clause** or by the **nominalization** of an event, and it typically occurs as the second PR (as it also does in 'action' Processes). In an 'influential' Process it occurs with an Agent or Affected, whereas in an 'event-relating' Process it occurs with a Carrier. Surprisingly, perhaps, the test for a Range in a two-role Process is met reasonably well in these cases too.

Finally, the type of Range that expresses an event also occurs occasionally in a small number of one-role Process types, all of which are related to two-role 'influential' Processes where the embedded event is a Range. (This is a parallel situation, then, to that with the Created.)

Unusually, we need to provide three versions of this test. The first two are for two-role Processes, and the third is for one-role Processes.

If X is the possible Range and Y is the other possible PR,

---

[111]Halliday (1994:146-9) does not make this distinction, which I see as an important one. He treats both cases as Ranges. The need for the distinction become clear when one adds a cognitive dimension to one's model of language and its use, so that one has to decide whether or not a given nominal group in a text has a referent (and so represents an 'object' in the belief system). See the discussion in Section 1.5.

the clause can be re-expressed as

'What Y (Main Verb) was X'
PLUS failure in the other relevant tests (Affected, Created, Matchee etc.).

OR, for a complex example, re-express it as:
'What was it that Y (Main Verb)? It was X'.[112]

OR, for a one-role Process:
Failure in the Affected and Created tests.

Please also note that in the re-expression test for 'influential' Processes below we sometimes need to add a form of the 'pro-verb' *do* (as underlined in the examples)

Examples of Ranges in two-role 'action' Processes:

'Ike sang a song / Annie Laurie' to 'What Ike sang was a song / Annie Laurie'.

'Ivy climbed a mountain / the Matterhorn' to 'What Ivy climbed was a mountain / the Matterhorn' (PLUS failure in the other tests).

Examples of Ranges in two-role 'influential' Processes (with the added *do*-forms underlined):

'He tried to eat it' to 'What he tried <u>to do</u> was to eat it'.

'He kept eating it' to ' What he kept <u>doing</u> was eating it'.

'He stopped reading it' to 'What he stopped <u>doing</u> was reading it'.

---

[112]Another test that may at first seem tempting is the passivisation test, e.g. re-expressing *Whymper climbed the Matterhorn* as *The Matterhorn was climbed by Whymper.* (PLUS failure in the Affected and Created tests). But when the Range is the type that occurs in an 'influential' or 'event-relating' Process this test can lead to misleading results, when used by an inexperienced analyst. This is because, while it is possible to 'passivize' many such examples, e.g. by re-expressing *Ivy stopped me reading it* as *My reading it was stopped by Ivy*, the more natural 'passive' equivalent of this example is *I was stopped reading it by Ivy* - a construction which involves the 'raising' of a element of the embedded clause to function as an element of the matrix clause (for which see Chapter 22 of Fawcett 2001). A second problem is that there are no passive equivalents of some 'event-relating' Processes.

'He stopped me reading it' to 'What he stopped me (from) doing was reading it'.

'He succeeded in hitting it' to 'What he succeeded in doing was hitting it'.

'He failed to hit it' to 'What he failed to do was to hit it'.

'It went on bending' to 'What it went on doing was bending'.

Examples of Ranges in two-role 'event-relating' Processes (with the Range underlined):

'Fred's failing his exams led to his departure from the school' to

'What was it that Fred's failing his exams led to?

'It was his departure from the school'.

'The fact that a mushroom isn't a plant follows from the fact that a fungus isn't a plant' to

'What is it that the fact that a mushroom isn't a plant follows from? It is the fact that a fungus isn't a plant'.

'His application to join the navy followed this (event)' to

'What was it that his application to join the navy followed? It was this (event).'

In this last set of examples it has been necessary to use the alternative test. Using the first test would have resulted in some very clumsy sentences. They are quite complex before we apply any tests, with two embedded events, and the standard test makes them even more complex - but they are not impossible.

Examples of Ranges in one-role Processes:

In 'The match ended', the Process of 'failing' is not only an 'affected-only' 'action' Process. But 'failing is also' a two-role 'influential' Process, and this supports the analysis of *the match* as a Range. Furthermore, *the match* performs unsatisfactorily in the Affected and Created tests.

Similarly, the Process in 'Their attempt to climb Everest failed' is both an 'affected only' 'action' Process and an 'influential' Process, which suggests that here *their attempt to climb Everest* is a Range.

Similar analyses apply to *She ended / began the race / the fight / her journey.*

T5 for Manner [Ma] very infrequent as a PR)

If X is the possible Manner and Y is the possible Agent,
the clause can be re-expressed as
'X is how Y behaved'

Example: 'Ivy treated Fred kindly' to 'Kindly is how Ivy behaved'.

NOTE: This role is only needed as a PR for a small number of two-role Processes such as *behave* and *act*, and the three role Process *treat.*

T6 for Carrier (Ca)

This test must be carried out before any of T7-T11, because the latter all assume that the Carrier has been identified. The Carrier occurs both as a simple PR and as an Agent-Carrier (Ag-Ca) or and Affected Carrier (Af-Ca) See Section 6 below for compound roles.

If X is the possible Carrier, the clause can be re-expressed as
'The thing about X is that ....'
(adding, if it's an Agent-Carrier or Affected-Carrier, 'as a result')
PLUS, if it's a simple Carrier, failure in the Agent and Affected tests.

If the Carrier contains an embedded clause, as in the last two examples below, you should re-express it in its nominalized form (with ing), so that you get a more natural-sounding output.

See the last two examples below for this re-expression test.

Examples:

'Ivy was happy' to 'The thing about Ivy was that she was happy'.

'Ivy was the boss' to 'The thing about Ivy was that she was the boss'.

'Ivy was in Rome' to 'The thing about Ivy was that she was in Rome'.

'Ivy went to Rome' to 'The thing about Ivy was that she went to in Rome' (where *Ivy* is an Agent as well as a Carrier).

'Ivy had fair hair' to 'The thing about Ivy was that she had fair hair'.

'The sun was shining' to 'The thing about the sun was that it was shining'.

'For Ike to hit Fred was bad' to

'The thing about Ike's hitting Fred was that it was bad'.

T7 for Attribute (At)

If X is the possible Attribute and Y is the possible Carrier,
the clause can be re-expressed as
'X is what (or how or who) Y) was',
PLUS if necessary '... as a result'.

Examples:

'Ivy was happy' to 'Happy is what / how Ivy was'.

'Ivy was a year tutor' to 'A year tutor is what Ivy was'.

'Ivy became / got rich' to 'Rich is what / how Ivy was as a result.'

'Ivy became a year tutor' to 'A year tutor is what Ivy was as a result.'

'Ivy became the boss' to 'The boss is what Ivy was as a result'.

'Ike / the decision made Ivy happy' to

'Happy is what / how Ivy was as a result.'

'They elected Ivy (as) the boss' to 'The boss is what Ivy was as a result'.

'Two and two make four' to 'Four is what two and two are'.
'Ivy weighed / was 60 kilos' to '60 kilos is what Ivy was'.
'Yesterday was like my birthday' to
'Like my birthday is what / how yesterday was'.
'Ike was in a temper / heaven' to 'In a temper / heaven is how Ike was'.

Interestingly, the above clause fails the Location test (T8); i.e. we do not say *'In a temper / heaven is where Ike was'.

T8 for Location (Loc)

If X is the possible Location and Y is the possible Carrier,
the clause can be re-expressed as
'X is where (or when) Y was.'

Examples:
'Ivy lived in Cardiff in 1992' to '(In) Cardiff is where Ivy was in 1992'.
'Their wedding was in 1935' to '(In) 1935 was when their wedding was'.
'Ike was with Ivy' to 'With Ivy was where Ike was'.

T9 for Destination (Des)

If X is the possible Destination and Y is the possible Carrier,
the clause can be re-expressed as
'Y went to / towards X',
PLUS no PR passes the test for Possessed (T12).

Examples:
'Ivy went to Peru / IBM' to 'Ivy went to Peru / IBM'.
'Fred put it on the desk' to 'It went to the desk'.
'He threw the stone at the wall' to 'the stone went towards the wall'.

This role (Destination) and the next (Source) are NOT used in any of the Processes of (a) 'X giving Y Z' (or 'X giving Z to Y'), (b) 'X taking Z from Y', (c) X getting Y' or (d) 'X losing Y', which are all types of 'possession' Process. Recognizing this enables a wider range of generalizations to be captured in a more economical manner than is done in some other approaches.

T10 for Source (So)

If X is the possible Source and Y is the possible Carrier,
the clause can be re-expressed as
'Y went away from X',
PLUS no PR passes the test for Possessed (T12).

See also the NOTE immediately above in T9.

Examples:

'Ivy left Peru/IBM' to 'Ivy went away from Peru/IBM'.
'Fred took it off the desk' to 'it went away from the desk'.
'He threw the out of the yard' to 'the stone went away from the yard'.

T11 for Path (Pa)

If X is the possible Path and Y is the possible Carrier,
the clause can be re-expressed as
'Y (the Carrier) went via X.'

Examples:

'Ivy drove past / passed the cottage' to 'Ivy went via the cottage'.
'Ivy went across / crossed the field' to 'Ivy went via the field'.
'Fred pushed it through the hole' to 'it went via the hole'.

T12 for Possessed (Pos)

If X is the possible Possessed and Y is the possible Carrier,
the clause can be re-expressed as
'X was what Y (the Carrier) had/lacked'*,
PLUS if necessary '... as a result'.

*** or ' had on', for *wear, put on, take off,* etc**

Examples:

'Ivy had a car / problem' to	'A car/ problem was what Ivy had'.
'The car needs a new tyre' to	'A new tyre was what the car lacked'.
'Ivy got/ caught a cold' to	'A cold was what Ivy had as a result'.
'Ike gave Ivy a car / a cold' to'	A car / a cold was what Ivy had (as a result).
'Ivy lost the key' to	'The key was what Ivy lacked (as a result)'.

T13 for Emoter (Em)

If X is the possible Emoter and Y is the possible Phenomenon, the clause can be re-expressed as
'X had a good / bad feeling about / need for Y'
PLUS if necessary
(1) adding before Y 'the idea of' and
(2) turning any clause in Y into an ing clause)

Examples:

'Ike liked Ivy' to
'Ike had a good feeling about Ivy'.
'Ivy loathed caviar' to
'Ivy had a bad feeling about caviar'.

'Ike liked to swim in the sea' to
'Ike had a good feeling about swimming in the sea'.
'Ike hoped Ivy would come' to
'Ike had a good feeling about the idea of Ivy coming'.
'The noise of the jets annoyed Ivy' to
'Ivy had a bad feeling about the noise of the jets'.
'Ivy wants some caviar' to
'Ivy has a good feeling about some caviar'.
'Ivy requires a key' to
'A key is what Ivy / the car needs'.

T14 for Perceiver (Perc)

If X is the possible Perceiver and Y is the possible Phenomenon, the clause can be re-expressed as
'X physically perceived Y', PLUS if necessary '... as a result'

The term 'physically' is needed, because many verbs (such as *see* and *perceive* itself) are also used in 'cognition' Processes. The expression 'as a result' is needed when the verb is *show, display*, etc.

Examples:
'Ike saw the dog' to
'Ike physically perceived the dog'.
'Ike saw it gnawing the bone' to
'Ike physically perceived it gnawing the bone'.
'Ike showed Ivy his tonsils' to '
'Ivy physically perceived his tonsils (as a result)'.

T15 for Cognizant (Cog)

If X is the possible Cognizant and Y is the possible Phenomenon, the clause can be re-expressed as
'X knew / thought / didn't know Y,
PLUS if necessary '
(1) adding after Y as a result',
(2) turning any clause in Y into a *that* ... clause.

Examples:

'Ike knew / remembered / forgot (about) Fred' to
'Ike knew Fred'.
'Ivy realised that it was late' to
'Ivy knew that it was late (as a result)'.
'Ike forgot the answer' to
'Ike didn't know the answer'.
'Ike told Ivy the answer' to
'Ivy knew the answer as a result.
'Ivy told / said to Ike to buy it' to
'Ike knew to buy it as a result'.
'Ike remembered eating it' to
He knew that he had eaten it (as a result)'.
'Ike forgot to buy the bread' to
Ike didn't know to buy the bread (as a result)'.
'Ike thought / imagined / believed that Ivy was there' to
'Ike thought that Ivy was there'.
'It seemed / appeared to Ike that Ivy was there' to
'Ike thought that Ivy was there'.

T16 for Phenomenon (Ph)

While most PRs are typically filled by a 'thing', the Phenomenon is typically filled by an 'event'. It is therefore typically filled by a clause, though it may also be filled by an event that is realized as a nominal group – i.e. a **nominalization**.

Note that, as the wording of the tests given below shows, it is necessary to apply the tests for the Emoter, Perceiver or Cognizant **before** the test for the Phenomenon. The tests for the Phenomenon have to be worded slightly differently for each of the three main 'mental' Process types it occurs in.

If X is the possible Phenomenon,
the clause can be re-expressed as follows:
if Y is the Emoter, 'Y had a good / bad feeling about X',
PLUS if necessary '... as a result';
if Y is the Perceiver, 'Y physically perceived X',
PLUS if necessary '... as a result';
if Y is the Cognizant: 'Y knew / thought / didn't know' X,
PLUS if necessary '... as a result' OR
'as a precondition for asking)';[113]
PLUS in all cases failure in the Affected and Created tests.

The unusual wording 'as a precondition for asking' is needed ONLY when the clause reports a question. (An example in the 'three-role cognition' Processes below illustrates this point.)

Examples:

emotion Processes:

'Ike enjoyed his lunch' to 'Ike had a good feeling about his lunch'.

'Ike wanted to visit Rome' to 'Ike had a good feeling about visiting Rome'.

'The noise annoyed Ivy' to 'Ivy had a bad feeling about the noise'.

perception Processes:

'Ike saw the dog' to 'Ike physically perceived the dog'.

[113]The last part of the test is to enable it to identify the type of Phenomenon that occurs when the claue reports an 'information seeker' or a 'proposal for action'.

‘Ike listened to it gnawing the bone’ to ‘Ike physically perceived it gnawing the bone’.

three-role perception Processes:

‘Ivy showed Ike the dog’ to ‘Ike saw the dog as a result’.

cognition Processes:

‘Ike discovered that he was late’ to ‘Ike knew that he was late (as a result)’.

‘Ike planned to visit Rome’ to ‘Ike thought to visit Rome’.

three-role cognition Processes (i.e. ‘communication Processes’)

‘Ike said to Ivy that he would be late’ to

‘Ivy thought he would be late as a result’.

‘Ivy asked Ike to be back by seven’ to ‘Ike knew to be back by seven’.

‘Ike promised Ivy not to be late’ to ‘Ivy knew / thought he would not be late as a result’.

‘Ike asked Ivy whether Fred was there’ to ‘Ivy knew whether Fred was there (as a precondition for asking).’[114]

In DIRECT reported speech the pronouns may need adjusting, e.g.:

‘Ike told Ivy "Fred’ll be there"‘ so’ Ivy knew / thought "Fred’ll be there" as a result’.

‘Ike told Ivy "I’ll be there"‘ so ‘Ivy knew / thought "Ike’ll be there" as a result’.

[114]Strictly speaking, the test for questions used in this example would be more accurate if we added at the beginning ‘Z thought ...’ (where Z is the referent of the possible Agent in the original clause), e.g. like this: ‘Ike thought Ivy knew whether Fred was there (as a pre-condition for asking)’. In other words, it is a precondition of asking an ‘information seeking’ question (though not a ‘test’ question) that the performer thinks that the Addressee may know the answer.

T17 for Matchee (Mtch)

A 'Matchee' is a broad term that is used in Processes of 'matching' and 'comparing', and, by extension, for combining' and 'joining' or 'separating'. A Matchee is therefore prototypically either (a) an object or person that is (or becomes) 'matched' or 'compared' with another related but distinct entity, through the Process expressed in the clause, or (b) by a natural extension of the concept of 'matching', it is something or someone that combines (or is combined) to become (or cease to be) one entity[115].

The role of Matchee occurs across five types of Process: in each of the four types that occur for all 'relational' Processes, and in a very small number of 'emotion' and 'cognition' Processes (as in the last three examples below).

Note that the test can only be applied only AFTER THE IDENTIFICATION OF THE CARRIER (in a 'matching' Process) OR THE PHENOMENON (in an 'emotion' or 'cognition' Process).

If X is the possible Matchee and Y is the possible Carrier or Phenomenon,
the clause can be re-expressed as
'It was X that Y matched (or didn't match)';
OR 'It was X that Y was matched with (or was not matched with);
PLUS if necessary '... as a result';
OR 'It was X that Y became joined with (or unjoined from).

Examples:

'Her shirt goes with her jeans' to

[115] At first, then, it may seem that two different roles are involved, which we might call a 'Matchee' and a 'Combinee'. It makes little difference to the overall model whether we set up two different PRs with more closely defined criteria, or one PR with a broader set of criteria. The reason why it is possible to handle the two together is that the two broad Process types of 'matching' and 'joining' often occur together. In other words, while a process of 'matching' does not necessarily lead on to a process of 'joining', a process of 'joining' is typically preceded a 'matching' process. Here we have decided to avoid adding another PR to the list of seventeen simple PRs by using the term 'Matchee' for the two types, in part because of the relative infrequency of both.

'It was her jeans that her shirt matched'.

'The bill differs from my estimate' to

'It was my estimate that the bill didn't match.'

'The two parts fitted (each other)' to

'It was each other that the two parts matched'.

'Enid married Arnold' to

'It was Arnold that Enid became joined with'.

'ICL merged with Fujitsu' to

'It was Fujitsu that ICL became joined with.

'The vicar introduced Enid to Arnold' to

'It was Arnold that Enid became joined with'.

'I preferred Ike's to Fred's to

'It was Fred's that Ike's was matched with'.

'He compared the book with the film' to

'It was the film that the book was matched with'.

'She matched it against the carpet' to

'It was the carpet that it was matched with'.

NOTE: In the last example, the Process is a 'mental' Process of 'cognition' (and not an 'action' Process, as one might at first think).

5 Compound Participant Roles

As we saw at many points in Section 3, compound PRs occur in many type of Process. There are TEN compound PRs in all, of which ONLY FIVE occur frequently. Each compound PR is made up of two PRs that we have met already - so that we luckily do not need to add any new **re-expression tests** to those in Section 4. So the tests for the compound PRs are made up - as they logically should be - of the tests for each of the two compounded roles. The only point to watch out for is that these tests sometimes need to be applied in the right order, if they are to work effectively - but this is unlikely to cause problems, as the order is typically that of 'left to right'. The worked examples in Section 6 are designed to illustrate this.

Compound PRs always consist of (1) an Agent or Affected plus (2) another role. As we saw throughout Section 3, the relationship between the two 'compounded; PRs is shown by a hyphen (-), as in 'Ag-Perc'. (It is the PR - whether simple or compound - that is then conflated with the element of Subject, Complement or completive, this relationship of 'conflation' being shown by a forward slash (/), as in 'S/Ag-Perc'.

The simple PRs that combine frequently with the **Agent** are the **Carrier** or **Perceiver** (and, less frequently, the Cognizant, for *study,* etc.). Those that combine frequently with the **Affected** are the **Carrier**, the **Possessed** and the **Cognizant** (and, less frequently, the Perceiver, for *show* only, and also the Destination and Source).

Thus the roles to learn to recognize are as follows:

In Relational Processes:

Frequent compound PRs:

Agent-Carrier [Ag-Ca] especially for Processes such as 'going' and 'buying'
Affected-Carrier [Af-Ca] especially for Processes such as 'becoming'
Affected-Possessed [Af-Pos] especially for Processes such as 'giving'

Very infrequent compound PRs:

Affected-Destination [Af-Des] (For examples see Section 3.4.3.)
Affected-Path [Af-Pa]
Affected-Source [Af-So].

In Mental Processes:

Frequent compound PRs:

Agent-Perceiver [Ag-Perc] especially for 'looking at', 'listening to', etc.

Affected-Cognizant [Af-Cog] especially for

(1) Processes of 'learning', and (2) all 'communication' Processes, e.g.'telling' and 'asking' (in both senses of both).

Less frequent compound PRs:

Agent-Cognizant [Ag-Cog] (for *study*, etc).

Affected-Perceiver [Af-Perc] (for *show, demonstrate,* etc).

Affected-Emoter [Af-Em] (for *fall in love with*, etc).

6 Some worked examples

We will work through the analysis of four examples involving compound PRs. The first two are 'relational' Processes (with two and three PRs respectively) and the third is a 'mental' Process with three PRs. The fourth is an example of how to tackle a problem case where the tests do NOT provide a clear answer.

Example 1: 'Ivy remained in Rome'

First we need to form a hypothesis as to which configuration of PRs in Section 3 this clause matches it. With an expression such as 'in Rome', the first question must be: 'Is it a PR or a CR (a Circumstantial Role, realized by a Place Adjunct)?' If it is a PR it must be inherent in the Process of 'remaining', so we need to ask ourselves 'When someone 'remains', do we expect to be told where they are remaining?' The answer is that we do, so we will hypothesize that 'in Rome' is a PR - and, fairly self-evidently, a Location. In other words, 'someone remaining somewhere' is equivalent to 'someone being somewhere'. The first test that we apply, then, should be to confirm our hypothesis that this is indeed a 'locational' Process.

(Recall that, in all types of 'relational' Processes, the Carrier must be tested first, i.e. before the Attribute, Location, Possessed or Matchee.)

Stage 1: T5 for Carrier

'Ivy remained in Rome' to 'The thing about Ivy was that she remained in Rome'.
(TEST PASSED.)

But note the condition on T6: 'PLUS, for a SIMPLE Carrier (i.e. not a COMPOUND Carrier), failure in the Agent AND Affected tests'. We must therefore test next to see whether 'Ivy' is also an Agent or an Affected.

Stage 2: T1 for Agent

'Ivy remained in Rome' to 'What Ivy did was to remain in Rome'.
(TEST PASSED.)

NOTE: Interestingly, then, the test shows that 'remaining somewhere' counts as an act of 'doing', even though it consists of NOT moving. This suggests that the concepts of 'planning' and 'deciding', and so taking responsibility' are more central to the concept of an Agent than 'physical movement'. Note too that, if the Carrier had been *the parcel* instead of *Ivy*, it would not have passed the test for Agent. On the other hand, it would have passed the test for the Affected ('What happened to the parcel was that it remained in Rome'), so that it would be an Affected-Carrier, not a simple Carrier.

Stage 3: T6 for Location

'Ivy remained in Rome' to 'In Rome is where Ivy was'. (TEST PASSED.)

Thus the PRs are an Agent-Carrier and a Location. The Process is therefore the 'locational' type of 'relational' Process.

Example 2: 'Ike lent Ivy the key'.

'Lending' is a kind of temporary 'giving', and 'giving someone something' is 'causing someone to have something'. On some such basis as this we are likely to hypothesize that the clause expresses a 'possessive' Process, i.e. that it contains a Carrier and a Possessed. Since it has three roles, and since all three-role 'relational' Processes have a Agent as the first PR when the sequence is unmarked, we start on the left with *Ike*, testing to see if *Ike* is an Agent. (Notice that working from left to right coincides with the requirement that the Carrier should be tested before the Attribute, Location, Possessed or Matchee.)

Stage 1: T1 for Agent

'Ike lent Ivy the key' to 'What Ike did was to lend Ivy the key'.

(TEST PASSED.)

Stage 2: T2 for Affected

'Ike lent Ivy the key' to 'What happened to Ivy was that Ike lent her the key'.

Stage 3: T6 for Carrier

'Ike lent Ivy the key' to 'The thing about Ivy is that she had the key (as a result)'.

Stage 4: T12 for Possessed:

'Ike lent Ivy the key' to 'The key is what Ivy had (as a result)'.

(TEST PASSED.)

So far, then, we have established that the clause has an Agent, an Affected-Carrier and a Possessed. However, in the case of 'possession' Processes we must also test to see if the Possessed is an Affected as well. If it is a physical object, as it is in this case, we would expect it to pass the test.

Stage 5: T2 for Affected

'Ike lent Ivy the key' to 'What happened to the key was that Ike lent it to Ivy'.

Thus we have shown that the analysis is Ag + Pro + Af-Ca + Af-Pos.

How would we analyze the following related clauses: ‘Ivy lent the key to Ike’, ‘Ivy was lent the key by Ike’, and ‘Lend the key to Ivy’? Even though the sequence of the PRs is different, exactly the same set of tests apply. Remember the guidelines for preparing a clause for testing. You may wish to try out the test on these examples, to check that they work. But be sure to apply the Carrier test before the Possessed test.

You might also like to analyze ‘Ike picked up the book’. This is a Process of ‘someone causing themselves to have something’, i.e. Ag-Ca + Pro + Af-Pos.

Example 3: ‘Fred told Fiona he loved her’

A Process of ‘someone telling someone something’ is equivalent to ‘someone causing someone to know something’. On this basis we hypothesize that this is a ‘cognition’ Process whose first PR is an Agent. Again, we will work from left to right. We need to do this in any case for the last two PRs, because there is the usual restriction on the sequence in which we apply the tests that occur in all ‘mental’ Processes: i.e. the Emoter, Perceiver or Cognizant should be tested before the Phenomenon.

Stage 1: T1 for Agent

‘Fred told Fiona he loved Fiona’ to ‘What Fred did was to tell Fiona he loved her’. (TEST PASSED.)

Stage 2: T2 for Affected

‘Fred told Fiona he loved her’ to ‘What happened to Fiona was that Fred told her he loved her’. (TEST PASSED.)

NOTE: Thus ‘being told something’ counts as ‘something happening to one’.

Stage 3: T15 for Cognizant

‘Fred told Fiona he loved her’ to ‘Fiona knew / thought that he loved her as a result’. (TEST PASSED.)

NOTE: Optimists in matters of human relations will accept *knew* in this test; but pessimists may not, and may even feel that *thought* is too positive. (All such tests are a matter of experience and/or faith and/or taste.)

Stage 4: T16 for Phenomenon

‘Fred told Fiona he loved her’ to ‘Fiona knew he loved her’ (as a result)’. (TEST PASSED.)

NOTE: If the clause was ‘Fred asked Fiona whether Ike loved Ivy’, the test for the Phenomenon would be to re-express it as ‘Fiona knew whether Ike loved Ivy’ (as a precondition for asking)’ - i.e a precondition of Fred’s asking the question was that he thought that Fiona knew whether Ike loved Ivy. If the clause was ‘Ivy told Ike to go’, the re-expression would simply be ‘Ike knew to go (as a result)’.

Example 4: ‘Ike heard from Ivy that you were coming’

The problem is that this is NOT the usual sense of *hear* - where the PRs would be a Perceiver and a Phenomenon. Here there are three PRs. (If you think *from Ivy* is NOT a PR, you are faced with the problem of identifying what type of Adjunct it is. And there is none in Chapter 3 that fits.)

When faced with a difficult case, such as this, the best strategy is (1) to think paradigmatically, and then (2) to try to match the PRs to a well-established set of PRs. So we ask: " What other lexical verbs can occur in a similar structure?" The answer is that quite a few can, e.g. *discover, learn, realize*, etc. (These can all also occur as simply an Affected-Cognizant + Process + Phenomenon.) It seems clear that a Process of ‘someone hearing something from someone’ has the same PRs as ‘someone telling someone something’ - and so it is equivalent to ‘someone causing someone to know something', as in the last example. On this basis we hypothesize that this is a 'cognition' Process whose PRs are an Agent, an Affected-Cognizant and a Phenomenon. Again, we start from the left and work to the right.

STAGE 1: T2 for Affected

'Ike heard from Ivy that you were coming' to 'What happened to Ike was that he heard from Ivy that you were coming'. (TEST PASSED.)

NOTE: As in example 3, 'being told something' counts as 'something happening to one'.

Stage 3: T15 for Cognizant

'Ike heard from Ivy that you were coming' to 'Ike knew / thought that you were coming as a result'. (TEST PASSED.)

Stage 3: T1 for Agent

Stage 3: T1 for Agent

'Ike heard from Ivy that you were coming' to 'What Ivy did was to cause Ike to hear that you were coming'. (TEST PASSED.)

NOTE: This is the special case when the normal version of the test for Agent (T1) need to be supplemented.

Stage 4: T16 for Phenomenon

'Ike heard from Ivy that you were coming' to 'Ike knew that you were coming' (as a result)'. (TEST PASSED.)

All of the other compound roles can all be handled in a similar way. Remember that, when there is a covert role, you should give it a temporary formal representation in the clause before applying the tests, e.g. by supplying 'someone', something', 'somewhere' or 'some time'.