English Perception Verbs

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Abstract

This thesis is an investigation into the syntax and semantics of English verbs of sensory perception. There are six chapters including the introduction and the conclusion. In the first chapter, I outline the classes of verbs that are investigated: they are described by the verb for the auditory sensory modality, so there are LISTEN-class, HEAR-class and SOUND-class verbs. Each class of verbs includes a verb of vision, hearing, feeling, smelling and tasting. I outline the reasons for including some verbs in the study and excluding others. I also discuss models of semantic structure and linking between syntax and semantics that have been proposed before. The final section of this chapter outlines the theoretical model used in this thesis.

In Chapter 2, I describe the syntax of the various constructions that the selected verbs may occur in on a class-by-class basis. In Chapter 3, I describe the semantics of HEAR-class verbs. The majority of the chapter is taken up with a consideration of the semantics of SEE; the analysis of SEE provides a basis for the study of the remaining verbs of the class. In Chapter 4, I describe the semantics of LISTEN-class verbs, drawing out the differences and similarities between those verbs which select for an object, and LISTEN, which is complemented by a prepositional phrase, and LOOK, which does not have a complement. In Chapter 5, I describe the semantics of SOUND-class verbs. In this chapter, I describe the differences between three semantic classes of SOUND-class verbs, looking at their interaction with restrictions on the complementation of the verbs.

Chapter 6 is the conclusion. I draw some general conclusions about the nature of semantic structure and I discuss some of the verb-particular observations that my study throws into relief.
Acknowledgements

Most of all, I would like to thank Dick Hudson, who supervised me, and Rosta, and, in particular, Caroline Lewis.

I owe a debt of gratitude to Sylvia Adamson, Gill Brown, Bill Croft, David Denison, Peter Matthews, Terttu Nevalainen, and Susan Wright.
ADDENDA and CORRIGENDA

21 Example (15a). This is probably a metaphorical use of SEE rather than an example of SEE with just ‘gazing’ as part of its meaning as I claim in the text. Some people do not find examples that purport to show SEE meaning only that the perceiver’s gaze has reached the percept convincing. It should be noted that the argument is essentially one for the decomposition of the sense of SEE. If you agree that the sense of SEE can be decomposed into an element of where the perceiver’s gaze meets the percept and another element where the perceiver forms a mental image of the percept, then whether or not you find such examples convincing is immaterial: the examples are only invoked to support the case that the sense of SEE can be decomposed.

63 The pied-piping criterion for adjuncthood is simply wrong. This obviates the case made from the examples in (15). First, the examples in (15a-b) are actually fine: empty complement prepositions can be pied-piped. Second, some semantically full prepositions are, by the other criteria, complements.

124 when the sense of SEE is an instance of gazing --at this point in the text, the sense of SEE has been decomposed into a ‘gazing’ element and an ‘image-forming’ element. The claim is that when the sense of SEE involves gazing, it constitutes an example of gazing and so aspects of its meaning draw upon the properties inherent to gazing, such as the aktionsart of gazing. The sense of SEE belongs in a category of gazing, so that the properties of the sense of SEE are the same as the properties of gazing. Essentially, the claim is that the properties of a word’s meaning are subject to default inheritance (discussed on pp 51-52) in much the same way as a word inherits various properties such as its form from its lexeme.

144-145 The FROM examples. The examples with FROM are intended to display the secondary theme, or perceptual trace of the sense of SEE. However, the examples in (24) and (25) are perhaps not as convincing as they might be. The following are better examples, one for SEE, and one for HEAR.

[i] Every day, I go down to the pier for one last look at the sea, and an inhalation of ozone. It’s always very comforting to see the lightship winking away on my left. It reminds me of how many lives must have been saved just through its being there. But yesterday, something was very wrong. I stood in my normal place on the pier, and looked out to sea, but I couldn’t see the lightship in its usual place. Instead, I could see it from my right, winking away as usual, but on the wrong side of the sound.

[ii] The man at number 25 is very odd. Every day as I walk past I hear him doing his Mario Lanza impression. I usually hear him singing from the bathroom: he evidently likes the echo. This morning though, I heard him from the coalhole. He must have lost his keys, or found a better echo chamber.

155 The examples in (38) are, in fact, perfectly grammatical. The conclusion must be, therefore, that the structure of the examples in (38) is exactly the same as the structure of Jane can see trees for hundreds of miles. That is, as long as the percept can be distributed along the line of the gaze, there is no problem with a
phrase like *to the wall* as an adjunct of *see*.

261 The earliest instances --a caveat is in order. There is insufficient data explored here and later (p 287) to substantiate this claim. On further examination, the Fourteenth Century examples look much less certainly attributary at all times. First, some Fourteenth Century examples look as though they are cases where the perceiver has directed their sight in a certain manner, as in *[he]...loked grym as he were wood*, an example where the statue of Mars looks on in a grim way. Second, some early examples could be evidential rather than attributary.

283 The evidential-2 sense is, arguable, the most subjective of the three possible senses. The reason for making this assertion is that the only participants in the situation denoted by a verb with an evidential-2 sense are the proposition and the speaker. The evidential-1 sense, on the other hand, makes the subject a participant in the situation denoted by the verb and so it is less focused on the speaker's interpretation. However, this is not to deny that evidential-1 senses may also be subjective, and that such fine-grained judgments are subject to other factors such as what the context offers.

284-285 Example (57). This has an evidential sense rather than an attributary one. My claim that it is attributary is wrong.

286 The discussion of (55) [p 283-284] is organised back to front. It is *looked holwe* that provides the evidence for an attributary analysis, not *looked sobrely*.

The analysis of (61) is wrong. The pronoun *hym* is probably a reflexive dative; this is an attributary example (not, as claimed, an evidential-2 example), and it is *holwe* that provides the best evidence for this.
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Chapter 1
Introduction

1.1 Motivations and data
In this thesis I explore the semantics of the perception verbs in Table 1 below. The table is divided into three classes of verbs which are grouped according to the semantic role of the subject.

Table 1

<table>
<thead>
<tr>
<th>Agentive verbs</th>
<th>Experiencer Verbs</th>
<th>Percept Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOOK (AT)</td>
<td>SEE</td>
<td>LOOK</td>
</tr>
<tr>
<td>LISTEN</td>
<td>HEAR</td>
<td>SOUND</td>
</tr>
<tr>
<td>FEEL</td>
<td>FEEL</td>
<td>FEEL</td>
</tr>
<tr>
<td>SMELL</td>
<td>SMELL</td>
<td>SMELL</td>
</tr>
<tr>
<td>TASTE</td>
<td>TASTE</td>
<td>TASTE</td>
</tr>
</tbody>
</table>

The classification according to the semantic role of the subject is indicated in the columns of Table 1. The verbs in the first column all have agent subjects, those in the second column all have experiencer subjects, and those in the third column all have subjects which are the stimulus of perception, or the percept. We can distinguish between the agent subject verbs and the experiencer subject verbs according to whether they can collocate with DELIBERATELY¹ or not. The ability to occur with this adverb is sometimes used as a test of agentivity, and I shall use it here as an initial diagnostic.² The use of DELIBERATELY is not relevant for identifying verbs with percept subjects because they may, or may not, occur with DELIBERATELY depending on whether the subject is animate, and depending on whether the situation is one over which the percept might have any control.

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¹ The representational conventions are that capitals represent lexemes; italics represent words in utterances or texts; and single quotation marks represent concepts or meanings.
² I am assuming that if a verb does not readily occur with DELIBERATELY it is an example of involuntary perception. Agentive verbs, those that can occur with DELIBERATELY, cannot be examples of involuntary perception.
(1) a. Jane was deliberately listening to the music  
    b. !Jane deliberately heard the music/ !Jane was hearing the music  
    c. Jane (deliberately) sounded bored

In (1a), I have also shown was...listening in the present progressive because the ability to occur with progressive aspect is often taken as a criterion for a verb’s having an agentive subject; the fact that HEAR is peculiar with both the adverb and with the progressive aspect suggests very strongly that its subject is not agentive. The rows of the table are indicative of the sensory modality of perception.

For perspicuity, the verbs will be identified by a front slash and the initial letter of the semantic relation of their subject: I shall want to make a distinction between FEEL/A and FEEL/P, for example. The classes of verbs will be referred to according to the auditory modality, as LISTEN-class, HEAR-class, or SOUND-class verbs. Therefore, FEEL/A means “LISTEN-class FEEL”. The sensory modalities that I shall refer to are seeing, hearing, feeling, smelling and tasting.

There are two main relevant questions. First, how are the different words within the sensory modalities related? I take it that there is a common thread of meaning between all of the words along any of the rows in Table 1. It is one of my concerns to find out what semantic factors are constant for each sensory modality. Secondly, what are the semantic criteria according to which the columns are formed? If they are a reflection of some aspect of semantic organisation, what is it? How important is it?

These questions are intimately bound up with the issue of how we write our semantic descriptions. How much information is it appropriate to include in the semantics? A minimum semantic description might be as much as is necessary to be able to come up with a correspondence between syntax and semantics; such a minimum might, however, be far too little to demonstrate the relation between the lexemes. A maximum semantic description could include all of conceptual structure. I assume, therefore, that the amount of information that we have to include in our semantic entries is sufficient to show the relations between the words in Table 1, and sufficient to distinguish them from each other.
These lines of enquiry are related to other important questions in lexical semantics. At least one such issue is whether syntax is predictable from semantics or not. This question has been addressed in works like Chomsky (1981), Fillmore (1968), Grimshaw (1990), Levin and Rappaport (1988), Levin and Rappaport Hovav (1991), Jackendoff (1983, 1990, 1993), Pinker (1989), and Rappaport and Levin (1988), to name but a few. The issue is important, because it is concerned with the extent to which syntactic subcategorisation has to be listed in the lexical entry for a word and to what extent syntactic subcategorisation is actually predictable from the semantic entry for a word. It is relevant here, because as well as the semantic differences which are evident in the three classes of verbs in Table 1, there are differences of complementation pattern which we can observe, too. Some examples are presented in (2).

(2) a. Peter looked at the picture/*that the picture was interesting/*nice  
b. Peter saw that the picture was interesting/(*at) the picture/*nice  
c. the picture looked nice/*at the picture/*that it was interesting

While the LISTEN-class verbs can only have a noun as their complement, or perhaps a prepositional complement, the HEAR-class verbs can have a clausal complement of some kind, and the SOUND-class verbs have a predicative complement. Why? This fact is, presumably, related to the different semantics of the classes, but how, exactly?

There is a further factor. None of these questions can be theoretically naive, because different theories will make different predictions about the nature of semantic representation, about the relation between syntax and semantics, and about the possibilities of indicating relatedness between lexemes. This thesis is an exercise in semantic description within the theory of Word Grammar (henceforth WG), as outlined in Hudson (1984, 1990, 1992, 1995b). The description that is provided in these pages will examine the verbs in their possible complementation patterns. The complementation patterns themselves may reveal systematic regularities that are best explained in terms of the semantics of the words concerned, as Levin (1993) suggests. Some evidence in favour of such a suggestion is that aspect is one area of semantics
where the significance of complementation has been amply demonstrated. Telicity is a property that is related to the countability of the objects of verbs like DRINK for example (Dowty, 1979; Mourelatos, 1978; Brinton, 1988).

My ambition in this thesis is constrained to providing a description of the semantics of the words listed in Table 1, in relation to a discussion of their complementation. I do not expect to establish whether syntax is predictable from semantics or not, neither do I anticipate making any major theoretical advances.

1.2 Semantic issues

1.2.1 Related perception words

It is not necessarily obvious that the words in Table 1 form a separate class of their own, and that other words should be excluded from this study. In this subsection, I consider a range of other candidates, WATCH, PERCEIVE, OBSERVE, NOTICE, GLIMPSE, and SPOT.

Rogers (1973) does not include LOOK/A as the word for the visual modality in his column for LISTEN-class verbs; rather, he argues that WATCH is the appropriate lexeme. I think that it is clear that LOOK/A is more appropriate than WATCH. Rogers' judgement was motivated by his desire to establish a transformational account for the relation between LISTEN-class and SOUND-class verbs because he thought that there was a certain resemblance to Psych-movement, as outlined in Postal (1971). My theoretical model makes different requirements of me. I shall not proceed on the basis that these classes of verbs are transformationally related to each other. Furthermore, I am looking for systematic aspects of meaning that the verbs in Table 1 have in common. The meaning of WATCH entails that of LOOK/A, but not vice versa. ‘Watching’ is a special kind of ‘looking’, as are

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3 Rogers changed his mind between 1971 and 1973 when he defended his thesis. In the earlier work, he thought that the relationship was between SOUND-class verbs and HEAR-class verbs but when he wrote his thesis, he assumed that there was a derivational relation between SOUND-class verbs and LISTEN-class verbs. The change of heart was made possible by replacing LOOK/A with WATCH, a decision that I take to have been a mistake. It was motivated by the fact that LOOK/A does not subcategorise for a direct object, making a transformational relation between LOOK/A and LOOK/P, where the subject of LOOK/P was transformationally derived from the “object” of LOOK/A, quite impossible.
'squinting' and 'gazing'. It is as inappropriate to claim that WATCH is the relevant lexeme at this point as it would be to claim that SQUINT or GAZE was.

In addition, the meaning of WATCH includes the notion that the thing which is being watched is expected to change. Typically, a watched object is animate and it is being watched to observe some aspect of its behaviour. If it is not animate, it must still have the potential for change. I take it that we watch precious objects, because they are at risk of theft, and we wish to prevent their undergoing a change of ownership. In the case of the other words in the LISTEN-class, it is not expected that the percept will change: you may listen to a single note at a constant volume indefinitely; you may feel an unchanging mole on your upper lip indefinitely, too; the potential for change is not required of the percepts of any of the LISTEN-class verbs.

It may be argued that WATCH is relevant to my concerns, although not as centrally as the verbs in Table 1. I agree. If I am able to establish a convincing account for the semantic relatedness of the verbs in Table 1, I expect that it will extend to include WATCH as well or, at the very least, that it should be possible to sketch the lineaments of how WATCH might be related to the verbs in Table 1, precisely because 'looking' will be part of the definition of WATCH and other similar words.

Other potential verbs for inclusion, such as PERCEIVE, OBSERVE, NOTICE, GLIMPSE, and SPOT, are discounted for different reasons. In terms of the semantic role of their subject, they belong in the HEAR-class. We can test for this by showing that it is not possible to have the adverb DELIBERATELY modifying the verb. As it is not, it follows that it is necessary to find out what other aspects of their semantics these verbs have in common with HEAR-class verbs.

(3) a. !Peter deliberately perceived the situation
   b. !Jane deliberately observed the cat in the garden

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4 The convention is that 'watching' is the sense of WATCH.

5 The DELIBERATELY test is a test for purpose or intention, and therefore agency, on the part of the subject, as we shall see in section 1.2.6 If DELIBERATELY modifies a verb, then the subject of the verb is acting intentionally; I assume that intention is a good enough reason to claim that a participant in a situation is an agent. It is possible to have DELIBERATELY
c. Peter deliberately noticed the boys' bad behaviour
d. Jane deliberately glimpsed the enemy flag
e. Peter deliberately spotted them crossing the road

The examples in (3) show that these verbs are all examples of involuntary perception. If they belong with any of the classes in Table 1, then it is with the HEAR-class. There is good evidence, however, to suggest that these verbs are not central to the enquiry here, and that like WATCH, an account of their properties will in fact rest on the description of the verbs in Table 1 being in place first.

The first reason why they are not central to my enquiry is that, apart from GLIMPSE, they are all neutral in terms of their sensory modality as the examples in (4) show.

(4)  
   a. Jane perceived the garlicky odour/salty flavour/gritty texture of the soup  
   b. Jane observed the garlicky odour/salty flavour/gritty texture of the soup  
   c. Peter noticed the garlicky odour/salty flavour/gritty texture of the soup  
   d. Jane spotted the garlicky odour/salty flavour/gritty texture of the soup

GLIMPSE belongs in the realm of visual perception.

(5)  
   a. Peter glimpsed “The Scream” as the thieves were running off with it  
   b. *Jane glimpsed the smell of garlic as she ate the soup

A modality neutral verb of perception is presumably further away from the “basic level category” (in Lakoff’s 1987 terms) of what constitutes perception than a verb that actually specifies the perceptual channel. The second reason is that these verbs also have a more clearly defined temporal element than the HEAR-class verbs of Table 1. NOTICE, GLIMPSE and SPOT are all punctual; OBSERVE and

with OBSERVE in examples like (i) *Peter is deliberately observing Jane’s first lesson though not those like (ii) *Peter (*deliberately) observed the accident. We should assume two senses of OBSERVE for now, an active sense with an agentive subject and a stative sense, where the subject is quite definitely not agentive.
PERCEIVE are durative. As these five verbs can all apply to vision, and as GLIMPSE only has a visual meaning, we can compare them with SEE. SEE may be punctual or durative, depending on the semantics of its complement.

(6)  
a. Jane saw Peter cross the road  
b. Peter saw Jane crossing the road  

In (6a) *saw is punctual. In (6b) it is durative. SEE does not specify its temporal semantics itself; its complement does.

(7)  
a. *Jane perceived/observed/noticed/glimpsed/spotted Peter cross the road  
b. Jane perceived/observed/noticed/glimpsed/spotted Peter crossing the road  

In (7a) the main verbs under question are quite incapable of occurring with a bare infinitive complement. In (7b), they can all occur with an -ing participle complement, but the temporal semantics are not specified by the nature of the complement. The complement is durative in all cases in (7b), but each of the main verbs in (7) specifies its own temporal semantics. Only perceived and observed are durative, the others are all punctual. This fact is peculiar: why do the punctual verbs not occur with cross? As far as complement selection for PERCEIVE, OBSERVE, NOTICE, GLIMPSE and SPOT is concerned, the punctual/durative dimension is not relevant to complement selection. What is clear is how different from HEAR-class verbs all of these verbs are as far as their complement selection is concerned. I return to the issue of complement selection and the duration of HEAR-class verbs in Chapter 3.

In these two respects, therefore, these verbs are different from HEAR-class verbs. In addition, they cannot take the remaining wide range of complements that HEAR-class verbs are able to. It is possible to have examples like I heard it raining but not I perceived it raining. These verbs also differ from HEAR-class verbs in their ability to occur in the simple present, or the present progressive. HEAR-class verbs are oddly uncomfortable in both the simple present and the present progressive, and it appears that to occur in the present tense, they have to depend on CAN.
(8)  
  a. !Jane sees Peter
  b. !Jane is seeing Peter
  c. Jane can see Peter

These facts are not exactly the same for OBSERVE et al. NOTICE cannot depend on CAN at all, and all of the other words collocate with CAN more happily when there is a place adverbial like from here in the following examples. No place adverbial is necessary with HEAR-class verbs.

(9)  
  a. Jane can observe Peter !(from here)
  b. Jane can perceive Peter !(from here)
  c. !Jane can notice Peter !(from here)
  d. Jane can glimpse Peter !(from here)
  e. Jane can spot Peter !(from here)

Perhaps more tellingly, the behaviour of OBSERVE, PERCEIVE, NOTICE, GLIMPSE, and SPOT is exactly as we should predict from their temporal semantics.

(10)  
  a. Peter is observing the animals/ observes the animals
  b. Peter !is perceiving/ perceives the animals
  c. Peter !is noticing/ notices the animals
  d. Peter !is glimpsing/ glimpses the animals
  e. Peter !is spotting/ spots the animals

OBSERVE is fine in the present progressive. In the simple present, the best interpretation is a habitual one. This fact alone makes it potentially very different from the verbs of the HEAR-class. PERCEIVE is fine in the simple present, and this

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6 This example is to be read as an example of physical perception, and not in the sense that Jane is dating Peter.
7 The uncertainty over the aspectual classification of OBSERVE at this point reflects the uncertainty that I felt over its ability to collocate with DELIBERATELY.
also makes it very different from the HEAR-class verbs. It is stative. The remaining three verbs are all punctual, and they are not iterable, so they cannot occur in the progressive. They can occur in the simple present.

All of these facts indicate that PERCEIVE, OBSERVE, NOTICE, GLIMPSE and SPOT are not central to the concerns of the thesis. This discussion raises another point. Rogers (1973), claims that there are four classes of perception verb, because the HEAR-class divides into punctual and durative verbs. His argument rests on the observation that SEE may be either stative or punctual depending on the nature of its complement. As we have shown here, there is no systematic way in which HEAR-class verbs belong in one group with NOTICE if they are complemented by a bare infinitive clause, and belong in another with PERCEIVE if they are complemented by a clause headed by an -ing participle. HEAR-class verbs have a very different complementation from other verbs and, more importantly, their aktionsart is determined by the aktionsart of their complement, whereas the verbs discussed here have a fixed aktionsart.

There are other verbs that it may be appropriate to discuss such as SEEM, which has syntactic and semantic facts in common with SOUND-class verbs and HEARKEN (TO), HARK (AT), GAZE (AT) and STARE (AT) which have relevance to the discussion of LISTEN-class verbs. SEEM is mentioned in Chapter 5 and the other verbs, in passing, in Chapter 4.

1.2.2 Polysemy
The verbs under discussion do not only have the experience of physical perception as their meanings. We could include the question of what it is that links ‘understanding’ to (physical) visual perception in I see what you mean, or why look after has a particular idiosyncratic meaning.

The polysemy of perception verbs is discussed in, for example, Cooper (1974b), and Lehrer (1990). Landau and Gleitman (1985) discuss the meaning of SEE for a blind child. Sweetser (1990) provides an excellent discussion of the multiple senses of verbs of perception, especially the extended senses of SEE and HEAR. I do not see this thesis as an exercise in the analysis of polysemy. On the
other hand, I shall need to discuss certain non-physical senses of verbs of perception. For example, when SEE is complemented by a THAT-clause, it may be interpreted as an example of physical perception; alternatively it may be a sense of SEE where the THAT-clause is a reporting clause, and if the sense of SEE has any vestige of physical perception about it, then it is merely as an indication of the means by which the information came to hand.

(11) a. I see that Jane has been elected president
    b. I see that Peter is crossing the road

(11a) is a sentence which could felicitously be used in a context such as reading the paper, where the information was gathered visually. (11b) may possibly be used of a context where the speaker can observe the road and the activity on the road. It may be a possible answer to a question such as *what do you see?* However, I find such an interpretation of (11b) a little implausible, and would suggest that it is unusual for SEE to be complemented by a THAT-clause when it has direct physical perception as its sense. It is more likely when the physical perception is mediated, and if I were a security guard observing the action on a given street through security cameras, then I should be far more inclined to utter (11b) than if I were a speaker with an unobstructed or unmediated view of the road. It is in examples like those in (11) that the meaning of SEE comes close to that of ‘understanding’; and so I have to stray a little way from direct physical perception in the course of the discussion.

A further example where I shall not be able to constrain myself exactly to direct physical perception is in my discussion of SOUND-class verbs. These verbs have a meaning that is complicated, and which goes far beyond simple physical perception as we can see in (12).

(12) a. The cake looks pink (!but it isn’t)
    b. The cake looks nice (but it isn’t)
There is a difference in the meanings of the examples in (12) which is brought out by the material in brackets. (12a) is concerned with visual evidence and it is odd to suggest that an attribute of the cake, which is information gathered visually, should turn out not to be the case. (12b) is concerned with a mental evaluation or belief of the evidence. In this case, it is more straightforward to override the assessment with the material in brackets. In both cases, we have moved away from direct physical perception as the central element in the verb’s meaning.

I think that an appropriate course of action at this point is to provide an account of the polysemy of SEE. This is for two reasons: the first is that in the subsequent discussion it should be possible to isolate exactly which sense of this verb is under discussion; the second is that it is necessary to recognise that the possible implications of work in lexical semantics extend far beyond the primary concerns of this thesis. I discuss SEE, rather than any of the other verbs in Table 1, because it displays a high degree of polysemy that moves a long way from haptic perception. SEE has meanings that are associated with thought, understanding, and cognition. The following discussion is quite short, and is merely intended to be suggestive.

1.2.3 The polysemy of SEE

The following discussion concentrates on the way in which different senses of SEE are related to each other. I shall give some indications of the range of senses that are available, and I shall give examples, most of which come from the Oxford English Dictionary (henceforth OED), although I have modified some of them slightly. The discussion is not exhaustive, but is intended to be suggestive of how we might consider relations between the senses of words.

The senses of SEE that I shall discuss are the ability to see, mental comprehension, active perception, and personal knowledge or experience.

- Physical perception through the modality of vision.

(13)  
  a. I saw you through the area railings
  b. I saw the tears start from his eye
c. they have just seen the little party crossing the summit

In the sense of physical perception, as in the examples in (13), there is typically a perceiver, the subject, a percept, the object, and optionally the object of SEE may be the subject of a participle, or an infinitive. As far as physical perception is concerned, it does not matter whether the percept is simply observed, or whether it is observed participating in a particular situation; the verb SEE has the same sense in either case. Does physical perception have a prototype?

We could look at the case of CLIMB, as discussed by Fillmore (1982), Hudson (1990), Jackendoff (1990) and Taylor (1989) to see whether there are comparisons that we can draw. Two aspects of the meaning of CLIMB have to be borne in mind; either of them is a sufficient condition for CLIMB to be used. The different senses of CLIMB appear in different contexts. The elements in the meaning of CLIMB are 'clamber', and 'ascend'. Thus, the plane climbed to 20000 feet is a legitimate use of CLIMB. Also, the cat climbed down the tree is an appropriate use of CLIMB: the cat is clambering even though it is not ascending. The protoypical use of CLIMB is the one where it means both 'ascend' and 'clamber' as in the cat climbed to the top of the tree.

Jackendoff (1990: 36) gives the following examples which suggest that the prototype for the meaning of SEE is that (i) the perceiver's gaze makes contact with the percept, and that (ii) the perceiver has a visual experience of the percept.

Jackendoff (1990: 290) states that this analysis of the sense of SEE, which is also found in Jackendoff (1983), draws on Miller and Johnson-Laird (1976).

(14)  a. Bill saw Harry
   b. Bill saw a vision of dancing devils
   c. Bill saw the sign, but he didn't notice it at the time
   d. *Bill saw a vision of dancing devils, but he didn't notice it at the time

[=Jackendoff's (25)]
(14b) fits requirement (ii), (14c) fits requirement (i), and (14d) fits neither. (14a) is an example of prototypical vision, where both requirements are met. As in the case of CLIMB, either requirement is a sufficient condition for the use of SEE, and neither is necessary. We can find examples from the OED which meet condition (i), as in (15a), or condition (ii) as in (15b):

(15) a. the satellite...can see more of the the earth...
   b. he saw himself, in his mind’s eye, put meekly into a hackney coach

The majority of examples of SEE with this sense in the OED fit the prototype.

• Ability to see. Typically this occurs in collocation with CAN in modern English.

(16) a. it was a bad day to see
   b. he was generally so drunk he could not see
   c. Peter can see clearly with his new glasses

To see something entails that you are able to see it, in that the prototype for the sense of SEE involves both a mental image and a gaze. I discuss this sense further in Chapter 3. Notably, the sense ‘ability to see’ typically collocates with CAN. This is quite unremarkable in that CAN is used in this same fashion with a large number of other verbs, but it is telling that SEE is often only marginally acceptable unless it occurs with CAN. I argue that the reason why ‘ability to see’ is intimately bound up with the sense of SEE is contingent on the direct embodiment of SEE. Being able to see something entails seeing it; having your sight restricted through deficient eyesight, or through bad weather, or through some other impediment to sight often results in not being able to see something. Naturally, seeing is only possible if there is an ability to see, and it is this fact that conditions the common occurrence with CAN.

• To comprehend mentally. This is a metaphorical extension of the physical sense of SEE where physical perception is not an essential part of the sense of SEE. It is the
relation between this, and related senses of SEE and the physical sense that Sweetser’s (1990) discussion concentrates on. Examples are found in (17).

(17) a. it was easy to see the course which the government would take
    b. I see that you are speaking your mind
    c. everyone must see this to be highly absurd

In these cases, there are differences in meaning that we have to look at: (17a) means ‘predict’ and is related to the metaphorical use of *course*. In this case, the course is a course of action, taken out of its localist sense, where it means a physical path, into a sense where it refers to the direction that the government’s political decisions will take. The whole sentence, then, works around a number of metaphors, in the sense of Lakoff (1987) and Sweetser (1990). As with the other examples in (17), (17a) comes in the category that Sweetser calls “intellection”. Here, seeing is related to comprehension.

In the next sentence, there is no percept that can be seen, either mentally, in a metaphorical sense, unlike (17a), or in a direct physical sense. This example is even more clearly an example of intellection; it means ‘understand’. Sweetser claims that the metaphor by which seeing is analogous to understanding is due to seeing being our primary source of data about the world. Furthermore, vision gives us data from a distance, which enables us to isolate that data from our emotional faculties; in this respect, vision is quite different from touch or feeling. THAT-clauses typically introduce indirect percepts after SEE, and their content is not directly perceivable by any means. Here, this fact is made manifest: there is no way that *that you are speaking your mind* could refer to something that was visually perceived. I look further at the relation between complementation and meaning in Chapter 2; for now it is worth observing that THAT-clauses are typically associated with non-physical perception.

(17c) shows that there is a relation between the complementation of a verb and its meaning; here the *this to be highly absurd* construction is semantically like the THAT-clause complement: its referent is a proposition rather than an event. See...
means 'understand' or 'recognise' in this sentence, it is clearly related to both the other senses in (17), but it is not so transparently metaphorical as is (17a) for example.

- Active perception. This sense of SEE means something like 'go and see', it is quite closely related to LOOK/A.

(18)  
   a. it was worth going miles to see  
   b. I saw the "Mona Lisa" when I went to the Louvre

In (18b), saw does not just fulfill the prototype for the sense of SEE that was sketched out in the discussion of the examples in (14). It does entail direct perception, but it also indicates a further element of effort. This additional notion of effort is particularly present in (18a), where the two elements are spelt out; in (18b), it is present because the "Mona Lisa" is static, and cannot be seen without making a particular effort to go and find her location. This sense extends into 'meet': it is possible to say I saw my sister yesterday, meaning that I met my sister yesterday, where saw is clearly related in sense to the instances of SEE in (18). The difference rests in the fact that the SEE of (18a) includes the sense of physical perception as a part of the purpose of this sense of SEE, whereas the sense of going to meet someone does not have the physical perception of them as its primary intention, rather it is a consequence of meeting them. This sense of SEE is therefore only related to the sense of LOOK/A in a partial way, by virtue of the element of agentivity which must be assumed.

- Personal knowledge or experience (this is the final sense of SEE that I discuss).

(19)  
   a. I won't see sixty again  
   b. she saw her son err
In (19a), the sense of SEE is that of ‘experience’; the speaker of the sentence means that they will not experience being sixty again. In (19b), the issues are marginally more complicated: as well as meaning ‘experience’, this example possibly includes the sense of direct physical perception, and could mean something like *she watched him err*. Alternatively, it could mean that she saw that he had erred.

It is clear that in identifying different senses of SEE, we may not be able to establish exactly what those sense are in all cases: there is a degree of overlap between some of the senses. Furthermore, in looking at polysemy, it becomes clear that as predicted by Lakoff (1987), there are at least two ways of extending the meaning of a word. Some extended senses are arrived at through regular metaphorical processes. Others include extensions of meaning which do not involve a metaphorical mapping from one domain to another, but which involve conflating additional meaning with the core of the sense of the verb. Despite being convinced that an exploration of the different possible extended senses of all of these verbs would be an interesting and extremely useful study, I should state that I have no intention of pursuing it beyond the discussion in this section. My intention here is to identify the issues which would need to be addressed, and also to be able to state in subsequent chapters which of the possible senses of SEE is under discussion. The initial sections of Chapter 3 are concerned with a sub-part of this polysemy.

1.2.4 Semantic relations

The discussion to this point has suggested that the complementation of the verbs in Table 1 will be significant in the analysis of their meanings. One strategy is Fillmore’s Frame Semantics (Fillmore and Atkins, 1992; Fillmore, 1982, 1985; Atkins 1994). In this model, words which typically collocate with the word under discussion provide some idea of the underlying beliefs, attitudes and background to the word’s meaning.

Another approach to semantics which is concerned with the complementation of a word is the “thematic roles” approach. Perhaps the most famous example is the Gruber/Jackendoff system (Gruber, 1965, 1976; Jackendoff, 1972, 1983, 1990, 1991,

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8 “Semantic relations,” “semantic roles,” “thematic roles,” “thematic relations,” and “theta roles” are all (for my purposes here) synonymous terms.
1993, 1996; Pinker, 1989), but there are others such as Fillmore’s (1968, 1977) Case Grammar; Dowty’s (1991) “proto-roles” approach; Talmy’s system using localist and force-dynamic elements (1983, 1985a, 1985b, 1988); and the numerous systems where semantic relations are used as part of a general grammatical theory. Examples include Dik’s Functional Grammar (Siewierska, 1991), Lexical Functional Grammar (Bresnan, 1982; Bresnan and Kanerva, 1989; Bresnan and Moshi, 1992), Langacker’s Cognitive Grammar (1987, 1991), and Halliday’s Systemic-Functional Grammar (Butler, 1985). Thematic roles also play a part in Government and Binding Theory (Chomsky, 1981; Haegeman, 1991; Radford, 1988) but as this theory is in a period of rapid evolution it is unclear how great a part thematic relations will play in any future version. The existence of semantic roles, or their relevance to linguistic description, is questioned in Ravin (1990).

The systems listed above do not have a great deal in common. Some are primarily interested in semantics without having a great deal of concern for whether semantic relations have a part to play in grammatical descriptions; this approach is probably true of later Jackendoff. Other theorists are little concerned with the actual semantic content of semantic relations. All that is required is for there to be some semantic relation, and once that has been determined its content is immaterial. This approach is true of Chomsky. These theories treat semantic relations as argument-indexing devices. Some other theorists use semantic relations to place constraints on the grammar without paying much attention to the status of those relations. For example, Brekke (1988) has an Experiencer Constraint which limits the class of verbs that can undergo -ing participle adjective formation to a class of verbs with non-subject experiencers. Similarly, Maling (1994) has a constraint (applying to themes) on middle-formation in German. Typically, constraints formulated in this way apply either to diathetic alternations or to word-formation. The function of such constraints is to limit the applicability of a rule. Brekke (1988) and Maling (1994) are not concerned about the semantic content or the syntactic status of semantic roles.

From the above, it is possible to identify at least three uses of the notion of semantic relations in linguistic theory. First, a semantic relation may indicate a participant of a particular kind in a situation of a particular type. This is a semantic
characterisation. Secondly, a semantic relation may be used within the syntactic description. Radford (1988) argues that whether a thematic role has been assigned to a dependent of a verb or not is a useful diagnostic of whether that dependent has been raised. Finally, a semantic role may be used to identify a semantic class of verbs which may undergo a particular grammatical operation as in the Brekke and Maling papers discussed above.9

An influential solution to the problems caused by this wide range of usages has been that of Levin and Rappaport Hovav. They have argued convincingly in a number of papers (Levin and Rappaport, 1986, 1988, 1989; Levin and Rappaport Hovav, 1991, 1992; Rappaport and Levin, 1988) that grammatical rules make no mention of particular semantic relations at all, although they do refer to a level of representation which they call Predicate Argument Structure (henceforth PAS). PAS indicates whether a participant in a situation is an argument of a verb or not, and it also identifies whether the participant is strictly subcategorised, or whether it is the "external" argument. The external argument is equivalent to a valency list subject. Levin and Rappaport Hovav have shown that a number of phenomena which were assumed to be related to particular semantic relations elsewhere in the literature are in fact tractable entirely within a PAS system. These include adjectival-passive formation, -er nominalisation formation, and the locative alternation. However, Levin and Rappaport Hovav's PAS raises questions about its status. Is it syntactic or semantic? Does it consist of gross semantic categories that are tied to syntax in some way? How are the different participant types to be identified? How is it related to conceptual structure?

Elsewhere, Levin and Rappaport Hovav have argued for the need to identify the semantic classes of verbs which also belong to particular syntactic classes. Instead of arguing that there is a constraint referring to a particular semantic relation and there is a grammatical rule referring to that relation, Levin and Rappaport Hovav (1991) claims that the correspondence should be stated in terms of an explicit semantic

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9 A further, interesting, addition to the range of uses semantic relations are put to is found in Carlson and Tanenhaus (1988). They argue that semantic relations are responsible for coherence in discourse and that they are part of the way different elements in processing interact.
analysis which is more thorough than a mere statement of semantic relations. That is, if there is a particular regularity, such as a valency changing alternation, which affects the semantic interpretation of the participants, then it is legitimate to look for any semantic regularity which might delimit the class of verbs that participates in the alternation. Levin and Rappaport Hovav (1991) identifies classes of verbs very carefully, so that an analysis which states that an alternation was sensitive only to objects that are themes is insufficient for their strategy.

Their analysis of CLEAR-WIPE verbs rests on a highly detailed identification of the different senses of verbs which pattern with CLEAR, CLEAN, and WIPE. They show that semantic differences go beyond a characterisation of the semantic roles of the arguments of the verbs; this fact is borne out by their observation that the semantic arguments of these verbs all have the same semantic role.

The question of how to proceed involves a lot of choices: do we want

- semantic information actually in the grammar? If we do, do we want it as semantic roles, or do we want it in some other form?
- to define semantic roles? If we do, how do we define them, and for what purpose? What function can they play in our semantic analysis?
- to have more than one level of semantic analysis, with, perhaps, a mediating level which comes between syntax and semantics?

There are answers to these questions in the WG literature, but I take it that any answer should be motivated, and not just accepted because it is part of the theory that I am assuming. We can take these issues in turn.

1.2.5 Semantic information in the grammar

It is necessary to refer to semantic information in the grammar. There are two main reasons: first, without referring to semantic information, we have no means of identifying the difference between control and raising structures as in (20) and (21); secondly, we need to refer to semantic information in the grammar to understand how passives work. (Passives are discussed in (22) below.)
(20)  
  a. Peter seems a nice man  
  b. Peter is anxious to be a nice man

(21)  
  a. Jane expects Peter to be late  
  b. Jane persuaded Peter to be late

In (20a) and (21a), there are raising structures, in (20b) and (21b) there are control structures. In essence, the difference between raising and control structures is that a raising structure does not assign a semantic relation to one of its syntactic dependents. In (20a), it is incoherent to suggest that Peter is the agent, theme, actor, goal, source or whatever of the sense of seems. Peter does not even appear to be the “seem-er” of seems, because the seem-er of seems is most felicitously taken as the whole proposition: ‘Peter (be) a nice man’. At this level of analysis, SEEM appears to be a one-place predicate in its semantics, with a proposition as its argument. (20b), however, has a different semantic structure. Peter is the “anxious-be-er” and to be a nice man looks as if it is the “anxious-be-ee”; that is, the sense of the expression BE ANXIOUS is a two-place predicate, in distinction to (20a).

A similar analysis holds for (21a-b). In (21a), the sense of expects is a two-place predicate, with Jane as one argument, and Peter to be late as the other. Peter is not the “expect-ee”: if we utter a sentence like Jane expects Peter it is Peter that is expected, not the proposition Peter to be late; in (21a), however, it is not Peter who is expected, but the whole proposition. Persuaded in (21b), on the other hand, is a three-place predicate. Both Peter and the proposition encoded by Peter to be late are semantic arguments of persuaded. Furthermore, the object’s semantic relation is stable, irrespective of whether the instance of PERSUADE occurs with an infinitive complement or not. In this respect, PERSUADE is very different from EXPECT.

This information about the different semantic structures of SEEM and EXPECT on the one hand, and BE ANXIOUS and PERSUADE on the other, is important because of their possible analysis. In the literature, the differences have been thought of as syntactic, semantic and even as a hybrid of the two. I think that as
much as the differences are semantic, the similarities are syntactic: both SEEM and ANXIOUS in (20) have a subject and a "xcomplement".\(^\text{10}\) In (21), both PERSUADE and EXPECT have a subject, an object and an xcomp.

Furthermore, the xcomps in (20) and (21) behave exactly as we should expect: they all require a subject. In (20), in both cases, the subject of the xcomp is the subject of the main verb; in (21) in both cases, the subject of the xcomp is the object of the main verb. This is the simplest analysis available, and it is translatable directly into the terminology of a number of other theories. But, as I have already noted, there are very real differences between the raising verbs and the control ones.

It follows, therefore, that exactly similar syntactic structures may mask entirely different semantic ones, and that here is the kind of difference that is observable in (20) and (21). There is no reason to assume that the kind of difference in (20) and (21) is, in fact, a syntactic one: no syntactic rules rest on the distinction between control and raising. One possible solution is simply to recognise the facts as we have observed them. A raising verb can then be defined as a verb that has one semantic argument less than its number of dependents, whereas a control verb has exactly the same number of semantic arguments as it has syntactic dependents. To include this information in the grammar, we have to accept that syntactic and semantic information are quite separate, and that the grammar makes reference to two discrete levels of representation. So far, though, the only semantic information that we have to include in the grammar is information about how many semantic arguments the sense of a word has, as opposed to the number of syntactic dependents it has.

Other semantic information that we might want to refer to in the grammar involves passivisation as in (22).

(22)  a. Jane hit Peter
      b. Peter was hit (by Jane)

\(^{\text{10}}\) "Xcomplement" is a term that WG has borrowed from Lexical-Functional Grammar (Bresnan, 1982) to replace its original term "incomplement". In essence, an "xcomplement" is a complement that is incomplete, by virtue of its having a requirement for a subject; the term is a useful generalisation from the familiar "predicative complement" found in traditional grammar. In the rest of this thesis, I shall refer to xcomplements as "xcomp"s.
Without entering into a diversionary analysis of passive, I think that it is appropriate to observe that the chief property is that one of the semantic arguments is unlinked from the position which links it to the subject. That is, the two-place predicate 'hit' becomes a one-place passive one. One of the semantic arguments is removed, specifically the argument of the non-derived verb which maps onto the subject. Consequently, in at least one grammatical rule, I have to mention the argument of the verb which maps onto the subject. As Rosta (1995) shows, mediopassives work in the same way.

So far, it looks as though the semantic information that the grammar requires (in terms of grammatical rules) is a specification of how many participants there are in the situation indicated by the verb, and a specification of which of those participants is the referent of the subject in a non-derived instance of the verb. For now, I take it that there are no other parts of the grammar that make reference to semantic information.

I shall leave the question of whether the grammar makes reference to semantic classes of verbs open: this is an issue on which I am agnostic. I am happy to accept the judgement of those like Gropen et al (1991), Levin and Rappaport Hovav (1991), and Pinker (1989), who all believe that it is possible to identify the subcategorisation of verbs from their semantic class-- that if we do have to refer to semantic classes of verbs in the grammar, we do it by referring not to particular semantic roles, but to a full description of the different semantic classes of verbs.

1.2.6 The identification of semantic relations

This issue falls into more than one part.

- Why do we need semantic relations?
- How many relations are there?

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11 On the evidence of synonyms like ALMOST and NEARLY, which have different distributions, and PROBABLE and LIKELY, where PROBABLE is not a raising predicate, but LIKELY is, despite their being synonyms, I am sceptical about the possibility of identifying the subcategorisation of verbs from the semantic class that they belong to. Examples like this are discussed in Hudson, Holmes, Rosta and Gisborne (forthcoming).
How do we identify the different semantic relations?

If we do not refer to semantic relations in the grammar why might we need to have them? So far, I have claimed that all the grammar needs is to identify how many arguments a verb has, and to identify the argument of the verb which maps onto its subject. It is also necessary to identify this argument for those cases where the verb has no grammatical subject, but it patently has some kind of semantic subject, as in imperatives (indeed, we also need a covert object for examples like go and be easy to please). Do we need a more fine grained analysis of semantic relations than this?

I think that the answer is that as far as grammar is concerned, we do not need a finer grained analysis than this. But there are two possible areas where we might find an analysis of individual semantic relations useful. One is in linking. It is clear that there is a correlation between certain semantic relations and particular syntactic ones. For example, agents always come out as subjects. In order to make any kind of sense of linking, we need to have an idea about what the possible semantic relations are, and therefore how they might be defined. It may be the case that certain semantic relations are primitives and others are not, so that not all semantic relations are definable in the same way. This issue recurs at several points throughout the thesis.

Another reason why it might be necessary to have individual semantic relations comes down to the way in which we define our semantic structures. If, like Levin and Rapoport (1988), I adopt a model of lexical subordination, where some senses are subordinate to others, I shall need to have an explication of the semantic relations involved because the subordination itself will involve some (presumably primitive) relations. It will be necessary to identify the relations that can hold between the senses of words. In a subordination model, it might also be appropriate to identify other semantic relations which can hold between a single participant and more than one sense.

The upshot is that the answer to the question of why we need semantic relations is partly contingent on fact because if we can predict the linking of semantics to syntax we have achieved a great deal. It is also contingent on theory:
some theoretical models can do without semantic relations while others cannot. I consider the issue of linking to be very important.\footnote{12}

The next issue, that of how many semantic relations there are, is an open question. The answer rests on the model that is applied to the semantics in order to determine what actually constitutes a semantic relation. It is intimately linked with the question of how we identify the semantic relations, so I shall deal with these two issues together.

We have the following options.

- We could assume a strategy like Dowty’s (1991) “proto-role” approach. In this system, there are two major semantic relations, which are designed to link to syntactic relations. The arguments of the verb will then be picked out on the “best fit” principle, so that the argument that has the most “proto-agent” properties links to subject, and the argument that has most “proto-patient” properties links to object.

According to this account, semantic relations are defined in terms of situation types so that an argument is defined in terms of the logical entailments of the situation. I can see the following problems with this proposal: how do you capture the generalisation that most indirect objects are potential or actual possessors; how do you capture the semantic relation between situation types and extra arguments like for in Peter paid Jane £5 for the bike; and how do you decide whether £5 or Jane is the proto-patient in that example?\footnote{13}

Effectively, Dowty gives us only two participant roles.

\footnote{12}{It could be argued that linking and the predictability of syntax from semantics are the same issue, but I think that they are only related. Predictability presupposes that for any semantically\textsubscript{class} of verbs X it is possible to identify the syntactic valents of a member of X. Linking merely states what is possible: if linking is probabilistic, and it is possible to come up with hard and fast rules for linking 90% of semantic participants in a situation, then this is the information that it is important to include. I think that we need to identify as many linking possibilities as we can without prejudicing the outcome as far as an investigation into the predictability of syntax from semantics is concerned.}

\footnote{13}{Using a WG interpretation of Dowty’s system, it is possible to analyse Jane paid Peter £5 for the bike like this: Jane is the subject; Peter is the indirect object; £5 is the object; for is an “argument adjunct”. On Dowty’s account, the semantic relations work out like this: Jane is the proto-agent, hence linked to subject; £5 is proto-patient, hence linked to object; Peter is the consistent semantic relation for all indirect objects; and for defines its own semantic relation to pay, like all adjuncts.}
• Alternatively, we could assume a list of ordered arguments and an ontology of situation types, as in Jackendoff’s system. In a system like this, basic situation types might include ‘state’ and ‘event’, there might also be ‘going’, ‘causing’, ‘reacting’, ‘possessing’ or even ‘perceiving’. A verb’s sense could then be decomposed into its constituent elements, so transitive MOVE, for example could be analysed as an event which is composed of a ‘causing’ and a ‘going’, something like (23). (23) is an analysis in line with Jackendoff (1983); the (1990) model is more sophisticated. I have chosen the simpler (1983) version here for the purpose of sketching a possible account.

(23) \[
\text{Event}([\text{CAUSE}([\text{Thing}\;^x])\cdot \text{Event}([\text{GO}([\text{Thing}\;^y])]))])\]

Example (23) identifies two different major ontological categories: Things and Events. CAUSE is a Conceptual Structure predicate, and part of the semantic decomposition of the sense of transitive move. GO is another Conceptual Structure predicate, and is also part of the decomposition of move. GO is embedded under CAUSE, so it is an argument of CAUSE. CAUSE has only two arguments on this model: \(x\) and \(GO\). The variables \(x\) and \(y\) are variables for the possible arguments of the whole situation comprising the sense of move. \(x\) is the first argument variable, in that it is the argument of the outermost predicate, and \(y\) is the second argument variable, in that it is the argument of the innermost predicate.

The possible problems that we run into with an account like (23) include a failure to recognise that the \(y\) variable is an argument of CAUSE as well as of GO. (23) says that there is a semantic relation that obtains between CAUSE and GO (precisely that GO is the second argument of CAUSE, which would make it the patient); however, it does not include an account of whether \(y\) is an argument of

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In addition, as ‘pay’ represents a complex situation, there are subordinate structures, and so the participants in ‘pay’ participate in ‘exchange’, and ‘counter-exchange’ too, and their semantic relations will be defined in terms of the requirements of those situations too. \(^{14}\) (23), and the discussion of (23), uses Jackendoff’s representational system. Capitals refer to Conceptual Structure predicates, italics refer to words and lexemes.
CAUSE or not. Jackendoff (1990) refines the analysis of causation by separating the action tier from the thematic tier, with the result that the $y$ variable is the affectee of the causing situation.

The advantages of an account like that in (23) are that it allows us to state very precisely what the content of a given semantic relation is. (23) tells us that $x$ is the first argument of CAUSE. Typically, the subject of transitive move is analysed as an agent. From (23) we can deduce that an agent is the first argument of CAUSE in conceptual structure. It is also possible to deduce that a theme is the first argument of GO. However, in order to make these assumptions, it is necessary to assume ordered lists of arguments, which may be undesirable. An ordered list raises the problem of how to order the list: why should one participant be prioritised over another? Indeed, the predicate calculus approach to ordered lists is one that rests on the syntactic realisation of the argument, which defeats the object. The point, surely, is to identify what is going on in the semantics, not to mirror the syntax in the semantics.


- It is also possible to assume a number of situation types, as Jackendoff does, but organise them in terms of states of affairs identified by aktionsarts. Siewierska (1991: 43) says that States of Affairs in Dik’s Functional Grammar are “situations and events that a nuclear predication may designate, viewed from the perspective of internal temporal constituency and a restrictive conception of agentivity.” Furthermore, Functional Grammar’s typology of States of Affairs is organised hierarchically (Siewierska 1991: 45-46) In an account like this, the sense of a word would not decompose, but would inherit the situation type that it belongs to. I explore hierarchies and inheritance in section 1.3.2. This sort of system is also found in Halliday’s Systemic Grammar (Butler, 1985).

- Yet another alternative is to assume a model that locates the sense of the verb in a perspective on a scene. This strategy is similar to that of Fillmore (1977), and it is found in Langacker (1987: 120-136), Talmy (1983, 1985a, 1985b, 1988) and Croft
Rather than identify a range of predicate types or situation types which define particular arguments of verbs, these authors find ways of construing scenes. They do this in two domains: one is essentially localist and involves a "figure" and a "ground", possibly a "landmark" too. These notions are identified as part of a list which may include "viewpoint", "orientation", "foreground", and "background". Another way in which a scene may be perspectivised is in looking at its force-dynamic qualities. Force-dynamics is a system which analyses the semantic encoding of energy transfer and resistance. For the authors listed in this subsection, these matters are inherently part of semantic structure, but for others like Dowty, such a gestalt-based construal of a scene is not semantic but rather belongs in the realm of "discourse pragmatics". It is, however, possible to take account of force-dynamic notions in a model based on situation types. Jackendoff (1990: 125-151) shows how this can be done. The localist element in the strategies of the authors reviewed here can be compared to Jackendoff's localist approach as well as that of Anderson (1971, 1977). Pinker (1989) adopts a strategy which incorporates elements from the localist and force-dynamic domains which he organises into a system of situation types.

- Finally, it is possible to assume a semantic model tied to syntax. As I argued in the account of Jackendoff above, this defeats the whole object: the resulting system looks like Fillmore's (1968) system, and is deeply unsatisfactory because it makes insufficient mention of relevant semantic factors, while not really contributing to the syntax at all. Such accounts are usually found in syntactic theories which use semantic relations to signal that a particular position in a syntactic configuration is associated with the possession of a semantic relation.

I think that these points demonstrate very clearly that the number of participants admitted in a semantic relations system will depend to a very large measure on the approach adopted.

The systems outlined earlier offer four main ways of identifying the participant roles. These are localist, force-dynamic, aktionsart-based, and aligned to grammatical relations. I shall leave the aktionsart-based systems for now, and concentrate on the
others. It is an interesting and empirically relevant line of research to establish to what extent these systems can be brought together. Dowty’s system, which starts from an opposing perspective to that of the other models reviewed, might provide a useful foundation from which to examine how to identify semantic roles, and how to establish the roles that are needed in a realistic system. Dowty’s approach sets out to enumerate the features that are relevant to particular semantic role types. He states that his proto-roles are “cluster concepts”. His system, therefore, potentially involves elements from all the other systems. I shall start by looking at Dowty’s definition of a proto-agent, which is given in (24).

(24) a. volitional involvement in the event or state
    b. sentience (and/or perception)
    c. causing an event or change of state in another participant
    d. movement (relative to the position of another participant)
    (e. exists independently of the event named by the verb.)
    
    (Dowty, 1991: 572)

I shall look for elements that this list has in common with other systems. I shall ignore item e. as Dowty says himself that he does not know whether it properly belongs in the system or not. The item d., movement, looks akin to Langacker’s figure and ground, but we know that Dowty eschews the “perspective on a scene” approach as not belonging in the realm of linguistic semantics. However, an alternative way of interpreting d. is that it says that a proto-agent is typically a theme. This fact begs the question of whether Dowty’s localism has much in common with Jackendoff’s and Pinker’s given that he eschews Jackendoff’s localist account which is structured in terms of an analysis of prepositions. Dowty’s c. is exactly similar to Talmy’s (1985b, 1988) agonist, the participant who is the instigator of some action and who provides a force source which the antagonist opposes. Jackendoff (1990:128) in an account of prototypical agency notes that “[o]ne sense of Agent, ‘extrinsic instigator of action,’ is captured by the role ‘first argument of CAUSE,’ an element in the thematic tier.” This definition looks akin to Dowty’s c.
Dowty's criterion b. appears rather more complicated. It belongs with the idea of a great chain of being, and implies that Dowty believes that linking to subject is in line with an animacy hierarchy. Nothing of this kind appears in any of the other accounts under review. There has been work on subject selection which suggests that animacy, and particularly the property of being human, are important for being a subject, but animacy need not be particularly associated with agency. There are two reasons why: first, non-human participants in a situation may be highly agentive, as in *the knife cut the cake*; secondly, human and animate participants may be quite lacking in agency. Human patients abound in English: *Peter in Jane hit Peter* is a patient, and has no agentive qualities at all. Dowty's concern with subject selection, evident in his criterion ii., raises the issue of the relationship between subjecthood and agency.

Volitional involvement, Dowty's first criterion, is similar to my DELIBERATELY test above, and is a standard test for agency. While I think that this test is a good test for an agent, it appears that it is not relevant to subject selection: it is possible to have sentences like (25a-b) where the subject is always the subject, but where there are problems in establishing whether it is an agent or not. However, its agency, or otherwise, is immaterial in grammatical terms.

(25)  
  a. Peter deliberately rolled down the hill for fun  
  b. Peter (*deliberately) rolled down the hill after being bound and gagged

The sentence in (25b) cannot have *deliberately* as an adverb modifying the verb, yet that fact appears not to affect *Peter's* status as subject, although his status as an agent is very different in the two sentences.

The facts about sentience and volitional involvement indicate that it is essential to factor out the differences between agency and subject selection. I suspect that there is some confusion of the two in Dowty's identification of proto-agents, because his proto-agent is the argument which is most likely to map onto the subject. He expressly states that of all the domains which semantic relations might be seen to work in, the one which he intends to examine is that of argument selection (1991: 561). As a consequence, he has a range of features, some of which are pertinent to subject
selection, others of which are clearly related to a definition of agent. The task at this point is to work out what it is that establishes agents, as opposed to other participants in a situation. What are the semantic features that Dowty, and the other authors, identify as being the most appropriate means for identifying semantic roles? Because Dowty’s approach is structured around the idea of cluster concepts it is possible that some of what he claims to be relevant to the identification of an agent will actually apply to other participant roles, as well as to subject selection.

At least two of Dowty’s factors are shared by the other authors reviewed. These are localism and force-dynamics. We shall ignore the other two factors that Dowty suggests, volition and animacy, although they may become relevant in later discussion. I discuss localism and force-dynamics in the next section. Dowty’s model is discussed further in 4.4.4.

1.2.7 Localism and force-dynamics

In this section, I am not concerned with the problems of argument selection, but rather what the content of a particular semantic relation might be. I take the position that what Dowty calls “lexical meaning extension across cognitive categories” (1991: 561) is an interesting approach and one that is worth pursuing. Jackendoff (1990: 25) argues that “the formalism for encoding concepts of spatial location and motion, suitably abstracted, can be generalised to many other semantic fields”. This is an interesting claim, but it is one that while intuitively acceptable for some areas of meaning is not necessarily so obvious for others. I wonder how the experience of thought, or of tasting might be analysed in a localist framework, for example.

Lyons (1977: 718-724) points out that the spatialisation of meaning is found not just in prepositions and particles, but also in “verbs, adverbs, adjectives and conjunctions” (1977: 718) and he discusses early claims for human cognition being organised around spatial notions such as Anderson (1971), and Miller and Johnson-Laird (1976). He points out that a localist analysis of aspect, grammatical case, existential and possessive constructions is relatively uncontroversial.

If we take the area of force-dynamics, as discussed in Talmey (1985b, 1988) and Croft (1991), then a very different analysis of semantic relations begins to emerge.
In this model, force oppositions between participants are taken as crucial in identifying semantic classes of verbs; they are central to the analysis of causation, not just as ‘causing’ but also as ‘letting’. Talmy claims (1985b: 293) that force-dynamic patterns are central to the analysis of modality, a claim which is explored and justified by the work of Sweetser (1990). Talmy’s model rests on the assumption that force-dynamic principles extend beyond the physical domain “by metaphorical extension” (1985b: 293) to other domains of psychological and social interaction as, indeed, the analysis of modality would imply. Effectively, the claim for force-dynamics is the same as that for localism, but located in a different area of meaning.

What is suggestive about these models is that they can be extended to domains other than those in which they first became obvious. For both Jackendoff and Talmy, one area of meaning provides a conceptual basis for other areas of semantics. The two systems are not exclusive: Jackendoff (1990) attempts to locate a number of insights from force-dynamics within his model of conceptual structure. Talmy (1985a) also uses localist ideas, so in fact both systems rest on the idea that it is possible to account for meaning in terms of two simple systems.

Another analyst who draws on force-dynamics and localism is Pinker. His (1989) model attempts to establish an inventory of components of verb meaning, drawing extensively on Talmy’s (1985a) inventory. However, I shall not present a more detailed account of Pinker’s model of semantic structure: it is very similar to Jackendoff’s and the differences between Pinker and Jackendoff are due to Pinker’s primary concern being with learnability.

The chief difference between the systems of Talmy and Jackendoff is that in Jackendoff’s model, the different semantic relations are analysed in terms of the predicate that they are arguments of, whereas in Talmy’s model, the antagonist and agonist are primitives of the system. Talmy’s relations are reanalysed in Jackendoff into arguments of semantic situation types.

The reason why I have concentrated on localism and force-dynamics is that I show below the extent to which my verbs can be dealt with in localist and force-dynamic terms, and which areas of their meaning cannot be handled in these terms.
It is also necessary to consider whether additional elements are needed to capture all of the possibilities of verbal meaning. For example, given the number of models of semantic relations which draw on aktionsarts, I am interested in finding out whether aktionsarts need be semantic primitives. In particular, in the light of Lyons' (1977) comments referred to above, I should like to establish whether aktionsarts can be analysed in terms of force-dynamics and localism either together or separately.

One reason for examining the relationship between force-dynamics, localism and aktionsarts is that some authors, such as Levin and Rappaport Hovav (1991), argue that aktionsarts are semantically primitive in the decomposition of different verb types. In their (1989) analysis of unaccusativity, they take Rosen (1984) to task for her analysis of Italian unaccusativity, claiming that she has ignored vital evidence from aktionsarts. While their observations may be quite right, it would be interesting to see whether there is any need to refer to aktionsarts at all, or whether, in fact, with a joint system of localist semantic relations and force-dynamics, aktionsarts are simply by-products of a verb's wider semantics. Jackendoff (1990: 28-30) discusses some factors that participate in the analysis of aktionsarts and Jackendoff (1991) demonstrates that it is possible to account for certain aktionsartal phenomena by elaborating on the account of boundedness and allowing it to apply to situations as well as to things (as in count and non-count nouns).

In the following, I analyse aktionsarts in terms of semantic role types, and force-dynamic participants.

The simplest presentation of aktionsarts for this purpose is that in Vendler (1967). For the purposes of this discussion I use Brinton's binary-feature analysis of Vendler's classification of aktionsarts. It includes the following set of oppositions: +/- stative; +/- durative; +/- telic; +/- voluntary (Brinton, 1988: 28). I shall leave the final feature for now, and discuss the other three in turn.

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15 The following account could be an analysis of the aktionsart types discussed by Dowty (1979), Kenny (1963), Mourelatos (1981), or of the binary feature analysis of Comrie (1976). It is merely intended to be exemplary.

16 The +/- voluntary feature is difficult to account for, and it is hard to see where it fits in a semantic analysis. It does not appear to be central to an analysis of agency, in that items can be fully agentive without having the ability to participate in a situation voluntarily or not. Jackendoff (1990: 128ff) treats it as a feature elaboration on the participant who is the first argument of the function ACT. Such an approach seems to me to be indicative of the nature...
The converse of +/- stative is +/- dynamic. Dynamicity is clearly a force-dynamic notion. It involves the effort of a participant in the situation type, so for example, in (26) the subject of the verb is seen as the instigator of the action and also as the source of the energy which is required to maintain the action.

(26) Jane was running

Any non-state requires a degree of energy input, and force-dynamics offers a means of characterising this. We can characterise Jane as a participant in an event where her natural tendency is towards rest: running is an activity which is subject to real physical constraints and it is not possible to run indefinitely. On the other hand, a state may be force-dynamically neutral, or there may be no force-dynamic opposition at all. "To remain in a state requires no effort, whereas to remain in a dynamic situation does require effort" (Comrie, 1976: 49). (27) is an example of a state; it is not possible to determine whether either participant in the situation of 'liking' is more or less responsible than the other for the situation.

(27) Peter likes chocolate

It is possible to characterise a situation like that in (27) in two different ways: either there is no force-dynamic opposition at all, or there is one, but it is in a steady state, and Peter and chocolate are equally responsible for the situation. Either we have to decide that all non-dynamic situations are not amenable to a force-dynamic approach, or we can subclassify states into those that show no force-dynamic opposition, and those that show some kind of steady-state force-dynamic opposition. Atheoretically, it may appear to make no odds which position is adopted. I return to this issue when I examine the aktionsart of SEE in Chapter 3. In an event, one of the participants, typically the agonist, is overcoming the antagonist’s natural resistance to force.

of voluntariness: it is not necessary for agency, but it is stereotypically associated with agency. Consequently analysts of semantics have difficulty in knowing what to do with it. I discuss how voluntariness can be accounted for in Chapter 3. +/-Voluntary is also one of Dowty’s (1991) proto-agent features.
The second binary feature, that of +/-duration, can be accounted for in localist terms. Events can have duration; states are always durative. Duration can apply to space as well as time: if we look at the meaning of FOR in (28), we can see that it can have spatial and temporal meaning; in both cases, the domain of meaning is duration.

(28)  

a. the road goes north for a long way  
b. the journey lasted for a long time

The converse of a durative situation is a punctual one. We can see that a punctual event is like a place which is a dot: it is bounded in all dimensions, and interacts most notably with the semantics of countability.

For an event to be punctual, it must be countable. If an event is countable, then it is iterable. If it is iterable, then it can occur in the present progressive. Countability in events is like countability in nouns. To be countable, the event has to have boundaries. This is comparable to the situation with nouns: the referent of a noun has to have boundaries if the noun is to be countable. Certain situation types resemble mass nouns, others resemble count nouns. Punctual situations resemble count nouns. Durative situations may resemble mass nouns: the durativity of states is linked to their unboundedness. Any situation type requiring energy input is potentially bounded, so all events are like count nouns. In localist terms, a punctual event is like a place, whereas a durative one is like a path.

The picture becomes clearer if we look at telicity. Telicity is boundedness in one dimension; it typically includes a goal or a traversed boundary. A telic situation is one that is bounded, although it has some kind of duration. Running home or dying are both telic: they each have an endpoint. This is accountable for in localist terms: a telic situation is one that involves a goal, or another similar endpoint to a path. It is not necessary for a telic situation to be countable: it is only possible to die once, but dying is quite categorically telic. The difference between a punctual and an ordinarily telic situation is that the punctual situation is countable and, perhaps more tellingly, the punctual situation consists of its endpoint. That is, a punctual situation ends as it begins.
The strong claim is that between them localism and force-dynamics can account for a large number of issues in verbal semantics. This claim has been tested in the area of aktionsarts, and the results have been highly suggestive. Consequently, I adopt a joint force-dynamic/localist representation of semantic structure on the assumption that aktionsart-based accounts are inappropriate given that aktionsarts can be reduced to force-dynamics and localism. However, my assumption of these two models does not presuppose their adequacy for the whole of the project in hand; I may need to address some of the other elements that Talmy (1985a) and Pinker (1989) have recourse to in their analyses of the semantic content of various verb classes. I explore at least one problem for a joint localist/force-dynamic account in the next section.

1.2.8 The status of the semantic role called experiencer

The discussion in 1.2.7 raises doubts about the status of the semantic relation experiencer. Jackendoff specifically excludes such a role from his account, and states that “the role standardly called Experiencer is treated here as a Location or Goal on the thematic tier: the Experiencer is the location of the fear, pleasure, and so forth.” (1990: 262). He then claims that differences between PLEASE-class verbs and LIKE-class verbs, which have experiencer arguments that have different syntactic realisations, can be accounted for in terms of the action tier. That is, these verbs have, in Jackendoff’s account, exactly the same thematic structure.

This analysis raises two problems: the first is that Jackendoff (1983, 1990) does not explain how location is defined, except in terms of particular prepositions (which do not play a part in the structures of PLEASE or LIKE); the second is that Jackendoff does not make clear where in the meaning of PLEASE and LIKE a location would be structured.

If the experiencer is the location of an experience, what is the location of experiencing a HEAR-class verb? There is some reason to believe that the verbs of perception are in some odd way verbs of motion: there is the evidence in Gruber (1967), and in examples like (29).

(29) a. I can see from UCL to SOAS
b. I looked from UCL to SOAS

In both examples in (29), *from UCL to SOAS* is a path: it indicates the beginning point of my gaze, and its endpoint. There is some kind of theme, my gaze, which is capable of the journey. The examples in (29) are analogous to the one in (30a):

(30)  
   a. Jane spat into the fire  
   b. St. Joan spat in the fire

In (30a), the action takes place outside of the fire, there is a theme, Jane’s spittle, which traverses the path from Jane’s mouth into the fire. In (30b), St. Joan is already resident in the fire, so the sentence is ambiguous: it could either be intended to indicate that St. Joan’s location was the fire when she spat, or it could be intended to suggest that there is a theme, just as in example (30a). There is an equivalence between the examples in (29) and the one in (30a). While it is uncertain what the theme of perception might be, it is very clear that there is something which is moving. I show in Chapter 3 that the theme of ‘seeing’ is the gaze.

(31) shows that there is not a theme for HEAR, or the other verbs in the HEAR-class, which is the same as the theme of ‘seeing’.

(31)  
   a. ?I can hear from her seat to the stage.  
   b. !I can feel tingling from my fingers to my wrist  
   c. !I can smell dinner from the kitchen to the dining room  
   d. !I taste the spices in the soup from here, even before it’s in my mouth

The sentences in (31) are all odd. There are different reasons. Some verbs of perception, FEEL and TASTE, typically require contact. Therefore it is unusual for them to occur in a context like (31). If contact is required, a theme is very unlikely. It is possible that the *tingling* in (31b) is a theme, and that it is acceptable for FEEL to be a verb of motion of some kind when it is a verb of bodily sensation (in Leech’s 1987 terms), it is hard for FEEL to indicate motion in other circumstances, although
sentences like *I can feel the heat of the fire from here* suggest that it is possible for FEEL to have a theme, even when it is not a verb of bodily sensation, but rather refers to a sensation with a stimulus external to the body. In the *heat of the fire* case, the stimulus is the fire, which is beyond the body.

However, there is a very clear problem emerging: if these are verbs of motion, or at least verbs which have some kind of theme, and are therefore analysable in terms of a localist account, how come the theme is not the subject? If we look at Jackendoff’s thematic hierarchy (1990: 268), we can see that he suggests that linking is arranged in the following fashion: first link the actor, next the patient, and next the theme to subject. If there is no force-dynamic opposition present in HEAR-class verbs, the highest participant on the list is the theme. But the theme of HEAR-class verbs is syntactically unstated, just as the theme of SPIT in the examples in (30) is not stated. In (30), it does not matter: there is an actor, who is the instigator of the action and who is responsible for it, so that it is the actor that is linked to subject. Given that Jackendoff claims that the experiencer is a location, and given that he claims that the location is never linked to the subject, and given that there is no higher semantic role of HEAR-class verbs, in terms of Jackendoff’s thematic hierarchy, how come the experiencer of HEAR-class verbs is linked to their subject?

Can it be true that the experiencer is a kind of location? What sort of location is it? If we imagine a situation where it is possible to see into something, such as a fire, what is the location in *Jane saw into the fire*? *Into* again indicates that there is a theme, but it indicates that it goes towards a location, away from the subject. The subject does not constitute a particular location in contradistinction to *the fire*. *The fire* is a landmark, or reference object: it tells us where the theme ends; but what is the subject? It is some kind of source, possibly, but it is an uncanonical source because nothing concrete actually leaves it.

Furthermore, the idea that the subject of a verb of perception should be a location, which is probably the source, is counter-intuitive in at least one important respect. The reason why it is intuitively satisfactory to call HEAR-class verbs verbs whose subject is an experiencer is that the subject is perceived as experiencing some kind of sensation: with SEE, the sensation is some kind of visual impression; with
HEAR it is some kind of auditory one. In both these cases, there is a mental processing of sensory data. With FEEL the sensation is closely bound with the physical impression which is involved with feeling, because, I assume, feeling typically involves some kind of contact. On the other hand, with FEEL, SMELL, and TASTE the sensation is located at the sensory organ, so it is more plausible to suggest that the experiencer is some kind of location here than it would be in the SEE and HEAR cases.

Perhaps it is too literal to suggest that for a localist account of verbs of perception to be plausible they have to have some kind of motion inherent in their make up. I do not think that this is in fact the case. First, it is clear that there is something of a localist element to the meaning of SEE. Secondly, it is clearly possible for the subjects of FEEL, SMELL and TASTE to be interpreted as locations. It is not clear how the difference between HEAR-class verbs and other verbs that are more obviously verbs of motion could be captured as a field difference. If Jackendoff's possessional, circumstantial, and spatial fields can all be captured using the same conceptual machinery (1990: 25-26) then it should be possible to account for verbs of perception by recognising a parallel structure to the spatial field, which can be analysed in the same terms. But at least on the evidence reviewed so far, it looks as though such an account is not possible.

We see in Chapters 3 and 5 that different approaches to the nature of the experiencer relation are necessary because it behaves differently depending on the nature of the verb. In the case of HEAR-class verbs, it becomes possible, according to the analysis presented in Chapter 3, to identify the location of the experience as the experiencer. But in the case of SOUND-class verbs, experiencers are force-dynamic participants. Schlesinger (1992) claims that experiencers belong in an agent prototype, because they have a semantic feature that he calls "control". The problems I have shown to exist in the localist account of experiencers inhere to Jackendoff's formulation rather than the notion that experiencers can be locations. However, it should be noted that, on the view that I put forward in this thesis, experiencer is not a single unified semantic relation.
1.2.9 Do we need (Predicate) Argument Structure?

Levin and Rappaport Hovav in a number of papers (notably Levin and Rappaport 1986, 1988, Rappaport and Levin 1988) argue that there is no need to make mention of individual semantic roles because in rules of derivational morphology, like adjectival passive formation, or -er nominalisation formation, and in diathetic cases like the SPRAY-LOAD transitivity alternation, it is possible to come up with the appropriate generalisations by having recourse to a level intermediate between semantics and syntax, called Predicate Argument Structure.

Grimshaw (1990) discusses a level of Argument Structure which she claims exists between “lexical semantic structure” and “deep structure” (1990: 1). Her level of “lexical semantic structure” is equivalent to Levin and Rappaport Hovav’s “lexical conceptual structure”. It means word-meaning. Grimshaw’s “deep structure” is equivalent to “d-structure” in Chomsky’s (1981) Government and Binding theory.

In both theories, Argument Structure accounts for facts to do with nominalisation, and passivisation. The chief difference between Levin and Rappaport Hovav and Grimshaw is that Grimshaw claims that Argument Structure is organised hierarchically, so that the identification of the external argument is not stipulated, as it has to be in other theories, but it emerges from a consideration of the properties that external arguments have as a matter of course.

For Levin and Rappaport Hovav it is necessary to identify the following in an argument structure representation: the external argument, the direct internal argument, and any other internal argument. For Grimshaw, Argument Structure is a list of argument variables, with the variables listed within a series of brackets which are intended to indicate how and when they should be attached to the verb. The external argument is the argument to the left of the list, and it is the most “prominent” argument in terms of Grimshaw’s prominence theory. These items or entities are akin to two different things in other theories.

If we compare the theory of argument structure to Head-driven Phrase Structure Grammar (Pollard and Sag 1994), then it is arguable that it looks like a “subcat” list. The external argument is the subject argument, the direct internal argument is the direct object, and the indirect internal argument is any other argument
of a verb that has more than two valencies. On this view, argument structure is a device for being able to refer to syntactic relata of the verb, without having to refer to their position in a phrase marker. This view of a subcat list is equivalent to a valency list in a dependency grammar.

If, on the other hand, we view Argument Structure as a semantic entity, then it is not exactly like a valency list, but rather it is like an ordered list in a predicate calculus account of a verb's valency. In this light, it is a way of mapping semantic information onto syntactic information (specifically d-structure positions in a phrase marker) or it could be the part of semantics, or conceptual structure, which is “visible” to syntax.

In Grimshaw’s theory, argument structure could be construed as being both syntactic and semantic in varying degrees: by Grimshaw’s own account it is a means of arriving at a syntactic list of arguments from semantic information: the semantic information involved is thematic information, in Jackendoff’s sense, and aspectual information. These two factors build a “structured representation” (1990: 3) which establishes which argument of the verb will become the external argument and which will become the direct internal argument. In this light, Grimshaw’s argument structure is about the relation between syntactic valency and semantic valency. It is either a means of predicting syntactic valency from semantics or a means of linking syntax and semantics. In the light of the discussion in 1.2.6 above, where I argued that aktionsarts are analysable in terms of localist and force-dynamic information, coupled with a notion of countability, we might also wonder whether a theory of argument structure that rests on the aspectual character of a verb as part of how it identifies particular participants in a situation would be better recast in force-dynamic terms. Certainly, the causal analysis that Grimshaw recommends (1990: 24), with its suggestion of Jackendovian tiers, looks akin to a force-dynamic account of linking.

In its formalisation, Grimshaw’s Argument Structure does not have a lot in common with Levin and Rappaport Hovav’s Predicate Argument Structure. On the other hand, in terms of its general status as a device for accounting for phenomena like nominalisation, passivisation, light verb constructions and anaphora, it has a lot in common. Levin and Rappaport Hovav’s claim has consistently been that you do not
need to make reference to the content of an individual semantic relation in accounting
for adjectival passive formation (1986), or -er nominalisation formation (1988;
Rappaport Hovav and Levin 1992), for example, all that is needed is to make
reference to a position in Predicate Argument Structure.\textsuperscript{17} Therefore, instead of
stating that passive involves the demotion of the agent argument, you can say that it
involves demotion of the external argument.

Why should a level of Argument Structure be necessary? It appears that one
reason why use is made of this concept is that semantic relations are dependency
relations whereas, in a lot of theories, syntactic relations are derived from a phrase
marker. If it is necessary to refer to the subject of a verb, before the subject has been
instantiated, at d-structure or wherever else in the derivation it might happen, then it is
quite impossible to make such a reference because there is no appropriate element to
refer to. A level of Argument Structure on this account looks most like a valency list,
or HPSG subcat list. It is a list of the syntactic arguments that a head may take, and
any rules that apply to it are syntactic rules. Grimshaw, despite deriving her argument
structure from semantic information, claims that it is a syntactic level of
representation. On this account, it is a valency list which is derived from semantic
information: Grimshaw's theory makes interesting predictions, which she might well
not want to make: the first is that syntactic information needs dependencies, in the
shape of valency information, as well as phrase-structure. The second is that syntax is
predictable from semantics. Jackendoff's linking rules make no mention of Argument
Structure, doubtless because the semantic structure that he devises is organised in
phrase-structure terms. Consequently, it is possible to map directly from conceptual
structure to syntactic structure.

If there were no phrase structure, would Argument Structure be necessary? I
suppose that the answer to this question is one that depends in large measure on
theory-internal factors. In the course of this thesis, I assume that a relational account
of both syntax and semantics, where both dependencies in syntax and relations in

\textsuperscript{17} This contrasts with the claim in Levin and Rappaport Hovav (1991) which states that to
account for the transitivity alternations of CLEAR-WIPE verbs it is necessary to use a more
fine grained semantic analysis than a semantic role account can traditionally provide.
semantics are organised in terms of prototypes, obviates the need for Argument Structures.

1.3 The theoretical model.
In the next two subsections I sketch the relevant features of Word Grammar.

1.3.1 Syntax and complementation
In Word Grammar, syntactic relations between words are dependencies; one word is the head, which can be identified according to a range of features such as those outlined in Hudson (1990: 106; 1993), and the other word is its dependent. WG makes no reference to phrases, such as those defined in terms of phrase markers, neither does it make any reference to syntactic units smaller than words.

I shall ignore most of syntax for the simple reason that this thesis is only concerned with what a word strictly subcategorises for, and its subject. How WG treats extraction, extraposition, word-order, and so forth, is of no relevance here. WG takes subjects to be direct dependents of the verb as well as objects.

Apart from subjects, the dependency types that we are concerned with are complements, which we shall subclassify below, and adjuncts, because the semantic relation between adjuncts and their heads could be important in the analysis of the semantics of perception verbs that follows.

The complement types recognised in Hudson (1990) are object, indirect-object, particle, oblique, adjunct-complement and incomplement. There is a discussion in Hudson (1990: 233-239) which I shall summarise here.

Object. Objects are nouns, are typically passivisable, and are usually nearer the verb than any other complement.

Indirect-object. These occur with, and before, another (ordinary) object. The head of indirect objects has at least two and only two objects, one of which is an indirect object. The semantic relation expressed by an indirect object is typically one of actual or potential possession.
Particle. Examples like *up* in *Peter rang Jane up*. They may occur before or after the object, but always after an indirect object.

Oblique. A preposition which is selected by the verb

Adjunct-complement. A complement which is selected by the verb, but which is exactly like an adjunct in all respects except its having been so selected. A typical example is the place expression after PUT in an example like *Peter put the biscuits in the tin*.

Incomplement. An incomplement is the complement which is incomplete because it needs a subject itself. Typical examples include the infinitive clauses after PROMISE and SEEM in sentences like *Jane promised to go home* and *Peter seemed to like syntax*. I shall refer to incomplements as “xcomps” in the rest of this thesis. They are exactly similar to xcomps in LFG (Bresnan, 1982).

This ends our survey of the syntax that we need: further clarification of these categories and how they can be identified will be presented in Chapter 2 as the constructions which these verbs can enter into are set out in full.

1.3.2 Semantics

I have already laid out a number of the semantic preoccupations which this thesis is concerned with. Here, I shall sketch out the model that I intend to develop in the course of the work, and to identify how I intend to set out what the relevant factors are.

In WG, semantics is viewed as being a large conceptual network, which consists of nodes that are connected by a number of relations. The most important of these is the “isa” relation. This relation is an inclusive one where one node is an instance of a superordinate category. The notion is complex in that it includes a number of possible situations. The most common one involves the classification of concepts into taxonomies, for example the classification of dogs as mammals. Here, we see that the concept ‘dog’ inherits the properties of the concept ‘mammal’ as well as supplying its own more specific properties. Inheritance is a transitive relation in that it is possible for the concept ‘dog’ to serve as a model for a category of which ‘terrier’ might be the instance. In this case, ‘terrier’ would inherit the properties of
‘dog’ from the model of ‘dog’, including the properties that ‘dog’ inherited from ‘mammal’, and would add yet more specific properties to the sense of ‘terrier’ so that it was distinguished from the more general category.

As a principle of organising information, inheritance is not just used for concept names in WG; it also applies to all knowledge, in line with the theory’s claim that linguistic knowledge is simply a task-specific version of general human cognition. Therefore, not only word meanings are organised in terms of models, instances and inheritance hierarchies. Other knowledge about language is organised in the same way: nouns are instances of words; pronouns are instances of nouns. When applied to other aspects of knowledge, inheritance is transitive also.

Inheritance works in at least one other important domain: the difference between a sense and a referent. All words in WG have a sense: the sense is what the word means, or what its entry in the mental dictionary will be. It is the relations between senses that concern us here: why are LOOK/A and LOOK/P related; how are they so? But in semantics there are other issues of equal importance and we shall have to think about these too. In WG, every word has a referent. The referent is a mental construct rather than a real world entity and, just as with ‘dog’ and ‘mammal’, the referent is an instance of the sense, which supplies the model. (As I stated in footnote 1, by convention in this thesis single quotes indicate that I am discussing a meaning—a sense or a referent.) Furthermore, the sense is not just a fixed entity, which corresponds to the mental dictionary entry. We also have to recognise sub-senses which are hyponyms of the sense of a word. These consist of the sense of the word, modified by its dependents.

We need to recognise a difference between the stored senses of lexemes and the senses of words which are instances of the stored senses. This spells out a suggestion made in Hudson (1990), which claims that there is a difference between stored meaning, the meaning that is always associated with a lexeme, and meaning that is built up online, as we construct the environment that a word occurs in, by looking at its relations to its head and dependents.

Another important concept that we shall work with is that of lexeme. In WG, a lexeme is an abstraction away from a word. A word is what happens in an utterance,
its lexeme is the mental entity of which an utterance-word is an instance. As with other issues discussed in this section, the relation between a word and a lexeme is a model-instance one: the word is an instance of the lexeme. The lexeme is a useful collection of facts with a tripartite structure. As in other theories, it has to include at least the phonological representation of the instantiated word; its meaning; and its syntax. A minimum specification of the syntax is the word-class that the lexeme belongs to, a more explicit body of information includes subcategorisation facts, and the kind of word that can be the head of the item under consideration. Syntactic information is also inherited in an isa hierarchy. Hudson (1990) Chapter 3 provides a full discussion of inheritance in WG.

In the context of this thesis, we might wonder how WG distinguishes between lexemes, and how we can decide whether the words in Table 1 belong to different lexemes or not. The assumption is that there is more than one lexeme if either the syntactic information or the phonetic information differs, but not if the semantic information differs: this allows for polysemy, and draws a distinction between polysemy and homonymy, in that it states that words are homonyms only if they have the same phonetic representations. This assumption is different from a number of others, such as Cruse (1986: 51), in that it states that BANK (a place for keeping money) and BANK (a bit of ground constituting the side of a river) belong to the same lexeme, and so exhibit polysemy rather than homonymy. The relatedness of senses, and the possibility of predicting one sense from another are handled by having relations between senses, rather than positing different lexemes for senses that have no relation. This account allows a great deal of flexibility when looking at phenomena such as the sharing of a sense by different lexemes. The theory claims that each word in each of the columns of Table 1 belongs to a different lexeme but in the case of the polysemy of SEE, for example, there is only one lexeme because each of the different senses of SEE has the same syntactic information, and phonetic form.

The nature of semantic relations, or semantic roles, is consequently important in WG as we saw in the discussion of the polysemy of SEE in section 1.2.3 above. We should look at the kind of semantic relation that is available, and how we expect to use it, especially in the light of the discussion of semantic relations and Predicate
Argument Structure above. WG is unlike semantic accounts where semantic structure is handled in terms of hyponymy, meronymy, antonymy and similar notions into a structural account of a vocabulary as, for example, in Cruse (1986) and Lyons (1963).

We have already explored some of the semantic role systems that are available: there are systems based on localism, force-dynamics, aktionsarts, and so forth for semantic roles, and there are other systems such as Talmy’s (1985a) which include manner and purpose as semantic elements that have to be considered in the account of a word-meaning. My claim here is that semantic relations operate at a level of generality so that if the sense of a verb isa some kind of ‘moving’, then the first argument of the ‘moving’ will be a theme. The kind of semantic relation that is necessary in the analysis of a verb includes the isa relation, a relation “er” which is an ad hoc relation in Hudson (1990), but here is taken to be a prototypical relation, a relation “ee” which is another prototypical semantic relation, and other arguments such as “purpose” and “result”.

On the account being worked out here, there are no individual semantic role types, such as theme, or agent. Rather, each semantic role type is inherited by the definition of the verb from the model of which it is an instance. We can see er and ee as very general semantic role types which generalise over all situation types. Consequently, as syntax and semantics both operate in terms of dependencies, we should expect there to be no need for a predicate argument structure. The correspondence between semantics and syntax is statable in terms of er and ee.

Er and ee capture another important set of generalisations, too. As WG does not have phrase markers, it may appear quite hard to capture cross-categorial generalities across nouns and verbs in terms of possible argument taking properties. As we noted in the previous section, there are many different complement types; however, none of them, apart from the generalisation complement appears to be appropriate in the analysis of nouns. Furthermore, nouns have arguments, both in the sense that they have participants in the situations which comprise their senses if they have a situation type rather than a thing as their sense, and in the sense that they can have complements, such as the preposition OF. WG predicts that these are two different phenomena, and that they should be captured in terms of separate
generalisations: the participant sort of argument is accountable for in terms of ers and ees. The other kind of argument is merely one of a range of complement types.

The use of general terms like er and ee raises another potential problem: with only two argument types, how can senses which appear to involve more than two participants be accounted for? I make no claim that er and ee are the only argument types that are needed: in fact I make precisely the opposite claim, that other more specific role types, such as result, will almost certainly be needed. Furthermore, in Chapter 3, I make the claim that the prototypes that make up er and ee need at times to be unpacked so that the different elements of er and ee can be linked to different syntactic entities. This strategy is used to some advantage in Chapters 4 and 5. Two points emerge, some semantic relations are defined in terms of the situation type that they are the er or the ee of; others, particularly the force-dynamic kind, define their situations. We shall see that there is a need for both kinds of semantic role.

In not using a traditional inventory of semantic roles as primitives, I am following Jackendoff (1983, 1987, 1990) and Pinker (1989). In having semantic roles as prototypes, I am following the spirit of Dowty (1991), and in stressing the importance of force-dynamic relations, I am following Croft (1991) and Talmy (1985b, 1988).

In the chapters that follow, a lot of information is presented in diagrammatic form. The diagrams follow the conventions established in Hudson (1995a).
Chapter 2
Complementation and syntax

2.1 Introduction
In this Chapter, I outline the range of constructions that the verbs in Table 1 of
Chapter 1 can occur in, and describe their syntax. In addition, there are some relevant
semantic matters which I discuss. Complementation is important in lexical semantics,
and we shall be looking at a number of constructions so that we can determine the
status of the different words in each construction. I begin with LISTEN-class verbs,
and I then deal with each of the classes in turn. Some sections are longer than others
because the complementation of some of the verbs, SEE for example, is more
problematic than that of the others.

2.2 LISTEN-class verbs
In Chapter 1, we saw that these verbs all have agentive subjects. The progressive and
the manner adverbs are useful diagnostics of agentivity. It is also possible for some of
them, FEEL/A, SMELL/A, and TASTE/A, to have direct objects, as in (1).

(1) a. Jane was dextrously feeling the fabrics
   b. Jane was carefully smelling the food
   c. Jane was indulgently tasting the new wine

It is not possible for LOOK/A and LISTEN to have direct objects, however:

(2) a. *Jane was looking the picture
   b. *Jane was listening the music

Instead, LOOK/A regularly collocates with AT, and LISTEN regularly collocates with
TO. For these verbs, it is important to determine whether the preposition with which
they regularly occur is an adjunct or a complement, and whether the complement of
the preposition is the percept. Both adjuncts and complements are semantically
revealing about the words that they occur with, but in different ways. Complements fill semantic roles that are determined by their head. The same word, e.g. *Jane*, can occur as the complement of a number of verbs, and its semantic role will vary according to the semantics of its head. A time adjunct, like *for five minutes*, on the other hand, does not have its semantic role determined by its head. It always fills the same semantic role, namely time. Where it differs from a complement is in its being maximally general and optional. Adjuncts fill semantic roles because of their own meaning. I shall show that AT after *LOOK/A* is an adjunct and that TO after *LISTEN* is a complement and, therefore, the linking of *LOOK/A* and *LISTEN* is very different. We shall look at the semantic consequences of these decisions in Chapter 4.

Interestingly, it is possible for all of the *LISTEN*-class verbs to occur with a purpose infinitival clause, or a purpose FOR-adjunct, either with or without the percept being expressed. Purpose expressions can also co-occur with certain path expressions as in *Jane felt to find out whether she had broken a bone through her trouser leg*. FEEL/A, TASTE/A and SMELL/A can only occur without their objects when they occur with a purpose expression or a path expression as in (3).

(3)  
   a. Jane felt to find out where the lightswitch was  
   b. Jane felt the wall  
   c. Jane felt at the wall

If anything, (3c) is more acceptable than (3a).

In the following sections, we shall look at the prepositions that may occur with the verbs in the *LISTEN*-class, and try to determine what their syntactic relation to the relevant verb is, as well as suggesting what these collocations might tell us about the verbs’ semantics.

### 2.2.1 LOOK/A

AT is a spatial preposition. Some other spatial prepositions that can occur with *LOOK/A* are INTO, IN, ON, THROUGH, and UNDER. In these cases, the preposition and its complement indicate the path of the gaze.
(4) a. Peter looked into the biscuit tin  
b. Peter looked through the glass ball  
c. Peter looked under the table  

In the case of IN it appears that the adjunct modifies the whole action, in that it specifies the location of the action, and therefore that of the subject, rather than that of the percept:

(5) Peter looked in the room  

However, if, in an example like (5), the viewer and the percept are in different places, \textit{in the room} cannot be the place of the viewer.

(6) a. *I looked at the garden in the sitting room  
b. *I watched the garden in the sitting room  

Here, FROM is obligatory. IN tells you the location of the subject and the action together. One thing that is potentially confusing about IN is that it can also be used in situations where there can be no element of subject modification, as in \textit{Peter looked in the cupboard}. With the examples in (4), there is an ambiguity. Not only can these prepositions indicate the final location of the subject’s gaze, but they can also describe the path of the gaze, with its destination, or the percept, at some point at the end of a path described by the preposition. The same is true of IN which is polysemous with both a place and a path sense. The path sense is the same as the sense for INTO. The potential ambiguity is easiest to see if the ambiguous preposition occurs in a sequence with AT:

(7) a. Jane looked into the biscuit tin, at the crumb in its corner  
b. Jane looked through the window, at the activity in the room  
c. Jane looked under the table at the dog who was on the other side
d. Jane looked in the room at the painting on the wall

In a sentence like (7d), the sense of IN is the same as that of INTO, rather than being the same as the sense of IN in (5). It is this polysemy that accounts for the absence of subject modification in an example like Peter looked in the cupboard. The ambiguity is exactly similar to the one described by Jackendoff (1990) where exactly these prepositions occur with a verb of motion:

(8) The mouse ran under the table

(8) could either tell us the mouse’s destination, or a path it took on the way to its destination. The same is true of the examples in (7).

The significance of these directional prepositions rests in their syntactic relation to the verbs of the LISTEN-class, and how many of these verbs they may occur with. It is also important to note whether the syntactic relation between the prepositions in (4) and LOOK/A is the same as that between AT and LOOK/A. Furthermore, I am interested in which of these prepositions can also occur with other verbs in the LISTEN-class. Some of the prepositions may have more general collocational possibilities than others. In the following section, we shall look at the relation between LISTEN and TO as well as LOOK/A and AT, and we shall see which of these directional prepositions can occur with the other verbs in the LISTEN-class. I argue that AT belongs with the other prepositions reviewed here as spatial adjuncts, and that TO is entirely different from AT, specifically because it is a complement so it does not fix its own semantic relation to its head and it does not have a locational or directional meaning. In addition, there is a clear distinction between locational uses of the prepositions and directional ones, which corresponds to different grammatical structures.

The relation between directional words and their heads is an interesting one. Pinker (1989: 182) says “direction phrases, often treated as “adjuncts,” cannot be treated as being independent of argument structure”, by which he means that the ability for the verb to occur with a direction phrase has to be specified in the semantic
entry for that verb. Although I do not subscribe to this view, I am impressed by evidence of Bresnan's that some directional prepositions are complements while others are adjuncts (Bresnan, 1994: 81-83). Bresnan states that LOOK/A does not have a complement, and that the directional phrase that follows it is an adjunct. This observation is interesting because of the typical and regular collocation between LOOK/A and AT. I look first at the syntactic relation between AT and LOOK/A, and then I compare it with the relations between other directional prepositions and LOOK/A.

2.2.2 The relation between LOOK/A & AT and LISTEN & TO

In (9a), AT is not part of the valency requirements of LOOK/A: it is an adjunct. On the other hand, TO is selected by LISTEN and it is a complement. The resulting prediction is that AT has the same semantics that it always has and that it supplies its own meaning, whereas in (9b) TO is bleached of independent meaning and it carries a semantic role determined by its head.18

(9)  a. Jane looked (right) at Peter
    b. Jane listened (*right) to Peter

The data with right show that the prepositions have different sorts of meaning. At can be modified, but to cannot, suggesting that at is contentful here and to is not. These meaning differences are further support for the claim that at in (9a) is an adjunct, and to in (9b) is a complement.

The following criteria are common in determining grammatical relations; I have taken them from Hudson (1990: 202-211). There are other criteria, such as whether word order is fixed or not which are inconclusive in these cases, so I have not used these diagnostics.

18 I do not suggest that being an adjunct means that AT does not provide information about the semantics of its head, merely that adjuncts dictate their own semantic relation to their head whereas complements fill part of the valency requirement of the head.
• **Argument**  Is the dependent an argument of the sense of the head?

• **Obligatoriness**  Adjuncts are only exceptionally obligatory; complements are often obligatory; complements are typically semantically obligatory.

• **Form**  Is the form of the dependent fixed or free?

• **Repeatability**  Is the dependent repeatable?

• **Inversion**  Is locative inversion possible?

• **Anaphoric DO**  Can the dependent depend on anaphoric DO?

2.2.2.1 The argument criterion

The argument criterion is crucial. There are two related sets of facts. First, the semantic role of a complement is stipulated by its head, whereas the semantic role of an adjunct is supplied by the dependent. Secondly, the direction of the argument relation does not necessarily follow the direction of the syntactic dependency. For a complement, the referent of the complement is an argument of the sense of the head. For an adjunct, either the referent or the sense of the head is the er of the adjunct’s meaning. This last option is what Ninio (1993) calls reverse unification. In (10a), the referent of *Peter* is an argument of the sense of *hit*. In (10b), the referent of *dog* is the argument of the sense of *big*.\(^{19}\)

(10)  

a. Jane hit Peter  

b. A big dog

The referent of *Peter* is the patient of the sense of *hit*. The sense of *dog* is the er of ‘big’. A crucial distinction between adjuncts and complements rests on the direction of the argument relation.

The general issue can be couched in other terms: what is the source of the semantic role? Is it the dependent or the head? If we look at the examples in (11) and

\(^{19}\) There is some terminological confusion about the relation between semantic relations and unification with semantic information stated in the head. In a *big dog*, ‘dog’ is the er of ‘big’. However, ‘big’ also brings with it the information that it fixes the size value of ‘dog’. That is, ‘big’ stipulates its own semantic relation to its head, but it still has to collocate with its head. Its head has to have a possible ‘size’ value for the semantic information to unify.
(12) in terms of the source of the semantic relation, we can see that the examples in (11) are adjuncts and those in (12) are complements.

(11)  
   a. Jane looked at Peter  
   b. Jane smiled at Peter  
   c. Jane spat at Peter

(12)  
   a. Jane operated on Peter  
   b. Jane depended on Peter  
   c. Jane insisted on an answer

The examples in (11) all show at Peter in the same semantic role, direction or target, both of which are consistent with AT, therefore AT is the source of the relation. The semantic relation is not set by the verb: in all of these cases a different preposition could have been chosen and that preposition would have determined its own semantic relation to its head. In (12), ON is the only preposition that could have been chosen by these verbs yet the semantic relation is not consistent in all of the cases. The semantic relation is determined by the verb.

The examples in (11) indicate that the referent of AT is not an argument of the sense of LOOK/A. What of TO?

(13)  
   a. Peter listened to the sonata 
   b. Peter went to the bank

In (13a), to does not have the same sense that it has in (13b). In (13b), to is directional and it indicates either where Peter is going, or where the orders are going. It does not indicate where Peter, the sonata or anything else is going in (13a) and it is quite clearly not directional. If anything, the semantic relation is that of listen-ee, and the most straightforward analysis is that to is without independent meaning and that it and the sonata are co-referential. This analysis makes the referent of to an argument of the sense of its head.
This analysis can be refined a little more by thinking about extraction facts.

(14)  a. *where did Peter listen?\(^20\)
    b. where did Peter go?

In these cases, it is clear that the to of (14b) is different from that of (14a). Only the adjunct --the clearly directional example-- can be extracted. There is further evidence:

(15)  a. *to what did Peter listen?
    b. *on what did Peter depend?
    c. to whom did Peter give orders?
    d. at what did Peter look?

The examples in (15) show that the to after listen and depend is different from that after give. It is very different from the preposition after LOOK/A too, as the example in (15d) shows. The prepositions which can be pied-piped are those that are semantically full in that they clearly have directional/locational meaning and they are clearly the source of their semantic relation. Those which cannot be pied-piped are semantically empty and are complements of their heads, not adjuncts. The evidence in (14) and (15) demonstrates that TO is an argument of LISTEN but that AT is not an argument of LOOK/A. This provides clear evidence that AT is an adjunct and TO a complement.

2.2.2.2 The obligatoriness criterion

For both LOOK and LISTEN the following word is optional:

    b. “Listen to the music.” “OK, I’m listening.”

\(^{20}\) These examples are ungrammatical on the reading where where is directional rather than locational.
Prototypically, adjuncts are optional and complements are obligatory so this evidence suggests that the preposition in both cases is an adjunct rather than a complement. But there are some grounds for not assuming optionality to be evidence of adjuncthood in particular. Some objects, like the direct object after EAT, are optional. Optionality is most important in the semantics: the eat-ee is not optional in the semantics of EAT and we understand the verb EAT to mean the mastication and digestion of some entity (by default a meal) even if there is no object for the eat-ee to be linked to.

There is no semantic requirement to express a target with LOOK/A. A direction phrase is common, as the examples in (17a-b) show, but it is not even necessary to express direction as (17c-d) shows.

(17) a. “Look to the left!”
    b. “Look left.”
    c. It was pitch black and Peter looked for a chink of light
    d. Jane looked and looked but she couldn’t see anything

In (17a-b), the addressee is instructed to look in a particular direction, not at a target. In (17c), Peter’s gaze is directed, but again only in a direction, or a series of directions, and not at a target. The examples in (17) show that AT is optional. This provides further evidence that it is an adjunct which clearly does not encode a percept. An optional direction phrase can only describe the orientation of the looker’s gaze.

In the case of LISTEN there appears to be no obligatory element at all. Not only is TO entirely optional in the syntax, it is optional in the semantics too. LISTEN has no requirement for a percept as (18) shows:

(18) Jane listened and listened but she couldn’t hear anything.

We shall see in Chapter 4 that the optionality of the percept runs through all members of the LISTEN-class and that it is due to their having a complex semantic structure. In brief, the sense of each of the LISTEN-class verbs is not an instance of perception
but an instance of an action. The perceptual meaning is embedded under the actional one. Consequently, what appears to be the ee of the sense of FEEL/A is not actually its ee, but the ee of its result. Furthermore, the perceptual element of the meaning of "look" and "listen" is omissible, hence the optionality of TO in examples like (18). There is further exploration and justification of this position in Chapter 4.

2.2.2.3 The form criterion
Words stipulate the form of their complements. The form of adjuncts is potentially unrestricted. So, while some verbs can have common nouns as their complements, no common nouns can, they can only take OF as their complement. When the form of a dependent is free we have evidence that the dependent is an adjunct; if it is not free the dependent is a complement. We can look at the issue of whether the form of their dependent is stipulated, or not, to see how similar LOOK/A and LISTEN are.

(19)  a. Jane looked at the picture
      b. Jane looked into the box
      c. Jane looked over her glasses
      d. Jane looked to find her glasses
      e. Jane looked for hours

LOOK/A is able to occur with a range of adjuncts, including directional, temporal and purposive ones. This evidence suggests that the AT which follows LOOK/A is another directional adjunct and that it has no special status. LISTEN can appear with a similar range of adjuncts as the examples in (20) show. LISTEN does not stipulate the form of all of its dependents.

(20)  a. Peter listened to the sonata
      b. Peter listened under the table
      c. Peter listened through the keyhole
      d. Peter listened for mistakes in his students’ French orals
However, when LISTEN occurs with TO, the percept of listening is expressed as the complement of TO, and so the form of TO is stipulated. This suggests that TO is an optional complement and that its relationship to LISTEN is the same as the relationship between DEPEND and ON.

(21)  
   a. Peter listened to the sonata  
   b. *Peter listened the sonata  
   c. *Peter listened on the sonata

The stipulation of form shown in (21) shows that the TO which occurs after LISTEN is certainly a complement. Neither a noun phrase nor another preposition can be the complement of LISTEN.

2.2.2.4 The iterability criterion

Repeatability is a criterion: adjuncts are repeatable and complements are not. The repeatability of adjuncts is due to the fact that adjuncts have their heads as their ers. Adjuncts build semantic structure; they do not fill a valency slot in the sense of their head. Complements do fill a valency slot in the sense of their head and so complements cannot be iterated: there is only one slot to be filled at any given time. Consequently, the only restrictions on the repeatability of adjuncts are pragmatic. Hence the example in (22a) is fine and the example in (22b) is not.

(22)  
   a. Peter walked to work in the morning in the winter  
   b. !Peter walked to work in the morning in the afternoon

(22b) is incoherent because the two time expressions conflict in the information that they provide.

The examples in (23) show that AT phrases as dependents of LOOK/A can be repeated and that direction phrases as dependents of LOOK/A can be repeated.

(23)  
   a. Peter looked at the picture at the fine detail in the corner
b. Peter looked at the portrait into the eyes of the sitter

c. Peter looked into the drawer at the knives that were kept there

The examples show that the AT after LOOK/A is clearly an adjunct.

With LISTEN the situation is different. A TO-phrase cannot be repeated.

Furthermore, because a TO-phrase is not an adjunct there are no similar phrases that can occur simultaneously with a TO-phrase.

(24)  a. *Jane listened to the band to the music
      b. *Jane listened to the band to the drummer
      c. *Jane listened to the music to the loud passages

There is no way of repeating a TO-phrase complement of LISTEN. Therefore, the unrepeatability of TO in (24c) must be due to the syntactic ban on repeating complements, rather than being due to the semantic restrictions on repeated adjuncts.

2.2.2.5 The inversion criterion

The inversion test is one for locative phrases: such phrases can sometimes invert with the subjects of their verbs. The examples in (25) show that it is not enough that the location can be predicated of the subject of the verb; it is also necessary for the verb to have a meaning involving location or an element to which a location or direction phrase is relevant. The examples in (25) show that without such an element in the meaning of the verb, locative inversion is not possible.

(25)  a. Jane stood in the kitchen
      b. in the kitchen stood Jane
      c. Jane laughed in the garden
      d. *in the garden laughed Jane.
      e. toward the wicked sheriff walked the masked avenger
This diagnostic does not help in distinguishing adjuncts from complements, but it does help establish further that the TO after LISTEN is not directional. LISTEN and LOOK/A do not behave in exactly the same way with these phrases.

(26)  
\begin{itemize}
  \item a. !at the picture looked Peter
  \item b. *to the music listened Peter
\end{itemize}

Neither of these examples is entirely satisfactory, but (26a) is certainly better than (26b). The failure of LOOK/A to undergo locative inversion regularly, coupled with other data leads Bresnan (1994) to conclude that the AT is an adjunct. The point is that for locative inversion to work, the preposition must have a full locational meaning and be a complement.

\subsection*{2.2.2.6 The anaphoric DO criterion}

This diagnostic distinguishes between adjuncts and other dependents. In a slot/filler approach to heads and dependents, a complement fills a slot in the semantic structure of the head, whereas an adjunct provides its own slot. The consequence is that adjuncts can occur as the dependents of anaphoric DO, because they provide their own semantic relation; complements cannot occur as the dependent of anaphoric DO, because they need their head to determine their semantic relation. This test is equivalent to Bresnan’s (1994: 83) SO anaphora diagnostic.

(27)  
\begin{itemize}
  \item a. !Peter looked at the watercolours and Jane did at the oil-paintings
  \item b. *Peter listened to the sonata and Jane did to the concerto
  \item c. Peter and Jane kissed under the mistletoe and Mary and Joseph did next to the manger
\end{itemize}

Both AT and TO present problems as the dependent of anaphoric DO, but for different reasons. The impossibility of TO shows that LISTEN TO is a complement relation. There is however, a general problem in interpreting the example in (27a) in that direction phrases are often hard to get as dependents of anaphoric DO. No direction
adjunct is particularly satisfactory, and direction adjuncts are different in this respect from adjuncts of location, as the examples in (28) show.

(28)  a. ! Peter went to London and Jane did to Edinburgh
 b. ! Jane approached from the left and Peter did from the right
 c. Jane wrote at her desk and Peter did at the table

I am not able to explain what the problem is with some direction adjuncts. There is sufficient evidence from the scalar differences between (27a) and (27b) to identify TO as a complement of LISTEN.

These tests show quite categorically that LOOK/A+AT and LISTEN+TO involve quite different syntax. The weight of the evidence explored through the diagnostics in 2.2.2 shows that the AT depending on LOOK/A is an adjunct and that the TO depending of LISTEN is a complement. Quite clearly, therefore, AT can be replaced by any other directional preposition after LOOK/A with no concomitant change in the meaning of LOOK/A. Equally, AT behaves in precisely the same way that it does with any other verb.

These evaluations raise the question of why it is that two superficially similar verbs, which fit the same paradigm, should have such different syntax. They also raise questions about the semantics of LOOK/A and LISTEN, and how similar we can expect their semantic entries to be. One concern, for example, is why the percept of listening is expressed as an oblique and not as an object. I discuss these issues in Chapter 4.

2.2.3 The relation between LOOK/A and other adjuncts

I am not going to discuss the idiomatic expressions with LOOK/A such as LOOK AFTER and LOOK UP in examples like Peter looked after the baby and Jane looked up the answer. In these cases, the verb+preposition/particle combination forms an idiomatic unit; the analysis of these idioms lies beyond the concerns of this thesis. In this section, I shall look at the way in which LOOK/A relates to other directional
prepositions such as INTO, IN, UNDER, ON, OVER, THROUGH, FOR/purpose, and infinitival TO in a purpose clause.

It may appear unnecessary to find out what adjuncts may occur with a verb, because as my argument criterion in 2.2.2.1 above claimed, adjuncts define their own semantic relation to the verb. On the other hand, it is quite impossible for an adjunct to occur with a verb with which it is semantically incompatible. Adjuncts can be semantically revealing about the verbs that they occur with. Although the semantics of this class of verbs is discussed in full in Chapter 4, we can lay the lineaments of the discussion here. It is also relevant to try to identify the reasons why the AT after LOOK appears to have some resemblance to a complement, even though the evidence reviewed in 2.2.2.1-2.2.2.6 showed it to be adjunct.

We shall treat INTO, IN, UNDER, OVER, and THROUGH as directional (or path) adjuncts first. The first observation is that directional adjuncts have to occur closer to the verb than purpose adjuncts, for example.

(29) a. Peter looked into the room out of interest
    b. !Peter looked out of interest into the room
    c. Peter looked in the room out of interest
    d. !Peter looked out of interest in the room
    e. Peter looked over the fence out of interest
    f. !Peter looked out of interest over the fence
    g. Peter looked through the window out of interest
    h. !Peter looked out of interest through the window

The same is true of locational adjuncts:

(30) a. Peter looked on the shelf out of interest

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21 The is fine as long as IN is assume to have a locative reading rather than a directional one. The directional interpretation requires an analysis of IN where its sense is the same as that of INTO. The unacceptability/ ungrammaticality of this example is only relevant if the directional sense of IN is assumed. The preposition specifies the location of the baby rather than that of Peter.
b. !Peter looked out of interest on the shelf

The examples with the spatial expression nearest to the verb are much more acceptable than those where a purpose expression interposes between the verb and the path expression. One reason for this is that direction and location expressions require there to be a theme in the semantics of their heads. Other adjuncts are not so particular.

The requirement that path expressions occur nearest to their heads is presumably one of the motivations for Pinker's claim that such expressions have to be accounted for in the argument structure of their heads and that they cannot be strict adjuncts. I shall offer a different analysis.

In WG, it is possible to have a steep semantic structure built on a simple syntax. The steepness of the semantics corresponds to semantic bracketing. Therefore, it is possible to state that an adjunct does not modify the sense of a verb or that it modifies the sub-sense which the referent of the event inherits from, but that the adjunct modifies a particular sub-sense of the verb, in this case the sub-sense of the verb which is built up by a combination of the verb and the directional adjunct. The verb builds up sub-senses as it combines with each of its dependents.

As semantic phrasing can account for the scope of modification that we see with directional adjuncts, there is no need to claim, pace Pinker (1989), that directional adjuncts are part of the argument structure of the verb in question. We would, in fact, expect that the reason for directional adjuncts being typically closer to the head than any other adjunct is precisely that they need to be close to the head to form this kind of semantic unit. The ability of directional adjuncts and their heads to form a semantic unit is not a function of the adjunct being part of the conceptual structure of the head, but rather of the way in which the meaning of the sentence is built up. For a word to form a semantic unit with one of its dependents does not make that dependent one of the word's complements.

It is possible for all of the other words in this class to occur with the adjuncts discussed here, with the same restrictions being placed on them.
2.2.4 LOOK/A and AT revisited

If AT is a directional adjunct, and if it need not imply that the gaze has terminated at the percept, why can it not occur with all of the other LISTEN-class verbs? The sentences in (31) should be plausible if there were no oddness about directional phrases with the rest of the LISTEN-class. I have shown that LISTEN does not have a direction-out slot because it cannot collocate with TOWARDS, but it does seem to have a path slot as (32) shows.

(31) a. Jane listened at the music
    b. Jane felt at the fabric
    c. Jane smelt at the food
    d. Jane tasted at the wine

(31a) is peculiar, but (31b-d) are just like the conative alternants of these verbs.
Furthermore, we can see that verbs which may not collocate with AT are fine with a path expression like THROUGH.

(32) a. Jane listened through the keyhole
    b. Jane felt through the fabric
    c. Jane smelt through her gas mask

There are examples with TASTE, but because tasting takes place within the body, it is hard to imagine tasting through a particular thing. It is possible, however, to taste through the barrier of a strong flavour and an example like (33) is fine.

(33) Jane tasted sourness through the overwhelming saltiness.

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22 Tasting at something might seem slightly peculiar at first. It needs some context. *Everyone was tasting at their wine, some people were sipping at it, some people were gulping at it, but nobody was just plain drinking it.* An example like the last sentence is fine.
If it is possible to have a directional adjunct modifying all of the LISTEN-class verbs, why is it not possible for all of these verbs to occur with AT?

At least one potential reason is that AT is regularly able to collocate with verbs of facial expression, such as GRIMACE, SMILE, TURN (ONE'S) NOSE UP, for example, and these verbs of facial expression in turn appear to be a sub-group of a wider group of verbs which can collocate with AT when it expresses not merely a direction, but a target. Examples of the latter include POINT, SPIT, and THROW. One thing that is telling about all of these verbs is that they all include some kind of theme in their meanings even though that theme is not necessarily expressed. There is an interesting discussion in Bresnan (1994). It is interesting to see whether AT behaves in the same way with these verbs as it does with LOOK/A.

GRIMACE and SMILE are both like LOOK/A in that they require the subject's face to be orientated in the direction of the complement of AT and in that they entail that the complement of AT should understand a message has been communicated. They are different from LOOK/A in that the subject of GRIMACE and SMILE is the percept rather than the perceiver, although it is possible to have examples like he smiled at her but nobody noticed. Here smiled is a source rather than a percept.

POINT, SPIT and THROW are like LOOK/A in that they refer to a situation where there is a theme (which is not stated in the case of POINT and SPIT, but which is stated in the case of THROW). In the case of these verbs, the preposition indicates a target. The reason why LISTEN cannot occur with AT is that it does not have a theme (either stated or not) which can be understood as traversing the route from subject to the complement of the preposition.

Given the data in (31b-d), it is plausible to suggest that LOOK/A is conative. Conativity is usually associated with transitivity alternations where a verb that has a direct object alternates with a verb which has AT as an adjunct, and the direct object of the transitive variant as the complement of the preposition, as in (34):

(34) a. Jane banged the drum
    b. Jane banged at the drum
The syntactic alternation comes with an alternation in the semantics of the verb: in (34a), Jane makes regular successful contact with the drum, resulting in a percussive noise. In (34b), Jane does not necessarily make any contact with the drum at all, and there is certainly no certainty that there is any resulting noise. (34a), could indicate a failure or a success in carrying out the action which the sense of the verb is. The literature reviewed by Levin (1993), appears to assume that conativity only exists in an alternation as shown in (34). It is my contention, however, that the conative variant is not only to be found with a transitive alternant, but that it is possible to find examples that display all of the features of conativity although they have no transitive counterpart. These verbs include LUNGE, JUMP, RUSH, LAUGH, and RUN. LOOK/A is exactly such a verb. It is possible for there to be verbs that display all of the features that are associated with one variant in a transitivity alternation, without having the syntactic or semantic features that are associated with its co-variant. KILL is causative. There is no inchoative entry for KILL (although there is a separate verb DIE), but the absence of an inchoative alternant does not obviate the causative analysis for KILL.

Conativity implies that an action was attempted without specifying that it was carried out. A conative construction carries with it the strong implication that the action was not carried out, and the strong implication that the action was attempted repeatedly. Levin (1993: 42) says that the conative alternation is found with verbs "whose meaning includes notions of both contact and bodily motion." LOOK/A, the other LISTEN-class verbs which can occur with AT, and the verbs of facial expression mentioned above do not all include notions of contact and bodily motion. On the other hand, the semantics of these verbs includes an implicit theme, and although physical contact is not part of the meaning of all of them, there is a very real sense in which the unstated theme makes some kind of contact. In the case of LOOK/A, the gaze meets whatever is perceived and so the gaze could be claimed to make contact with the percept.

Nevertheless, there are problems with a thematic analysis: in some cases, the theme is hypothetical. If I point my finger at you, my finger is orientated along a
route which would take an object from me to you if there were such an object, but there are problems in distinguishing this from a static analysis in which there is no moving theme, and it is hard to see what the theme of the sense of WINK or GRIMACE would be.

2.2.5 Conclusions
To summarise, we have seen that the AT which collocates regularly with LOOK/A is, in fact, an adjunct and that its syntactic and semantic behaviour with LOOK/A is no different from its behaviour with other verbs. As a consequence, we have analysed LOOK/A as a conative verb.

We have also seen that there are some peculiar facts about spatial prepositions, which in some analyses have led to their being considered arguments rather than adjuncts. As Bresnan (1994) has shown, some are arguments and although AT after LOOK/A is not an argument, it is predicated of an implicit theme in the sense of LOOK/A. However, in the course of our assessment, there have been no grounds for supporting an analysis of AT as a complement of LOOK/A.

In addition, I have shown that the TO which occurs after LISTEN must be a complement. One consequence of this result is that LISTEN and LOOK/A must have different semantics. LISTEN does not have a theme for example. I examine what is included in their semantic entries and what they have in common in Chapter 4. I also explore what they have in common with the other verbs in the LISTEN-class. The thematic analysis of LOOK/A recalls Gruber (1967) which is discussed in Chapters 3 and 4.

Section 2.2.6 below looks at the complementation of FEEL/A, SMELL/A and TASTE/A; section 2.3 looks at the complementation of HEAR-class verbs and section 2.4 looks at the complementation of SOUND-class verbs.

2.2.6 The complementation of FEEL/A, SMELL/A and TASTE/A
These verbs are comparatively simple. They all have an object.

(35) a. Jane was dextrously feeling the lump
b. Jane was enthusiastically smelling the food

c. Jane was carefully tasting the food

In all the cases in (35), the lump or the food is the direct object. The manner adverb and progressive show that these are the agentive verbs rather than the stative ones. With certain adjuncts, the object is optional, although it is not optional without those adjuncts.

(36)  
  a. Jane was feeling (it) for flaws
  b. Jane was smelling (it) for extraneous odours
  c. Jane was tasting (it) for salt

Path adjuncts are fine with all of these verbs as we saw in section 2.1.3.

(37)  
Jane was feeling it through the fabric

Place adjuncts that occur with these verbs all refer to the location of the subject; in this respect they are no different from any other transitive verb, for example READ. I consider what different adjuncts can tell us about the meanings of these verbs in Chapter 4.

2.3 The complementation of HEAR-class verbs

HEAR-class verbs are quite different from LISTEN-class verbs in that they are all transitive, and that they can all have clausal complements, too. In this section I sketch the range of complement types that these verbs can occur with however, I do not look at the range of adjuncts that the verbs regularly occur with. The reason for this decision, which is slightly different from that pursued with LISTEN-class verbs, is that there is no question of whether a regular collocation with HEAR-class verbs is an adjunct or not. It is quite clearly the case that all the apparent instances of complementation that I look at in this section do actually involve complements. I
have to explore issues of collocation with certain adjuncts as we establish the semantic entry of the words concerned: I do this in Chapter 3.

All of the HEAR-class verbs can occur with direct objects and clausal complements and these kinds of complementation patterns are more straightforward than the others that I discuss. Consequently, I discuss these modes of complementation before looking at the more complicated patterns. The discussion is anchored in an account of SEE, which is the member of this class that has been most extensively discussed in the literature (for example in Akmajian (1978), Cooper (1974a), Declerck (1981, 1982, 1983), Dik & Hengeveld (1991), Emonds (1985), Felser (1994), Gee (1978)).

One of the issues that HEAR-class verbs raise is the way in which they interact with their complements. For example, SEE is supposedly stative, yet it rarely occurs as an inflected verb in the present tense. Often there is no I see or I am seeing. Typically, there is a preference for its being used as a bare infinitive after CAN. Quirk (1970) has some elicitation test evidence for this preference. However, HEAR-class verbs are unequivocally stative when they are complemented by tensed declarative clauses. The interaction of aktionsart and complementation is discussed in Chapter 3.

2.3.1 Direct objects and clausal complements
All of these verbs can occur with direct objects as the examples in (38) show.

(38) a. Jane saw the picture
    b. Jane heard the noise
    c. Jane felt the sandpaper
    d. Jane smelt the rotten eggs
    e. Jane tasted the soup

It is quite clear that the underlined phrases are the direct objects of the verb because the phrases can all be passivised, as the examples in (39) show.
(39)  a. the picture was seen by Jane
    b. the noise was heard by Jane
    c. the sandpaper was felt by Jane
    d. the rotten eggs were smelt by Jane
    e. the soup was tasted by Jane

In addition, all of these verbs can occur with clausal complements. The examples in (40) show that all of the verbs can be complemented by a tensed declarative clause headed by THAT.

(40)  a. Peter saw that Jane was crossing the road
    b. Peter heard that Jane was eating his ice-cream
    c. Peter felt that Jane was accusing him of something
    d. Peter smelt that something was burning
    e. Peter tasted that too much salt had been put in the soup

It is quite clear that it is that in all of these cases that depends on the HEAR-class verb. That is the root of the clause and the whole clause behaves as a constituent in a WH-cleft.

(41)  a. what Jane saw was that Peter had spots
    b. what Jane heard was that Peter was lying
    c. what Jane felt was that she should be less charming
    d. what Jane smelt was that Peter was burning old car tyres
    e. what Jane tasted was that Peter had put too much salt in the soup

The examples in (41) show that the THAT-clauses are all constituents.

The type of clausal complement varies from verb to verb, however. Although all of these verbs can have a tensed declarative clause as their complements, not all of them can be complemented by tensed clauses headed by WHY as (42) shows.
(42)  a. Peter saw why Jane hated the soup
    b. *Peter tasted why Jane hated the soup

(42b) has a potential interpretation in that it should mean the same as Peter tasted the reason why Jane hated the soup but it is not acceptable.

Finally, SEE, HEAR and FEEL can be complemented by tensed declarative clauses that are not headed by THAT as in (43a-c). At first glance, as in (43d-e), it appears that SMELL and TASTE cannot be complemented in this way but given an appropriate context such as a WH-cleft, they can.

(43)  a. Jane saw Peter was crossing the road
    b. Jane heard Peter was lying
    c. Jane felt Peter was accusing her of something
    d. ?Jane smelt something was burning
    e. ?Jane tasted something awful was in the soup

In (44) the WH-clefted examples show that the tensed declarative clause is a constituent. Therefore, its root, the tensed verb, is the complement of the HEAR-class verb. Furthermore, they show that once made the focus of certain constructions, this sort of complement is acceptable for all of these verbs.

(44)  a. what Jane saw was Peter was crossing the road
    b. what Jane heard was Peter was lying
    c. what Jane felt was Peter was accusing her of something
    d. what Jane smelt was something was burning
    e. what Jane tasted was something awful was in the soup

In conclusion, we have seen that all of these verbs can have an object and that they all can have a tensed declarative clause as their complement. When the tensed declarative clause is headed by THAT, it is the instance of THAT which is the complement of the HEAR-class verb; when the clause is not headed by THAT, it is
the tensed verb. Additionally, we have seen that a WH-cleft construction acts as a kind of focusing construction which ensures the acceptability of these examples. We have also seen that tensed clauses headed by words other than THAT are restricted to appearing as complements of SEE and HEAR; as WHY-clauses express a reason, we can assume that the restriction on WHY clauses is a semantic issue rather than a syntactic one.

In the next section, I sketch the analysis of some more complicated complementation patterns using SEE as my exemplar. In subsequent sections, I extend this pattern to the other verbs.

2.3.2 SEE

The complementation patterns that remain to be discussed are the complementation of SEE by a direct object and bare infinitive, and the complementation of SEE by a direct object and -ing word like RUNNING. It is also possible for SEE to be complemented by a noun and a TO infinitive as in *Jane suddenly saw Peter to be a fool*. The structure of examples like these is similar to examples of noun + bare infinitive complementation in that both TO and bare infinitives after SEE are xcomps. Therefore there is no need to discuss complementation by TO infinitives separately. There are examples in (45).

(45) a. Peter saw the moon rise over the mountain
    b. Peter saw the moon rising over the mountain

The main question about examples like (45a) is whether it involves object-control or an object raising. I argue below that it involves object raising. The questions about examples like (45b) concern the status of the -ing suffixed word. It could be a participle or a gerund. If it is a participle, there are two possible syntactic patterns that it could participate in: the raising construction and the participial relative construction. In the raising construction, the participle is xcomp of saw and the object of saw is its subject. If it is a gerund, then it is the gerund which is object of the HEAR-class verb. In the object + participle construction, the participle is an adjunct
of moon and it is a participial relative. I deal with the syntactic issue of the status of
the participle in this section and I discuss the (semantic) control vs raising issue in
section 2.3.2.3.

Only the xcomp analysis of participles is relevant to the valency of SEE. The
other two analyses do not affect the valency of SEE at all. I discuss them here in
order to identify a locus of syntactic ambiguity which has caused some analytic
confusion in earlier work.

Diagrammatic representations of these possibilities are given in Figures 2.1-
2.3. I have ignored unnecessary information such as the structure of the noun-phrases
in these examples. I demonstrate in the next section that SEE is an object raising and
not an object-control verb. I assume that analysis here. Figure 2.1 shows that an
object raising account can apply to both the infinitive and participle.

object raising

The diagram says that the object of saw is the (moon) and that the infinitive or
participle is the xcomp of saw. The object of saw is therefore the subject of the
xcomp. In raising, the referent of the xcomp is the ee of ‘see’. That is, what is seen is
the event, not the object. We can see that it is true that the ee of ‘see’ is an event and
not the object in examples like Jane saw the invisible man conducting the orchestra
(with a neon baton). Clearly Jane does not see the invisible man; she sees the
conducting. The diagram is simplified in that it does not show things such as the
sense of moon: I have only included material which is relevant to a grammatical
analysis.

Further evidence that the ee of ‘see’ can be an event and not a thing is found in
identity of reference anaphora (Declerck, 1982). In an example like Jane saw Peter
eating a cream bun; it was a messy deed, the anaphoric it refers to the referent of the xcomp and not to the thing expressed by the object.

Figure 2.2 presents a participial relative analysis.

participial relative

The most notable difference between a participial relative construction and an object raising structure is that in the participial relative the participle is not in a direct syntactic relation to the verb. It is an adjunct of moon. Furthermore, it is not the ee of 'see'. In a participial relative, the ee of 'see' is the object of saw. This interpretation, then, is not part of the valency of SEE. We can see examples where the ee of 'see' cannot be the situation described as in (46a) and we can see situations where the identity of reference anaphoric pronoun refers to the object-thing and not to the participle-situation as in (46b).

(46) a. Jane saw the wolves howling
    b. Jane saw the wolf howling; it had horrible yellow eyes

Howling cannot be detected visually. For (46a) to be true, aural confirmation is necessary. In (46b), the referent of it is 'the wolf', not 'howling'.
The gerund analysis states that the -ing word is the complement of the determiner/pronoun which is the object of the verb and with which it is coreferential. In this respect, the gerund behaves like any other noun in any other noun phrase. However, because of gerunds’ property of being a noun to their head and a verb to their dependent, him is also the subject of running in Figure 2.3. Gerunds frequently have possessive subjects. Because gerunds refer to situations and not things, the semantics of linking gerunds is the same as the semantics of linking ‘explosion’ in Jane saw the explosion. The ee of ‘see’ in Figure 2.3 is ‘him running’.

There are restrictions on these three analyses: simple pronouns cannot have adjuncts, so examples like those in (a) cannot be participial relatives. However, complex pronouns like ANYONE and SOMEONE can have adjuncts, so examples like (47b-c) potentially involve object raising, a participial relative, or a gerund.

(47) a. Jane saw him running
    b. Jane saw someone running
    c. Jane saw the man running

However, it is this three-way analysis that gives rise to the distributional properties that Akmajian (1977) notes. To give a simple example, (48a) shows that the moon rising over the mountain is a single syntactic unit, and therefore is evidence for the participial relative analysis, whereas the moon....rising over the mountain of (48b)
shows that there is no significant link between the moon and rising, therefore it supports the xcomp analysis.  

(48)  
a. it was the moon that everybody saw rising over the mountain  
b. it was the moon rising over the mountain that everybody saw  

On the other hand, the existence of these three possibilities gives rise to the possibility of vacuous syntactic ambiguity.  

2.3.2.1 Syntactic patterns and the valency of SEE  
Of the three interpretations of a noun and an ing-word occurring after SEE, only the xcomp analysis affects the valency of SEE. Both the participial relative analysis of some strings and the gerund analysis of others fit the pattern of SEE being complemented by a direct-object without an xcomp. In the case of the participial relative analysis, it is only the noun which is the direct object of SEE that is in a direct syntactic relation to SEE. As gerunds have the distribution of nouns, when the -ing word is a gerund it is the direct object of SEE.  

Felser (1994) argues that HEAR-class verbs are control predicates and that the event argument of the higher predicate controls the event argument of the lower predicate. She therefore ignores the participial relative analysis and the gerund analysis (on the grounds that while they muddy the analytic waters, they do not affect an account of the valency of SEE) while claiming that the raising analysis is wrong.  
Akmajian (1977) claims that when the NP following the HEAR-class verb is complemented by a participle, HEAR-class verb complements have a head-complement analysis at D-structure, but that they are non-constituents at S-structure. That is, Akmajian argues for only a participial relative account for the participial cases. For the infinitival cases, Akmajian argues for a ternary branching structure

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23 This diagnostic may not be robust. The syntactic link between an xcomp and its subject can also be relevant to constituency tests like clefting as examples like [i] show.  
[i] it was the moon rise over the mountain that we saw
where both the object NP and the infinitive are sisters of V at both D-structure and at S-structure. He does not recognise that the participial instances can be gerunds.

Gee (1977) claims that HEAR-class verb complements alternate between having an NP followed by a complement structure, and a sentential structure. That is, Gee argues for a participial relative analysis and a clausal one. He ignores the possibility of the gerund analysis.

Van der Leek and Jong (1982) believe that HEAR-class verbs have an object raising complementation pattern. They prefer a raising to a control account. Declerck (1982) recognises all three possibilities outlined here as does, for -ing participles and gerunds, Dixon (1991: 129-30). Jackendoff (1990: 202) claims that one meaning of an example like Bill saw Harry running in the park involves secondary predication analogous to Bill considers/finds Amy smart. That is, in my terms, he analyses running as an xcomp.

### 2.3.2.2 The subject of xcomps

We need not discuss the structure of strings involving gerunds or participial relatives as they are not relevant to the analysis of the valency of SEE. However, it is necessary to justify the subject relation between the object of an instance of SEE and its xcomp. At least three criteria indicate that there is a subject relation between these two elements.

- can the xcomp be passivised? If we look at (49), we can see that the xcomp of (49a) is passivised in (49b). This clearly suggests that the object of saw is the subject of the xcomp.

(49)  
\[ \begin{align*} 
\text{a. Jane saw Peter ice/icing the cake} \\
\text{b. Jane saw the cake be iced by Peter} 
\end{align*} \]

- can the object and the xcomp be treated as a constituent according to standard constituency tests? I claimed above that this datum was irrelevant to the xcomp
analysis and was more relevant to the participial relative analysis. However, linguists working in the phrase-structure tradition will recognise this as a potential diagnostic of subjecthood and certainly, with an infinitive, subject is the only syntactic relation linking the object of the verb and the xcomp. If they can be treated as a constituent, there must be a direct syntactic relation between them. The example in (50) shows that Peter ice/icing the cake in (49a) is a constituent.

(50) what Jane saw was Peter ice/icing the cake

- are subject idiom patterns possible in these examples? If they are, it shows that the object of saw is the subject of the xcomp. As it is not possible for expletive words to have adjuncts, these examples exclude the possibility of a participial relative analysis.

(51) a. Peter saw the shit hit/hitting the fan
    b. Peter saw all hell break/breaking loose

The examples in (49) - (51) make it quite clear that there is a subject relation between the noun and xcomp. Furthermore, they make it quite clear that the subject relation exists irrespective of whether the xcomp is a bare infinitive or a participle.

2.3.2.3 Control versus raising

The WG view of object raising asserts that the referent of the object of the verb is not in a semantic relation to the sense of the verb. Postal (1974) makes the same assertion. However, there is a second issue. In a Phrase Structure Grammar account, the raised object is only subject of the verb’s xcomp at some stage in the derivation,

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24 Langacker (1995) and Hudson (1990) argue for a similar account of raising and control, although my account is not exactly theirs. The view of raising and control that I take is that both involve a verb that has an xcomp. If the verb also has an object, the object is the subject of the xcomp. If not, the subject of the verb is also the subject of the xcomp. This much is uncontroversial. Both object raising and control involve the ee linking to the xcomp. The difference between them is that in object-control, the object is in a force-dynamic relation to the subject, it is the antagonist, whereas in object raising the object is in no semantic relation to the verb whatever.
that is, while it is in the same clause as the xcomp. Furthermore, GB and its lineal
descendants does not allow object raising, calling verbs which display the phenomena
discussed here “Exceptional Case Marking Verbs” (Haegeman 1991). Postal and
Pullum (1988) makes a clear case for accepting the existence of object raising. As
WG does not have a role for clauses, and as the distribution tests apply equally well
for structures apart from those found in object raising, the arguments here centre on
the semantic role of the object of SEE. If its semantic role is not determined by SEE,
then raising is involved. If its semantic relation is determined by SEE, control is
involved. EXPECT is an object raising verb. PERSUADE is an object-control verb.
These issues were discussed in 1.2.3.1.

(52) a. Jane expected him to kiss the dog
    b. Jane persuaded him kiss the dog

In (52), there is no semantic relation between the sense of expected and the referent of
him, but there is a semantic relation between the sense of persuaded and the referent
of him. There are two diagnostics for determining whether there is a semantic relation
or not. First, if the truth-conditions of the subordinate clause remain constant under
passivisation there is not a semantic relation. Secondly, if the object can be expletive
there is not a semantic relation.

(53) a. Jane expected the dog to be kissed by him
    b. Jane persuaded the dog to be kissed by him

The truth conditions of (53a) are the same as those of (52a) but the truth conditions of
(53b) are different from those of (52b). This shows that the object of persuaded does
have a semantic relation to the verb while the object of expected does not. And if we
take examples like those in (54), we can see that EXPECT can have expletive objects
and PERSUADE cannot.

(54) a. Jane expected it to rain
b. Jane expected there to be an accident
c. Jane persuaded it to rain
d. Jane persuaded there to be an accident

The data in (54) support the analysis of the data in (53).

If we examine SEE, we can see that it patterns just like EXPECT. In (55), we can see that truth-conditions are preserved under passivisation of the subordinate clause.

(55)  
   a. Jane saw Peter to have drawn a circle  
   b. Jane saw a circle to have been drawn by Peter

In (56), we can see that expletive objects are possible after SEE.

(56)  
   a. Jane saw it rain  
   b. Jane saw it raining

All of the objects of saw in the examples in (56) are expletive. The evidence in (55) and (56) clearly supports an object raising analysis of SEE.

These facts show that SEE is not exactly akin to what Gee (1977) calls "Naked Infinitive" verbs like MAKE and LET. MAKE and LET appear to be like raising verbs in that they can have a clause with an expletive subject as their xcomp, but they are unlike SEE in that the truth-conditions of the sentence are not preserved under passivisation of the xcomp.

(57)  
   a. Peter made it rain  
   b. Peter made the doctor examine the patient  
   c. Peter made the patient be examined by the doctor

In (57a), it appears that the xcomp is the ee of the main verb, but in (57b-c) it seems that the direct object is the ee of the verb and that the xcomp stands in some other
relation to the verb. In fact, MAKE and LET appear to be ambiguous between raising and control structures depending on whether the direct object of the main verb is expletive or not. I suspect, therefore, that it is best not to analogise too much from the syntax of MAKE and LET to the complementation of SEE. On the other hand, it is clear that the peculiarity of the passivisation of SEE when it has an xcomp (discussed further in 2.3.5) holds with MAKE and LET. With an active main verb, TO is excluded; with main verb passivisation a TO xcomp is required.

(58) a. Jane made/saw Peter go home
    b. *Jane made/saw Peter to go home
    c. Peter was made/seen to go home
    d. *Peter was made/seen go home

We need to recognise similarities between MAKE, LET and SEE as far as the TO facts are concerned. I return to these facts in section 2.3.5 below.

2.3.2.4 Diathetic SEE

In (59), we see that INTO and TO can both occur with SEE when there is no object present. We also see that they cannot occur when there is an object present.

(59) a. Jane saw into the box
    b. Jane saw to the horizon
    c. *Jane saw Peter into the box
    d. *Jane saw Peter to the horizon

The facts in (59) are peculiar for a number of reasons. They certainly show that SEE has idiosyncratic behaviour with directional prepositions. The fact that the presence of a preposition-phrase blocks an object suggests that this is a diathetic alternation: the

25 I am ignoring the idiomatic meaning of SEE +noun + INTO.
object alternates with INTO and TO, for example, but not with THROUGH as (60) shows.

(60) Jane saw Peter through the crowd

For the examples in (59) to be a case of a diathetic alternation, it is necessary to identify that the prepositions are complements of saw. Very few verbs appear in this transitivity alternation: REACH is the only alternative that I am aware of. SPIT and VOMIT can occur with directional prepositions and no objects, but the presence of the preposition does not preclude the presence of the object. The pattern exemplified by (59) is not noted in Levin (1993).

Bresnan (1994) claims that spatial prepositions can be adjuncts or complements. When they are complements, they are predicated of a theme element in the semantic structure of their head. Typically, the theme is the referent of the subject or the object of the head of the preposition. When spatial prepositions are adjuncts, they behave like prototypical adjuncts and the referent of the sense of the adjunct is the referent of the head of the adjunct. There are, however, other criteria for the adjunct / complement distinction; Bresnan (1994) offers two tests for distinguishing between adjunct locatives and complement locatives. These criteria are similar to those in 2.2.2.1. The first, from Reinhart (1983: 68-72) is that adjuncts can be preposed before questioned subjects but complements cannot. The second, from Lakoff and Ross (1976) involves SO-anaphora, where an adjunct can be excluded from the interpretation but an argument cannot.

(61) a. on the corner who drank?
    b. *on the corner who stood?

[Bresnan’s examples; judgements Bresnan’s / Reinhart’s]

According to Bresnan, the examples in (61) show that the phrase on the corner is an adjunct in (61a) but a complement in (61b). Her claim is that it is acceptable to prepose spatial expressions which are adjuncts but it is not possible to prepose
locative expressions which are complements. If we apply the test to SEE, it is clear that by this test the directional preposition is a complement of the instance of SEE and not an adjunct of the instance of SEE.

(62)  
  a. !into the room who saw?  
  b. !over the rim of their glasses who saw?

The preposed prepositions in (62) are not acceptable. However, despite Bresnan and Reinhart's claims, the goodness or badness of these examples is not a clear-cut case of grammaticality, so I have flagged the examples in (62) with "!" rather than with asterisks.

The SO-anaphora test involves cases like (63).

(63)  
  a. Rose was knitting among the guests and so was my sister (alone in her bedroom)  
  b. Rose was sitting among the guests and so was my sister (alone in her bedroom)  
[adapted from Bresnan's examples]

The significance of the SO-anaphora test lies in whether the inclusion of the parenthetical material makes the conjunction of the two clauses contradictory or not. If it is not contradictory, the preposition is an adjunct of the sense of the verb as in (63a). If it is contradictory, the preposition is a complement of the sense of the verb as in (63b). There are examples with SEE in (64).

(64)  
  a. !Jane can see into the cupboard and so can Peter into the box  
  b. !Jane can see over the rim of her spectacles and so can Peter under the rim of his hat

The SO-anaphora test shows that with SEE the preposition must be a complement and not an adjunct. In conclusion, on the basis of Bresnan's (1994) diagnostics, when a
directional preposition occurs with an instance of SEE, it must be a complement and not an adjunct of the instance of SEE.

Complement spatial prepositions are, in Bresnan's (1994) terms, predicated of either the subject or the object of their head. That is, when spatial prepositions are complements they are, in fact, xcomps. The examples in (65), where went is a prototypical verb of motion, show that it is clearly plausible to analyse directional phrases as xcomps.

(65) a. Peter went into the room
   b. Peter went through the wall

Intuitively, it is clear that into and through are predicated of the subject of the verb in some way. If we take examples of verbs of motion with a direct object, we can see that the preposition is predicated of the direct object.

(66) a. Jane moved the box into the room
   b. Jane pushed Peter through the wall

The claim that the prepositions in (65) and (66) are xcomps means that they take the object of their head as their subject unless their head has no object. In this case they take the subject of their head as their subject. So in (65) the subject of into is Peter and the subject of through is Peter. In (66), the subject of into is the box and the subject of through is Peter.

A clear test of a word's ability to be an xcomp is whether it can occur (with its subject) as the xcomp of WITH in an absolute construction, as the xcomp of CONSIDER, or as the xcomp of EXPECT. It is hard to get INTO in these cases (possibly because it refers to a punctual traversing of a boundary) but IN and THROUGH are fine. In the constructions with CONSIDER and WITH, both prepositions refer to a location. In the constructions with EXPECT, THROUGH is ambiguous, it could refer to either a direction or a location.
It is clear that locative prepositions are able to be xcomps of the verb which is their head. The evidence from THROUGH suggests that directional prepositions can be xcomps too. This conclusion is further supported by the presence of similar analyses in theories as diverse as Cognitive Grammar (Langacker 1987: 217-8) and Government and Binding (Aarts 1992: 172). In the light of these facts, I assume that an xcomp analysis is appropriate when locative and directional prepositions are complements. On the basis of this analysis, we can identify the theme as the semantic relation between the sense of the head and the referent of the dependent which may also be the er of the sense of a locative or directional preposition.

There are, however, examples like (70a) where into is the complement of spat, as the examples in (70b-c) show, and there is no object of spat but, nevertheless, the subject of spat is not the subject of into. Certainly, the referent of Jane is not the er of the sense of into.

(70) a. Jane spat into the fire
   b. !into the fire who spat?
   c. !Jane was spitting into the fire and so was Peter at the dog

However, as I said above, the object of SPIT can occur with the directional preposition, so this is not a direct analogy with SEE.

26 If this example seems odd, imagine a situation where for Peter to get a prize at a children’s party, he has to have entered a particular room in a game of “Sardines”. By the time Peter got to the room, it was pretty full and Peter got only half-way in; some of his anatomy remained outside. The adjudicator could utter (68a) thereby decreeing that Peter received his prize.
(71) a. Jane spat blood
    b. Jane spat her false teeth into the fire

There is a potential semantic account of this alternation which is discussed in Chapter 3. The conclusion here is that a directional preposition can be the xcomp of an instance of SEE in which case it blocks the presence of the object of SEE. In these circumstances, it is predicated of a theme which does not have syntactic expression.

2.3.3 HEAR, FEEL/E, SMELL/E, AND TASTE/E

In this section, I discuss the remaining HEAR-class verbs. As I have already demonstrated that all of the HEAR-class verbs can have a direct object and a clausal complement, all that needs to be demonstrated in this section is that they can all have infinitival and participial xcomps and that there is a potential ambiguity with participial relatives and gerunds.

The first issue is whether all of these verbs can have infinitival and participial xcomps.

(72) a. Jane heard Peter tell/telling a lie
    b. Peter felt the spider crawl/crawling up his back
    c. Jane smelt the gasworks give/giving off a sulphurous emission
    d. Peter tasted his sweet change/changing flavour

With the exception of (72d), all of the infinitival xcomps in (72) can be passivised with their demoted subject occurring in a BY-phrase. I cannot think of an example for TASTE/E where the xcomp has an object that can be promoted.

(73) a. Jane heard a lie be/being told by Peter

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27 There is a pragmatic problem with tasting a situation. However, if you imagined sucking a sweet that changed flavour as its outer layers dissolve, it would be possible to say I tasted my sweet change flavour.
b. Peter felt his back being crawled up by a spider

c. Jane smelt a sulphorous emission being given off by the gasworks

We can see from the examples in (73) that the object of the perception verb / subject of the xcomp is demotable when the xcomp is passivised. The ability of the xcomp to be passivised establishes that there is an xcomp present rather than a participial relative or a gerund. We can identify cases where the ee of perception has to be the event identified by the xcomp rather than the thing identified by the direct object. There are examples for HEAR in (74), for FEEL/E in (75), and for SMELL/E in (76).

(74)  
   a. Peter heard it raining
   b. Jane heard Peter crunch through the gravel
   c. Jane heard Peter kill the cat
   d. Jane heard the cat be killed by Peter

In (74a), the expletive *it* is evidence that what is heard is the act of raining. In (74b), the ee of hearing is the crunching. And (74c-d) show that the truth conditions of the xcomp remain constant under passivisation of the xcomp. Consequently, we can be sure that HEAR is a raising verb: the ee is the referent of the xcomp and the object of *heard* in all of the examples in (74) is not semantically related to its head.

We see that the same set of facts are true for the other verbs.

(75)  
   a. Peter felt it blowing on his face
   b. Peter felt the spider crawl up his back
   c. Peter felt his back being crawled up by the spider

The *it* of (75a) is expletive. In (75b-c) we can see the truth conditions remaining constant under passivisation and in (75b) what Peter feels is not the spider but its action. If I say *I felt the spider crawl up my back* the asserted thing is that I felt something. The presupposed thing is that it was a spider.
Expletive subjects are hard to get with SMELL/E but we can see that in (76) the truth conditions remain constant and that what is smelt is the burning, not Peter or the dinner. With TASTE/E, it is hard to get the kind of reading that we find in (74)-(76) above for pragmatic reasons. It is difficult to get a context where the ee of TASTE/E could be not a thing but an event. For example, imagine a situation where you were sucking a boiled sweet that changed flavour halfway through sucking as you got through the hard outer shell into the liquid centre. It would be plausible to say I tasted the flavour change/changing. Or imagine a situation where you had an unpleasant oral fungus that changed flavour as it grew. It would be possible to say I tasted the fungus grow(ing). In these cases, as we can see, it is not that TASTE/E does not fit the same syntactic pattern as the other verbs in this class, but that it is unlikely to occur in the appropriate contexts.

2.3.3.1 Syntactic ambiguities
The next task is to show that HEAR, FEEL/E, SMELL/E and TASTE/E have the same kinds of ambiguities that SEE has. A priori, we can assume that there is the same ambiguity with participial relatives: participial relatives are simply adjuncts of a noun and, therefore, any common noun + participle sequence can be interpreted as a participial relative.

Finally, we can be sure that the same ambiguity will hold with gerunds. As gerunds have the distribution of nouns, they fit the valency requirements of SEE when it is complemented by a direct-object and no xcomp. Therefore, any examples involving possessive nouns and -ing words are clear cases of gerunds, but in any situation where there is a non-possessive noun or pronoun followed by an -ing word, the construction will potentially be ambiguous.

The issue in each of these cases rests on whether the ee of the sense of the verb can be a situation as well as a thing. It is clear that for all perception verbs, the ee can be a thing. All of the examples in (77) are fine.
97

(77)  
a. Jane saw the apple  
b. Jane heard the noise  
c. Jane felt the apple  
d. Jane smelt the apple  
e. Jane tasted the apple

Furthermore, we have seen that all of these verbs can occur with xcomps, therefore they can all have situations as their ees. All three interpretations of perception verb + noun + -ing word strings are therefore possible even though these three interpretations only instantiate two valency patterns: one where the verb has a direct object and one where the verb has a direct object and an xcomp.

2.3.4 Conclusions
I have shown that the complementation patterns for all of the verbs in this class are very similar. They all occur with direct-objects; they all occur with direct objects and bare infinitives; they all occur with direct-objects and an -ing word. They all occur with THAT-clauses, although they do not have the direct perception sense when they occur with THAT-clauses.

The discussion has shown that for all the different interpretations that are possible, only a few complementation patterns actually exist. These patterns are:

- direct object
- direct-object + xcomp
- THAT-clause

I take it that the participial relative is not specified in the valency of the HEAR-class verb. Furthermore, a gerund is a direct-object. These observations show that many of the differences that we have brought out lie in the semantics rather than in the syntax of the verbs concerned. This has been patently true of the question of ee assignment which has underscored much of the discussion above; the reason why such a
discussion was present in a chapter that is ostensibly about syntax is that the distinctions being discussed are treated as syntactic issues in most other work on these verbs. This issue is related to other semantic matters, such as the temporal relations that hold between a HEAR-class verb and what follows it: I discuss these matters in greater detail in Chapter 3.

2.3.5 Passivisation facts

One phenomenon that I have not looked at in detail is that of passivisation. This issue was raised briefly in 2.3.2.3. All of these verbs can passivise when they have a bare infinitive xcomp, but when they do, the xcomp does not remain the same: the passive’s xcomp has to be an xcomp with TO. This is true of SEE, HEAR, and FEEL/E.

(78)  
   a. Peter saw Jane eat the chocolate  
   b. Jane was seen *(to) eat the chocolate  
   c. Peter heard Jane run up the stairs  
   d. Jane was heard *(to) run up the stairs  
   e. Peter felt the wind blow on his face  
   f. the wind was felt *(to) blow on Peter’s face

However, the same facts do not seem to be true of SMELL/E and TASTE/E. In these cases, it is hard to get a passive with an xcomp that makes sense.

(79)  
   a. Peter smelt the food bum  
   b. !the food was smelt to burn  
   c. Peter tasted the sweet change flavour  
   d. !! the sweet was tasted to change flavour

Infinitival TO raises other issues. It is required in cases where the main clause is passive. Duffley (1992) and Felser (1994) have noted that infinitival TO cannot occur in cases where the main clause is active except in those cases where the subordinate
verb itself depends on an aspectual polarity verb such as BE or HAVE. In those cases, TO is required. There are examples in (80).

(80)  
   a. *Peter saw Jane have drawn a circle  
   b. Peter saw Jane to have drawn a circle  
   c. *Peter saw Jane be drawing a circle  
   d. Peter saw Jane to be drawing a circle  
   e. Peter saw Jane be nice  
   f. Peter saw Jane to be nice

(80a-b) show that a perfect complement-clause actually has to have TO; a progressive complement clause depending on BE also needs to have TO as (80c-d) show; and a complement clause with BE + predicative can occur with or without TO, as (80e-f) show. The last two examples also bring out a nice distinction, which is that the occurrence of TO in the complement clause is related to the aspect of the complement-clause. In (80e), the natural interpretation is that Jane is being temporarily nice; in (80f), it is that Peter recognises that Jane is inherently nice.

These facts about TO and complementation are not at odds with the raising analysis which holds irrespective of whether TO is present or not. The problem that they present is about whether they are present or absent in the first place. It could be that the TO facts are evidence that SEE + xcomp does not have a passive. I think that SEE + xcomp does have a passive and that the requirement for TO to be present is an aspectual one. There is further evidence in that the only way to get an aspectual polarity verb + present / perfect participle complement of SEE is as the dependent of TO. It looks as though the presence or absence of TO is an aspectual matter rather than a syntactic one. Dixon (1991: 231) makes a similar claim when he points out that the requirement for TO with passives is due to the stativity of the passive voice.

Bach (1980) offers an analysis of passive SEE complemented by an xcomp which draws on Akmajian’s (1977) account of these structures. Kirsner (1977) presents a semantic discussion of the passive of these structures, which draws out the non-synonymy of active and passive forms. There is also a discussion in Mittwoch
Bennis and Hoekstra (1989) conduct an account of the passivisation of HEAR-class verbs with infinitival complements in terms of the split INFL hypothesis of Government and Binding theory.

2.4 The complementation of SOUND-class verbs

In this section we shall discuss patterns like those in (81):

(81)  
a. the dog looks mean  
b. the dog sounds mean  
c. the dog’s coat feels scurvy  
d. the dog smells unsavoury  
e. the dog’s food tastes revolting

Verbs like those underlined in (81) look like they have the same complementation pattern as SEEM. The structure of (81a) is shown in Figure 2.4.

![Figure 2.4](image)

The most extensive discussion of these verbs is found in the work of Rogers (1971, 1973, 1974).

The issues that these verbs raise are:

- are they subject raising or subject-control?
- what xcomp types are possible?
- are their complements always xcomps?

In at least one respect these verbs are nearer HEAR-class verbs than they are LISTEN-class verbs; the complementation patterns are generally consistent throughout the class and there is little variation across the sensory-modalities. As with the other verbs, I begin with vision. Having used LOOK/P to lay out the
lineaments of the discussion, I explore the complementation of the other verbs in this class using the categories that the discussion of LOOK/P shows to be relevant. One relevant issue, an area which involves looking at semantic relations as well as syntactic relations, is the question of whether these are subject raising or subject-control verbs.

2.4.1 LOOK/P

This verb occurs with an adjective as its xcomp; it occurs with a wide range of other complements too. I have given a full list of examples in (82).

(82)  
(a) the picture looks interesting  
(b) Jane looks a nice girl  
(c) Peter looks like a woolly mammoth  
(d) Peter looks to be a nice boy  
(e) Jane looks like she is drunk  
(f) it looks like Jane is drunk

These examples need some discussion. I shall present them under a number of subheadings for it seems to me that the issues which they raise are best dealt with in discreet units.

2.4.1.1 Non-verbal xcomps

(82a-c) show that LOOK/P can occur with an adjective, a noun-phrase and preposition as its xcomp. The only preposition that can occur as the xcomp of LOOK/P is lexically specified, however. It is LIKE/preposition.

All of the non-verbal xcomps of LOOK/P are obliged to be gradable. This is a requirement which is analysed in 5.2.2. Here, I sketch the nature of the requirement. The requirement that the non-verbal xcomp of LOOK/P should be gradable is true also of SEEM and the other SOUND-class verbs. There are some examples in (83) showing that it is necessary for the xcomps of these verbs to be gradable.
(83) a. !the explosion looked atomic  
b. !Jane looks a girl

ATOMIC is (exceptionally) a non-gradable adjective. It is not possible to utter strings like very atomic. A noun-phrase is not gradable, usually, unless it is adjectivally modified. So the examples in (83) show that non-gradable xcomps of LOOK/P are unacceptable. Noun-phrase that are inherently gradable are fine as (84) shows.

(84) Peter looks a fool

As the noun FOOL is inherently gradable, (as in an utter fool) it does not need to be adjectivally modified.

As LIKE is the only preposition that can occur after these verbs, and as it is gradable (as in he looks very like his sister) LIKE/preposition also contributes to the argument that the xcomp of LOOK/P must be gradable.

If we take the case of adjectives and noun-phrase xcomps, we can see that SEEM also requires its xcomps to be gradable.

(85) a. !Jane seemed a boy at first  
b. !the explosion seemed atomic

However, there is a difference between SEEM and LOOK/P in that both of the examples in (85) are fine if there is an interposing to be between seemed and the noun-phrase or adjective. This is not the case with LOOK/P. This case is discussed in the next section.

2.4.1.2 TO xcomps

(82d) showed that LOOK/P can have a TO xcomp if it occurs with BE and a noun-phrase. However, LOOK/P cannot have a TO + BE xcomp in any other circumstances.
103

(86)  a. Peter looks to be a nice boy
    b. !Peter looks to be nice
    c. !Peter looks to be leaving

The structure of (86a) is shown in Figure 2.5.

Figure 2.5

The examples in (86) show that LOOK/P places the gradability requirement right
down the chain of xcomps. That is, the xcomp of the xcomp of the xcomp of looks, a
nice boy, is still obliged to be gradable. Furthermore, LOOK/P cannot have any other
kind of verb infinitive as the xcomp of its TO xcomp.

(87)  a. *Jane looks to have gone
    b. *Jane looks to fly

Given that the category of a TO xcomp is not affected by the category of its xcomp,
the restriction is semantic not syntactic. The restriction is that only a category
membership assignment is possible with a more complicated structure; hence only BE
+ a noun phrase can occur as the xcomp of LOOK/P. The other possible xcomps are
not compatible with category assignment.

The examples in (88) show that LOOK/P is different from SEEM in that
SEEM has a wider range of possibilities than LOOK/P.

(88)  a. Peter seems to be leaving
    b. Peter seems to fly (whenever he appears as a fairy in panto)
    c. Peter seems to have gone
The data here show that what can appear as the xcomp of LOOK/P is restricted to whatever can be in a “be” relation with LOOK/P. If the “be” relation is not available, the xcomp is not acceptable. This fact is compatible with the one that we noted in the discussion of (86), where the gradability requirement extended right down the chain of xcomps of LOOK/P.

2.4.1.3 Complementation by LIKE and AS THOUGH

(89a-b), which repeat (82e-f) both show that it is possible to have like as the complement of looks in these examples; like in (89a-b) is an acategorematic word which is the clausal complement of looks.

(89)  a. Jane looks like she is drunk
       b. it looks like Jane is drunk

In (89b), the subject of looks is an expletive pronoun: it. Typically, such a fact would be taken to be a useful piece of evidence that the looks was a raising verb, and we shall review the question of whether SOUND-class verbs are raising verbs or not below. However, as Rogers (1972, 1974) points out, there is not a simple paraphrase relation between sentences like (89a-b). If Jane looks like she is drunk, as in (89a) then the inference that Jane is drunk is drawn upon the available evidence that Jane’s appearance provides. However, if Jane leaves a particular trail of evidence when she gets drunk, (89b) need not refer to Jane’s appearance at all. It could be an inference drawn on evidence such as the state of Jane’s room, or the state of Jane’s drinks cupboard. These facts provided Rogers with some trouble in his attempt to establish how sentences like (89a-b) might be transformationally related. I discuss what they have in common in Chapter 5.

There are two other phrases which have the same properties as LIKE: AS THOUGH and AS IF. What is interesting here is that neither AS nor THOUGH will do on its own. Both words are required in order to generate a grammatical sentence. They constitute an idiomatic subordinating phrase, which, apart from being constituted of two words, could well be just one word.
These two sets of examples pose particular problems of analysis. In Chapter 4, I discuss whether these clausal complements have the properties of other clausal complements and I demonstrate that they do not: in many respects, they appear to behave like xcomps. There is another problem: the non-synonymity of (89a-b) suggests that there may be two senses of LOOK/P, or two senses of LIKE, or both. These questions are discussed again in Chapter 5.

2.4.1.4 Complementation by THAT
LOOK/P cannot take a clausal complement headed by THAT. SEEM, on the other hand, can take a clausal complement headed by THAT, albeit only when it has an expletive subject as shown in (90).

(90)  a. it seems that Jane is drunk
     b. *Jane seems that she is drunk
     c. *it looks that Jane is drunk
     d. *Jane looks that she is drunk

(90b) is ungrammatical because the sense of SEEM has only an er, which is always a propositional complement; the referent of a THAT-clause is always a proposition and so it is not possible for seems in (90b) to have two arguments. (90a) is fine, because it and the that-clause are co-referential, therefore, seems in (90a) has only one argument.

The question that the examples in (90) provoke is why SOUND-class verbs cannot have THAT-clause complements. An expletive it subject with a coreferential clausal complement is fine for LOOK/P, (as in (89b)) but why can it only occur with LIKE- and AS THOUGH-headed clauses? Clearly, the LIKE-clauses which complement LOOK/P are qualitatively different from THAT-clauses which complement SEEM. Although LIKE-clauses can occur with SEEM, they are not the same as they are for LOOK/P as the examples in (91) show:

(91)  a. ?*Jane seems like she is drunk
b. It seems like Jane is drunk

(91a) is decidedly odd, although (91b) is fine. The examples in (91) show that LIKE behaves in the same way as THAT after SEEM so the data in (91) suggest that LOOK/P is semantically different from SEEM. The fact that the complementation of LOOK/P is more restricted than that of SEEM possibly follows from the more specific semantics of LOOK/P.

Specifically, an account of such data rests not in the modal nature of SOUND-class verbs but the number of semantic arguments that they have. They are at once evaluative and comparative. A THAT-clause presents a simple proposition, often, after SEEM, as a reasonable evaluation of a situation, or as a reasonable interpretation of facts. SEEM has only one semantic argument. But strings such as look like and look as though which have either expletive subjects or subjects that are picked up by resumptive pronouns in the subordinate clause when they complement LOOK/P suggest that LOOK/P has a greater number of arguments than SEEM; we shall explore semantic relations of SOUND-class verbs below.

2.4.1.5 How many arguments does LOOK/P have?

An additional issue is the status of the to me phrase in the following examples. All of the SOUND-class verbs can have to me as an experiencer phrase.

(92)  a. the picture looks interesting to me
       b. Jane looks a nice girl to me
       c. Peter looks to be a nice boy to me
       d. Jane looks like she is drunk to me
       e. it looks like Jane is drunk to me
       f. Peter looks as though he hasn’t slept to me
       g. it looks as though Peter hasn’t slept to me

The question is the status of the TO-phrase and whether it is a complement or an adjunct. I think that the evidence is, at best, mixed but there are some grounds for
thinking that it is a complement. These grounds are, first, that the form of the
experiencer phrase appears to be fixed: there is no other way of encoding an
experiencer; secondly, that in the anaphoric DO test it comes up as a complement;
and, third, that it is clearly an argument of the verb and arguments are generally taken
to be complements. Although the experiencer does not have to be syntactically
present at all times, it is semantically present all of the time. If the experiencer is not
stipulated there is a default assumption that the experiencer is the utterer of the
statement. This default assumption is appropriate given the modal nature of these
verbs. Any epistemic modal verb has an evaluator or experiencer, and typically this
text is the utterer of the sentence containing the verb.

If the TO-phrase is an argument of the verb, however, it raises the question of
how many arguments the verb has. In the case of SEEM the phrase is optional, and
there is no correspondence with other facts. In the case of LOOK/P, on the other
hand, the TO-phrase does appear to interact with one other set of facts that are
relevant to a description of the number of arguments that the verb has.

If we look at the aktionsart of SOUND-class verbs, we might deduce that they
are stative. This is the position of Rogers (1973), and it is certainly the case when
SOUND-class verbs occur with experiencer TO-phrases.

(93)  a. Peter looks drunk to me
      b. ?/*Peter is looking drunk to me

These facts are apparently similar to those for SEEM:

(94)  a. Peter seems drunk to me
      b. *Peter is seeming drunk to me

Where they differ from the SEEM data is in the following: if there is no experiencer
TO-phrase, it is possible for these verbs to occur in the progressive.
Occurrence in the progressive does not by itself say anything about the number of arguments that a verb has; it is neither a necessary nor a sufficient test of agentivity. A number of raising verbs, particular aspectual verbs like BEGIN can occur in the progressive. However, it is interesting that while there is not a semantic relation between SEEM and its subject, the progressive appears to indicate that there is between LOOK/P and its subject. Furthermore, the fact that the progressive is unable to occur simultaneously with an experiencer phrase is suggestive: it implies that there is some kind of argument relation between the subject of LOOK/P and the verb, but that this argument relation is only present when the TO-experiencer argument is not present. The data are reinforced when we look at examples where the progressive subject is unequivocally agentive. In (95), the status of the TO-phrase is doubtful. In (96), it is quite clearly the case that the TO-phrase is not acceptable. The adverb forces an agentive interpretation of the subject.

(96) Peter is deliberately looking drunk (*to me)

As a first assessment of the situation, I take it that the verb in (96) is not modal and is not evaluative in the same way as the verb in (95a), for example. If that is the case, it would account for the unacceptability of the experiencer phrase, but it would suggest that there may be two senses of LOOK/P, one with an agentive subject and one without.

The question of how many arguments LOOK/P has and the related question of how many senses it has are issues not only raised by the data in this section, but also by the data in section 2.4.1.3 and the discussion of the semantics of LIKE and AS THOUGH complementation. Chapter 5 consists in large measure of a discussion of these issues.

The sections below discuss the syntax of the rest of the SOUND-class verbs in the light of the general issues raised by the discussion of LOOK/P.
2.4.2 SOUND

With one exception, SOUND behaves exactly like LOOK/P. Its non-verbal xcomps have to be gradable, as the examples in (97) show. Also, SOUND can have a LIKE/preposition xcomp. LIKE is the only preposition that can occur as the xcomp of SOUND.

(97)  a. the dog sounds very dangerous
       b. *Fido sounds a dog
       c. Fido sounds a nice dog
       d. the dog sounds like a wolf

Unlike LOOK/P, SOUND cannot have a TO xcomp followed by anything, as (98) shows. This restriction is also true for the other verbs in the class.

(98)  *the dog sounds to be dangerous

SOUND can also be complemented by LIKE/clausal and AS THOUGH and AS IF. When it is, it raises the same problems of analysis that LOOK/P raises.

(99)  a. the dog sounds like it is dangerous
       b. it sounds like the dog is dangerous
       c. the dog sounds as though it is dangerous
       d. it sounds as though the dog is dangerous

Finally, SOUND has an optional TO ME experiencer, which places the same restrictions on the progressivity of the verb as we found in the discussion of LOOK/P.

(100) a. the dog sounds dangerous (to me)
       b. the dog is deliberately sounding dangerous (*to me)
The examples all suggest, therefore, that the complementation of SOUND raises precisely the same set of issues that the complementation of LOOK/P raises.

2.4.3 FEEL/P

FEEL/P is polysemous, but its polysemy does not affect its syntax. I shall limit myself in this discussion to FEEL/P of external physical sensation. The complementation of FEEL/P involves the same initial issues as that of LOOK/P and SOUND. (101) shows that FEEL/P can have an adjective as its xcomp, a noun-phrase as its xcomp and LIKE/preposition as its xcomp. All of these xcomps have to be gradable.

(101)  a. Peter feels warm
       b. *velvet feels a fabric
       c. velvet feels a soft fabric
       d. birdseed feels like sand

FEEL/P is like SOUND in that it cannot have a TO xcomp at all.

(102)  *the radiator feels to be warm

FEEL/P can have clausal complements of the same kind as SOUND and LOOK/P.

(103)  a. the radiator feels like its on
       b. it feels like the radiator is on
       c. the radiator feels as though it is on
       d. it feels as though the radiator is on

And a TO ME experiencer phrase interacts with the aktionsart of FEEL/P in the same way as it interacts with the aktionsart of SOUND and LOOK/P.

(104)  a. Peter feels warm (to me)
b. Peter is deliberately feeling warm (*to me) -- he wants me to think he’s ill so he can stay in bed

FEEL/P cannot have an agentive subject simultaneously with an experiencer TO-phrase.

Often, FEEL/P occurs where the experiencer of the sensation is the subject of the verb. This is true of the examples like those in (105). In this respect, FEEL/P is very different from the other verbs in the same class, and the data are due to the fact that we can feel with all of our bodies, therefore the sensation of feeling is often body-internal. The data for FEEL/P with an experiencer subject are not exactly the same as those for the other verbs in this class.

(106)  a. Jane feels cold  
       b. Jane is feeling cold

It is clearly the case that when the subject of FEEL/P is the experiencer, it can be progressive. However, there is a question of whether it can be agentive or not:

(107) ?Jane was deliberately feeling cold in order to be able to test out her hypothermia restorer kit

Even with a plausible context, (107) is only marginally acceptable.

Most of the examples with experiencer subjects pattern like the examples above. However, there are no possible examples with nouns, gradable or otherwise. It is clear that these experiencer subject examples have the same syntax as those in (104) although their semantics may be very different.

2.4.4 SMELL/P

This verb fits the same set of patterns as the others in this class: it can have an adjective, noun or LIKE/preposition xcomp; it can have a LIKE/clausal or AS
THOUGH complement, when it may have a contentful or expletive subject, and whether or not an experiencer phrase is present has aktionsartal consequences.

There is one other fact about SMELL/P which is not the same as for the verbs in this class reviewed above.

\begin{enumerate}
\item the perfume smells of flowers
\item *the theatre set looks of gardens
\item *the music sounds of vacuum cleaners
\item *the fabric feels of cord
\end{enumerate}

SMELL/P can take OF. LOOK/P, like SEEM, SOUND and FEEL/P cannot select OF as their complement. TASTE/P is the only other verb in this class which can select OF as its complement. I argue that there is a semantic account of this choice in Chapter 5.

There is a further major difference between SMELL/P, and TASTE/P on the one hand and the other verbs in this class on the other: these verbs can only have noun-phrase xcomps when the noun is an identity of sense anaphoric pronoun like ONE. The reasons for this, which are to do with class membership, are discussed in Chapter 5.

2.4.5 TASTE/P

This verb has exactly the same complementation pattern as SMELL/P. Some examples are pragmatically harder to get than others, but even agentive TASTE/P is possible in the right context.

\begin{enumerate}
\item the lizard was deliberately tasting unpleasant
\end{enumerate}

Imagine a situation where lizards are able to control how (certain disposable) parts taste in order to dissuade predators from eating less disposable parts.
2.4.6 Issues in the complementation of SOUND-class verb

There is only one syntactic issue: what is the status of LIKE/clausal and similar complements of SOUND-class verbs? In Chapter 4, I present evidence that, in some, though perhaps not all, cases, LIKE/clausal is an xcomp of the verb. The remaining issues, such as whether these are raising or control verbs, are semantic (as we saw in the discussion of whether HEAR-class verbs were raising or control predicates above). For that reason, the issues presented here are discussed in greater detail in Chapter 5. There is, however, an important question for issues of linking and the predictability of syntax from semantics raised by the discussion of these verbs in this section.

There is one important difference between the first three words in the class and the other two which suggests that the sensory modalities are not all exactly the same and that there will be semantic differences between the sensory modalities within each syntactic class. Such differences show up in different ways depending on which class is in question. We have already seen that there are major syntactic differences between LOOK/A and LISTEN; and between LOOK/A and LISTEN and the other words in the same group. We shall see in Chapter 3 that there are differences in the HEAR-class which are sensitive to collocational restrictions on certain prepositional adjuncts. We have just seen that there is a difference of complementation with SOUND-class verbs too. These facts are important in establishing that none of these classes of verbs constitutes a homogeneous group and that we may well find that there may be smaller subsets of verbs than might be initially anticipated. Such a conclusion constitutes, I think, grave problems for any theory which seeks to predict the subcategorisation of a verb from its semantic entry. There can be few smaller semantic classes of verbs than those dealing with direct physical perception; if these verbs do not constitute a single semantic group there can be little chance of identifying the semantic elements which their syntactic subcategorisation is sensitive to.
Chapter 3
The Semantics of HEAR-class verbs

3.1 Introduction
In the previous chapter, we saw that HEAR-class verbs have three main complementation patterns. They may be complemented by a direct object, by a direct object and xcomp, or by a tensed declarative clause. In this chapter, I examine the relationship between the complementation of HEAR-class verbs and their semantics. The issues include the polysemy of each HEAR-class verb, and how the different senses are related to different complementation possibilities, the semantic decomposition of the physical perception sense of these verbs, and the relationship between the semantics of a HEAR-class verb (in any of its senses) and the material it can collocate with.

The discussion of polysemy raises further issues of its own: first, it shows that as there is no direct relationship between word-class and ontological category there can be no predictive relationship between the meaning of a verb and the category of its complement. Secondly, it raises issues about how meaning should be represented. What emerges is a frame for each perceptual modality (in the sense of Frame Semantics), where a conceptual network is established around the concepts essential for an analysis of each of the verbs. I borrow the term “profile” from Cognitive Grammar. Loosely speaking, I say that a verb’s sense profiles certain parts of the conceptual network.

Valency includes both a statement of a relationship and a statement of the category of a relatum. It is uncontroversial that the word-class of the complement of a verb should not be predictable from the semantics of that verb; however, given that there is a general enthusiasm in the literature for accounting for valency patterns from the sense of a verb, this uncontroversial point is worth restating. There is some relationship between the word-class of a valent and the nature of the valency. For example, only nouns can be direct objects. If the word-class of a valent cannot be

28 I am discussing senses that are closely related to, or that involve, physical perception. There is no discussion of examples like I’ll see him hang or of idiomatic collocations like see off, see about, or see in.
predicted from its semantics, at least some of the predictability from semantics to syntax is made impossible. As far as the issue of linking is concerned, or the issue of whether syntactic valency is predictable from semantic valency (as I noted in chapter 1, these issues are not exactly the same), it is clear in this chapter that HEAR-class verbs are unlikely candidates for hard and fast linking rules. This fact makes them even less likely candidates for an account that predict syntactic valency from semantic valency.

The chapter is organised differently from the previous one. Nearly all of the discussion consists of a case-study of SEE. This is the one verb that is most widely discussed in the literature and it is the most semantically complex of the HEAR-class verbs. The other four HEAR-class verbs are discussed in section 3.7 where individual entries are given for them. Their meanings can all be accounted for in terms of the meaning of SEE.

3.1.1 An introductory sketch of SEE

Figure 3.1 represents the semantic structure of the lexeme SEE; Figure 3.2 is a diagrammatic representation of the syntactic and semantic structure of an utterance like *Jane saw Peter*. There is only one lexeme SEE, which is polysemous. While I do not change the analysis presented in the diagrams in what follows, the rest of the Chapter expands on the material presented diagrammatically below.

The convention of the diagram in Figure 3.1 is that the nodes all correspond to concepts. SEE is polysemous as I showed in 1.2.3, so the diagram captures both the concepts that correspond to the individual senses of SEE, which could be called "physical perception", "understanding" and "realising" in ordinary language, and the network of relations between them. The concepts are labelled with arbitrary names: $c$ for concept and a number which identifies each concept. Each of these concepts inherits its meaning from the node above it. I have labelled the concepts that express those meanings with words that express them in normal language.
There are five senses of SEE that can be directly accounted for by Figure 3.1; all but the third correspond to a single concept in the diagram.

- 'gazing' as in I saw to the horizon
- 'image forming' as in I was seeing stars
- 'indirect perception seeing' as in I saw in the paper that Mars was inhabited
- 'understanding' as in I see what you mean
- 'seeing is realising' as in suddenly, I saw the aromatherapist to be a charlatan

I refer to these senses as 'see1', 'see2', 'see3', 'see4' and 'see5' respectively. 'see3' is more complicated than the other meanings. It is complicated in that it involves the physical perception meaning of 'see1', yet it has the same semantic relationship to its object as 'see4'.

'see3' can be accounted for in one of two ways in the diagram in Figure 1. Either there needs to be a proposition saying that indirect perception involves all of the structure from c1-c3, tied together with a series of result links. Without the proposition, c1 denotes 'see1'. With the proposition, it denotes 'see3'. Or 'see3' is synoptic, corresponding to both c1 and c3 in the diagram. I argue the case for recognising 'see3' as a separate sense of SEE below. Given that it is a separate sense, there are some grounds for preferring the second option, which I discuss in section

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29 By 'image forming', I mean 'forming a mental image'.
3.2.2 below. All senses referred to in the text are in roman lower case type, marked out by single quotation marks.

The other element the analysis describes is the claim that physical perception seeing involves two different concepts, either of which may be the sense of an instance of SEE. This claim is argued for in 3.2.1. We saw in 1.2.3 that Jackendoff (1990) makes a good case for such a claim.

Below, I discuss the relationship of the different senses of SEE to the different complementation patterns of SEE.

Figure 3.2

Figure 3.2 is a schematic representation of the grammatically relevant elements of the meaning of physical perception SEE. It is not unproblematic, however. We see below that, despite certain observations about the nature of perception and experience which I discuss, a representation like that in Figure 3.2 is incomplete. In order to be able to account for the collocational possibilities of physical perception SEE as well as other facts about its temporal nature, it is necessary to present a further decomposed analysis of 'see1'. Much of the rest of the chapter is concerned with how the decomposition of the physical perception sense of SEE should be represented and the consequences of such an analysis.

I discuss in sections 3.2-3.2.2 how the diagram in Figure 3.1 captures all of the possible senses for SEE. The semantic model that I am elaborating here looks rather different, therefore, from that of Lakoff (1987) and Sweetser (1990), although it is still prototypist. I explain the similarities and differences between my account and those of other people as I discuss the diagram. In Chapter 4, I show how semantic
structures (duly modified for the appropriate sensory modality) like that in Figure 3.2 are present within the semantic representation of the LISTEN-class verbs. In Chapter 5, I demonstrate that the semantic structure shown in Figure 3.1 is also present within the meaning of SOUND-class LOOK, and that the corresponding diagrams for the other perceptual modalities within the HEAR-class are similarly present within the meanings of the other SOUND-class verbs.

After discussing the diagram in Figure 3.1, my next topic in this chapter is an analysis of physical perception seeing. This involves expanding the diagrammatic analysis that I have given in Figure 3.2. This sense of SEE has been widely discussed in the literature because it has an aktionsart which is difficult to account for in terms of the standard standard analyses of the English aspektual system (Brinton 1988, Jorgensen 1990, Kenny 1963, Leech 1987, Ljung 1980, Mourelatos 1978, Vendler 1967) because it raises issues in the usual accounts of force-dynamics (Croft 1991), and because it is problematic in terms of localism (Gruber 1967, Van Develde 1977, Goldsmith 1979). The issue of the semantic relations of 'see1' has in general been hard to resolve, whatever strategy has been brought to bear on it.

I handle these problems in the semantic analysis of 'see1' by taking a new tack. Rather than trying to constrain 'see' to a model that deals in terms of prototypical verbs of action or causation, as in force-dynamics, or a model that deals in terms of motion, as in the various localist accounts, I claim that verbs of perception are special precisely because they are directly embodied and experiential. It is more interesting to ask how and why they do conform to the usual models of analysis rather than why they do not. It would be surprising, in my view, if these verbs conformed prototypically to a model of analysis like localism or force-dynamics at all. As basic level categories, the senses of the HEAR-class verbs are unique: there is no natural reason to assume that notions of movement and causation, which have been elaborated for verbs in other semantic fields, should be at all appropriate here. After all, we only become aware of motion and causation via perception, so in this sense, perception is even more basic. What we find, in fact, is that there are some elements of force-dynamic and localist meaning in the physical perception meaning of SEE, but they are not encoded in the same way that you find in verbs of motion or causation.
The linguistic expression of perception is conditioned by the experience of perception. There are two important elements in the experience of perception. One is that the nature of perception varies with the percept. If I see an explosion, the duration and intensity of the experience is limited by the duration and intensity of the explosion. If I see the Himalayas, the duration of the experience is potentially limitless. For as long as I am orientated towards the mountains and there is no obstacle between them and me, I should be able to see them. The other is the physicality of perception, the fact that it is directly embodied, which causes the perceiver's body to constitute another constraint on perception. However, unlike walking, perception is not something that I actually do with my body. Our folk understanding of perception need not have the same thematic structure or the same force-dynamic nature as our folk understanding of walking. Wierzbicka's (1980) account of perception verbs is firmly located in notions of embodiment.

These facts help explain why SEE has a strange aktionsart. It is odd that SEE cannot occur naturally in either the simple present or the progressive present when it has a physical perception meaning. Barring verbs of physical perception, every verb in English can be one or the other when it refers to a present instance of the sense of the verb. I explain below that this problem is accountable in terms of the dynamicity of HEAR-class verbs. I discuss dynamicity and the aktionsart of the physical perception sense of SEE in section 3.5.1 below. Aktionsart is a strictly semantic phenomenon.

3.2 The senses of SEE

In this section, I discuss the evidence for the claim that SEE is polysemous. I then explain how Figure 1 captures a number of the possible senses of SEE.

It is not, a priori, obvious that SEE is polysemous. What is more, the difference between direct and indirect perception raises particular analytical problems. There are two possible views: (i) that the sense of SEE is stable across all of the different complementation patterns and the different interpretations are context dependent; (ii) there are different senses of SEE. The first view is maintained by authors like Kirsner and Thompson (1976) and Tobin (1993). As should be clear
from Figure 1 and the brief discussion surrounding it, I maintain the second view.
These issues are also discussed in Caplan (1973).

The sense of SEE varies with the ontological category of the referent of its object. If the complement has a proposition as its referent, the sense of SEE cannot be the physical perception sense. If the complement has a situation or a thing as its referent, the sense of SEE is the sense which relates to direct perception. As a noun can have a proposition, situation or thing as its referent, the sense of SEE cannot be predicted from either the grammatical relation between the instance of SEE and its complement, or from the word-class of the complement of the instance of SEE. The examples in (1) demonstrate this point.

(1)  
   a. I saw your point of view
   b. I saw the explosion
   c. I saw the wine stain on the carpet

There are at least two senses of SEE that are at issue in the examples in (1). (1a) need not involve the eyes at all. It need not involve any element in the semantics of physical perception, and it simply relates that I understood your point of view. I could utter (1a) about a context where you and I were listening to Bach in the dark, and you were explaining to me why you preferred Romantic music to Baroque music. (1b-c) on the other hand necessarily involve some element of physical perception. Talking of physical perception (as opposed to, say, dreaming) I cannot say I saw the explosion with my eyes shut. The only variable in the sentences in (1) is the ontological status of the referent of the direct object. It is, therefore, uncontentious to claim that SEE must have (at the very least) more than one sense and that one of the indicators of the sense of SEE is the ontological status of its direct object. The different meanings of the instances of SEE in (1a-c) are not due to the grammatical status of the direct object.

It might be argued that the different meanings of saw in (1a-c) are not linguistically cued, as the ontological status of the object is not linguistically cued. However, there is further evidence that two senses of SEE are involved here. If the
examples were in the present tense, only (1a) would be able to occur in the simple present felicitously. This follows automatically from an analysis of SEE as a polysemous verb where the sense of saw in (1a) inherits all of its meaning, including its aktionsart, from ‘understand’.

The other question that I am concerned with is how the senses of SEE are related and how they relate to an account of physical perception. Any discussion of the meaning of SEE which involves physical perception is relevant to this thesis, so an analysis of the relation between direct and indirect perception is highly relevant. I am not, beyond the exemplary purposes of the examples in (1), concerned with ‘see4’ or ‘see5’.

As I remarked above, the WG prototype for perception does not look like Lakoff’s radial categories. Lakoff (1987) distinguishes between Idealised Cognitive Models (ICMs) and radial networks which connect ICMs. Both ICMs and radial networks account for prototype effects and radial networks are also important in modelling polysemy. According to such an account, there would be a number of different senses of SEE each of which would have its own prototypical structure. These, in turn, would be connected in larger prototype structures. The links and mappings between senses would then be motivated by, for example, metaphor. In my account, there are many nodes and relations in conceptual structure and what differentiates the senses of SEE is the number of nodes and relations that are present for any given sense. I call the mechanism which identifies the particular nodes and relations for a given sense “profiling”.

WG’s answer to the problem of prototype effects is to use a system of default inheritance (Hudson 1990: 30-52). By default, the sense of SEE is a ‘see1’; the other senses override the default. I claim that ‘see1’ is the prototypical sense of SEE. There is some evidence for this in that it is the first sense acquired by a child.

3.2.1 ‘see1’
In Figure 1, I claim that there are at least two elements which make up the physical perception senses of SEE. The evidence that there must be two independent sub-parts of ‘see1’ includes Jackendoff’s (1983: 150-1, 1990: 36) claim that there must be two
elements in the sense of this word. I discussed that claim in 1.2.3 and review it here. He says that there must be a ‘gazing’ element, where the see-er’s gaze makes contact with the percept and there must also be a mental representation of the percept. The examples in (2) show that either part of the semantic structure of ‘see1’ can be missing. These examples were first discussed in 1.2.3.

(2)  
   a. Bill saw Harry  
   b. Bill saw a vision of dancing devils  
   c. Bill saw a sign but he didn’t notice it at the time  
   d. *Bill saw a vision of dancing devils but he didn’t notice it at the time  
[=Jackendoff’s (25); his judgements]

In (2a) there is an example of prototypical physical perception. In (2b) there is an example where the referent of the subject has a mental image of something which is not physically present. However, (2b) refers to a mental image, not a belief, state of knowledge or state of comprehension. In (2c), the prototype of physical perception, involving both ‘gazing’ and ‘image forming’ is overridden and only the ‘gazing’ element is present. The BUT-clause shows that the element of forming a mental image of the percept is missing. (2d) shows that forming a mental image of something necessarily involves being aware of the representation of the percept.

Jackendoff (1990) uses these facts to argue that the physical perception sense of SEE must be organised as a prototype and that there are no necessary and sufficient conditions of seeing. In a prototypical ‘seeing’ situation, both elements are present but either element can be missing from the sense in any given instance. In (2c) the sense of saw is c1 (an instance of ‘gazing’), in terms of the diagram in Figure 1, but the normal default, that the gazing has a result, is overridden. In (2b) the sense of saw is c2 (an instance of ‘image forming’) and the default where the sense of SEE is c1 is overridden. The fact that either of the two concepts c1 and c2 can be present alone as the meaning of SEE is enough to identify them as separate senses of SEE. However, there is further evidence that c1 and c2 are potentially different senses of SEE.
The analysis of the sense of saw in (2b) as a non-prototypical sense of SEE, which is not an instance of 'gazing', gives us a potential answer for the question why examples like (2b) can be progressive when they are present tense although other instances of SEE with the physical perception sense cannot. The reason is simply that the sense of (non-prototypical) saw in (2b) is a sense similar to 'image forming'. The verb IMAGINE can occur in the progressive when it is present tense. As the sense of saw in (2b) lacks the 'gazing' element, it lacks the element of the sense of SEE which is problematic in terms of its aktionsart and so it can occur in the progressive when it is present tense because it is an instance of a mental activity and not of physical perception. Its aktionsart is not constrained by the physical limitations that usually affect the aktionsart of HEAR-class verbs.

Prototypical instances of SEE, such as (2a), look like the diagram in Figure 3.2. We can show how (2b) and (2c) differ from the prototype in a similar diagrammatic fashion. Figure 3.3 presents the representation of (2b).

![Figure 3.3](image)

In this, the sense of saw is an instance of image formation only; there is no gazing element. This is a non-prototypical instance of SEE. Figure 3.4 represents (2c).
Figure 3.4

In this case, the result link is missing and consequently there is no 'image forming' element present.

The two-part analysis of prototypical physical seeing captures not just the facts implicit in Jackendoff’s data. It also reduces the problem of the aktionsart of SEE to a problem in one sub-part of the semantic structure related to seeing: the problem only arises when the sense of SEE is an instance of gazing -- c1 in Figure 3.1.

There are problems with Jackendoff’s analysis of the physical perception sense of SEE. He does not establish what ‘gazing’ is and he does not explain why physical perception seeing appears to have a theme. It is these problems that I address in section 3.3.2.

3.2.2 ‘see3’, ‘see4’ & ‘see5’

I treat these senses together because they are closely related. ‘see4’ is the sense of see in (3a); ‘see3’ is the sense of see in (3b). The example in (3c) shows that HEAR has a sense like ‘see3’.

(3)  a. Jane saw that Peter was right and mummy was wrong
     b. Jane saw in the paper that the government was on the ropes
     c. Peter heard from mummy that Jane is in line for promotion

‘see5’ is the sense of saw in (4a-b).

(4)  a. Peter suddenly saw that his whole life was a mess
b. after being blinded, Gloucester saw Lear's daughters to be evil

The main difference between the examples in (4) and those in (3) is that the examples in (4) involve a change of state whereas the examples in (3) are stative.

The main evidence that the examples in (3) and (4) involve an 'understanding' concept is the fact that the referents of their complements are propositions. While these senses may always have propositional ees, it is not the case that any third-order entity (in Lyons' 1977 sense) will do. For example, *I see a way out/ the picture/ the difficulty/ a problem* are all fine, assuming a metaphorical interpretation of *a way out* and *the picture*, but they seem to be, if not idioms, regular collocations. *I see your idea*, which should be alright if any third-order entity could be the ee of these senses, is unacceptable. As THAT-clauses always refer to a proposition, THAT-clauses tell us that all of the examples in (3) involve senses that have ees which refer to propositions.

As I discussed in section 3.2.2, in the account of the examples in (1), it is clear that any perception verb whose sense requires a propositional ee cannot simply involve physical perception. Verbs whose senses can have propositional ees include BELIEVE, KNOW, UNDERSTAND, and REALISE. There are certain similarities between the behaviour of SEE when it has a sense with a propositional ee and UNDERSTAND that lead to the conclusion that the sense of SEE in these cases is the same as the sense of UNDERSTAND.

First, SEE, REALISE, KNOW, and UNDERSTAND are all factive, in distinction to BELIEVE, as the examples in (5) show.

(5) Don't you see/ realise/ know/ understand/ ?believe you're in danger?

The evidence that the examples in (3) involve an understanding concept rather than a knowing one, given that both understanding and knowing are factive, is that the verb UNDERSTAND provides the best paraphrase of this sense of SEE in examples like

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30 Sections 3.2.3, 3.2.4 and 3.2.5 below provide the justification for the claim that propositional ees are relevant to an analysis of the sense of SEE.
Jane understood that Peter was right and mummy was wrong, which paraphrases (3a) and I understand from what I read in the paper that the government is on the ropes which paraphrases (3b). As, in addition to factivity and paraphrase, 'see4' (the sense of (3a)) has the same aktionsart as 'understand', I take it that 'see4' is an instance of 'understand'. There is a structure diagram of (3a) in Figure 3.5.

![Figure 3.5](image)

The diagram states that the sense of see is an instance of 'understand'. The aktionsart of see and the requirement that the referent of the complement of see should be a proposition follow from this fact.

That 'understand' and 'see4' are instances of the same concept clarifies one issue. However, I still need to sort out 'see5' and 'see3'. 'see5' is the more straightforward of the two: it is the same as 'realise'. The semantic structure for the lexeme REALISE is given in Figure 3.6.

![Figure 3.6](image)

The diagram states that c1, which could be called 'realise' as the sense of REALISE, is a change of state whose end result is a state of understanding. The same semantic structure is appropriate for SEE in examples like Peter suddenly saw the
aromatherapist to be a fraud and suddenly, he saw that he had wasted his time at university. There is an example in Figure 3.7.

\textbf{Figure 3.7}

In Figure 3.7, the sense of \textit{saw} (‘see5’ in terms of Figure 1), is a change of state which has an instance of ‘understand’ as its result state.

This leaves ‘see3’ to be accounted for. What are the grounds for drawing a distinction between ‘understanding’ \textit{SEE} when the understanding is on the basis of visual evidence and ‘understanding’ \textit{SEE} when it is not, given that they both have the same kind of complement? I have only claimed so far that the sense of \textit{saw} in (3a-b), repeated here as (6a-b), involves understanding.

(6)  
a. Jane saw that Peter was right and mummy was wrong  
b. Jane saw in the paper that the government was on the ropes

There are two options: the first is that (6a-b) involve only one sense of \textit{SEE}; the second is that there are two senses of \textit{SEE} that can have a propositional complement and that there are linguistic ways of differentiating them. We can see, from the examples in (7), that there is evidence that the examples in (6) involve different senses of \textit{SEE}.

(7)  
a. Jane saw that Peter had crossed the road safely through the window  
b. Jane saw that Peter was right through the window  
c. Jane saw in his report that Peter had been bad because she wanted to
Jane saw that Peter was bad because she wanted to cause trouble

(7a) shows that a directional preposition can be used with the physical sense of seeing but it cannot when SEE only means ‘understand’. On the other hand, (7c-d) show that there are other differences between ‘see3’ saw and ‘see4’ saw. The because she wanted to cause trouble clause in (7c-d) can only relate to an action, it cannot relate to a state of comprehension. (7d) is, therefore, entirely unacceptable. To the extent that (7c) is alright, it is because physical perception can be construed as an action with some kind of purpose.

There are three possible ways of capturing the relationship between ‘see3’ and the other senses of SEE. The first is to claim that the sense of saw in (6b) is c1 in Figure 1, and that c1 has c3 as its result. We can discount this alternative automatically because saw in (6b) does not share its aktionsart with seeing of physical perception. It is hard to get (6b) in the present tense, but an example like *I see in the paper that the government is on the ropes* shows that when SEE has this physical perception + understand sense, it has the same aktionsart as ‘see4’.

The second alternative is to claim that the sense of saw in (7a) is like the diagram in Figure 3.8.

![Figure 3.8](image-url)

This diagram claims that the sense of saw is the same as ‘see4’ but that, unlike ‘see4’ it also invokes, or brings in other elements of the vision frame. This account is unsatisfactory from a theoretical perspective, because it just takes the result as the
sense of an ordinary transitive verb. We shall see verbs defined by their results in Chapter 4, but they are copular verbs, with quite extraordinary semantics.

My preferred alternative is to say that the sense of saw in (7a) is shown in Figure 3.9.

![Figure 3.9](image)

This diagram claims that 'see3' is synoptic and that the sense of saw is simultaneously c1 and c3 from Figure 1. The advantages of this account are that the aktionsart of c3, by virtue of being more specific overrides the aktionsart of c1, giving 'see3' the same aktionsart as 'see4', because it is more specific than the aktionsart of 'c1'. At the same time, the fact that there is a physical perception element in the sense of saw is captured: it is this that permits the because clause of (7c). Finally, there is no need for innovations such as defining transitive verbs by their results. A synoptic sense can be accounted for in a straightforward way by saying that the sense 'see3' is a both c1 and c3; a sense that invokes other parts of semantic structure is unconstrainable.

There is now enough information for us to explain the ambiguity in examples like (8).

(8) Jane saw that she was driving too fast

(8) is ambiguous in three ways. The meaning of saw could be that Jane had visual evidence that she was driving too fast, or it could be that Jane understood that she was
driving too fast, or it could be that Jane realised that she was driving too fast. This is precisely the kind of ambiguity that I would expect in cases where there is a prototypical structure that has a series of alternative defaults. I consider it an advantage of the system that I have sketched here that we can capture the relationships between the different senses of SEE at the same time as capturing what makes the various senses of SEE different from one another. It is the interaction of a relatively simple semantic network, like that in Figure 1, the idea that the different senses of SEE profile different elements in the structure of Figure 1 and default inheritance as a mechanism for capturing prototype effects that has made this analysis possible.

One semantic dimension that I have not mentioned in looking at the semantics of HEAR-class verbs is the kind of judgement involved and the degree of personal involvement of the subject. This is a factor which Borkin (1973) discusses in the context of FIND and I think that it is relevant here. Borkin found that FIND changed its meaning depending on its complement. There are examples in (9).

(9) a. I find that this chair is uncomfortable
    b. I find this chair to be uncomfortable
    c. I find this chair uncomfortable

Borkin claimed that (9a) was appropriate if the judgement was arrived at through some kind of empirical endeavour, such as consumer sampling, and checking through consumer reports. She found that (9b) was appropriate if the subject of the sentence ran the consumer tests themselves and she found that the final example was appropriate if the subject of the sentence finds the chair uncomfortable through personal experience.

These claims about FIND are relevant to the analysis of HEAR-class verbs for two reasons. First, (9c) is a case of directly embodied experience. Secondly, we can see that different complement types can behave differently as far as the degree of personal involvement in the experience is concerned, although all of the complements in (9) have propositions as their referents rather than situations. The question is how come (9c) is more personal than (9a) when the differences between them appear to be
syntactic rather than semantic. It is a nicely iconic effect, however, and I shall explore
the differences between situations and propositions, and more and less personal
judgements in the next section.

3.2.3 Propositions and situations
So far in the analysis of the different senses of SEE, I have just asserted that some
complements are situations and others are propositions. This assertion has been used
as the basis for establishing the claim that there are different senses of SEE. I should
like to explore the claim that there are substantial differences between propositions
and situations and I shall identify how they differ. This discussion raises the question
of whether different kinds of xcomp are associated specifically with either
propositions or situations.

Hudson’s (1990: 75-83) ontology suggests that events are instances of things
and that this identification is linguistically relevant because IT can refer to an event.
So in (10) *Peter cross the road* must be a thing because IT can refer to it.

(10) Jane saw Peter cross the road and mummy saw it too

Unfortunately, this criterion does not distinguish situations from propositions because
propositions can be referred to by IT as well.

(11) Jane believed that Peter was charming and mummy believed it too

We should expect this: after all, propositions can be the referents of nouns. The
difference between situations and propositions must be that situations, like physical
entities, have a physical manifestation whereas propositions do not have any kind of
physical presence at all although in an isa hierarchy both are instances of things. One
of the factors that makes a situation have a physical presence is that it exists in time.
Another is that it occurs in space. A proposition does not have a place or a time.
There is one other difference between propositions and situations: although both
propositions and situations can have an internal temporal structure, the internal
temporal structure of propositions is not visible to their heads whereas there is a direct relationship between the temporal structure of the referent of a dependent which is a situation and that of the sense of the head. I elaborate on this point in my discussion of ‘see1’ with situational xcomps in section 2 below.

(12) shows that an xcomp which refers to a situation has a time, indicated by at 9 pm, a place which is indicated by right here, and it also has an internal temporal structure. The significance of the internal temporal structure is that in (12a) the event of seeing lasted for the duration of the event of crossing but in (12b) the event of seeing only lasted as long as part of the event of crossing, present participles being partitive.

(12)  
a. Jane saw Peter cross the road at 9 pm, right here, all on his own  
b. Jane saw Peter crossing the road at 9 pm, right here, all on his own

The referent of the xcomp -- a situation -- is different from a proposition in that what is inside a subordinate clause that has a proposition as its referent is entirely irrelevant to the main clause. The important matter is whether there is any temporal relationship between the referent of the subordinate clause and the sense of the head verb. The internal temporal structure of the subordinate clause in (13) is irrelevant.

(13) Jane saw that Peter was crossing the road

Although (13) clearly has internal temporal structure in that the complement of that is a tensed verb in a particular aspectual construction, that internal temporal structure is irrelevant to saw. The examples in (14) show that this difference between a proposition and a situation can be brought out very clearly. Although that we crossed the road is the extraposed subject of took in (14c) and although there is, as (14a-b) show, no problem in relating a crossing situation to a time taking situation, (14c) is ungrammatical because the sense of took cannot look at the temporality within that we crossed the road.
(14)  a. crossing the road took 30 seconds  
     b. it took 30 seconds to cross the road  
     c. *it took 30 seconds that we crossed the road  

It is not the fact that there is an extraposed clause which is co-referential with the subject of *took that makes (14c) ungrammatical. (14b) shows that as long as the extraposed clause has a situation as its referent this kind of structure is fine. (15) shows that as long as the main verb is semantically compatible with a subject that refers to a proposition it is alright for there to be extraposition of a THAT-clause which refers to a proposition. The significant point appears to be that propositions as entities are not things with a physical manifestation and they are not things whose internal temporal composition affects their manifestation.

(15)  it scared me that we crossed the road

Despite Hudson's (1990) claims, these facts show that the referent of a propositional THAT-clause cannot just be the situation referred to by its tensed verb. If it were this situation there would be no difference between proposition and situation in terms of whether the head of the situation or proposition could be sensitive to the internal temporal structure of the situation of proposition. (The issue of what the relationship between a proposition and its represented situation might be remains an open research question beyond the domain of this thesis.)

We can take the facts that I have just outlined as being the reason why in sentences like (16) there is no conflict between the two time adverbials and the two place adverbials.

(16)  Jane saw that Peter crossed the road here at 5 pm in her office at 7 pm

The whole of *that Peter crossed the road here at 5 o'clock exists atemporally, and can be the content of a belief or a state of knowledge.
These are the reasons why Lyons (1977: 443-446) calls propositions third-order entities. The nature of these entities is different from that of things and events. Crucially, things and events exist in space and time, whereas propositions do not because their only existence is a mental one. It is precisely this difference that shows that in the case of 'see3' and 'see4' the relationship between the sense of the verb and the referent of the complement of the verb has to be mediated by a node which is an instance of 'understand'. What is selected by these senses of SEE is a proposition by all of the criteria that I have outlined here.

3.2.4 Propositions, and presupposition and assertion

The difference between situations and propositions is not the same as the relation of presuppositions to assertions. As I show in the next section, whether an instance of SEE has a proposition or a situation as its ee, the existence of the situation or proposition is presupposed, not asserted. Both the matter of whether a subordinate clause (taking a broad view of subordinate clauses) has to refer to a situation or a proposition and the matter of whether a subordinate clause is asserted or presupposed have to do with the semantics of their heads. But they are consequences of different aspects of the semantics of their heads. The issue of whether a subordinate clause has to refer to a situation or a proposition is a matter of selection. The issue of whether something is asserted or presupposed is related to questions of meaning and use. Levinson (1983: 181-185) adduces a list of "presupposition triggers" which include heads that take THAT-clause propositional complements, like REALISE and KNOW as well as verbs that have xcomps which refer to situations as their complements, like STOP and BEGIN. That is to say that the referent of the subordinate clause in the following examples is assumed to be presupposed by the speaker of the utterance:

(17) a. Jane realised that Peter was in debt
    b. Peter knew that he was in debt
    c. Jane stopped beating Peter
    d. Peter began beating Jane
Therefore the speaker of (17a) presupposes that Peter is in debt; the speaker of (17c) presupposes that Jane beat Peter. The relevant point to my concerns is that the notion of presupposition is orthogonal to the differences between propositional and situational complement types. A subordinate clause with either a situation or a proposition as its referent can be presupposed.

3.2.5 Perception and the truth of the percept

This issue here is what Barwise and Perry (1983) call “veridicality”. Their discussion is criticised in Lakoff (1987), which I sketch below.

Prototypically, we believe what we see and what we see actually happens. Hence the metaphor “seeing is believing”. However, it is possible to see things that are not actually so. Barwise and Perry assume a model which states that if you see x then x. Lakoff’s discussion demonstrates that it is possible to see things that are not and consequently the default assumption that what we see is what has happened is not the case in all circumstances. Lakoff’s example involves two lights flashing onto a screen. If you see two lights flashing at an interval of a few inches, it is possible to see the light travelling across the screen. A viewer may see a light travel across the screen, but what actually happens is that two lights are flashing.

Lakoff is not entirely right, however, to draw linguistic conclusions from the possibility of there being optical illusions. It is true that it is possible to be deceived, but sight is the most reliable form of evidence that we ever appeal to. Lakoff’s discussion of our being deceived by our eyes relies on the fact that things can happen in the physical world faster than our eye and brain can process them. But we do not have to look to the perception of situations to find examples of our being deceived by our eyes. It is possible for us to be make categorisation errors on the basis of visual impressions. I once mistook a skunk for a cat, with potentially disastrous consequences. The famous “duck/rabbit” figure discussed in Jackendoff (1983: 25) is another example of a situation where it is not necessarily true that a perceiver has seen what is actually represented.

The idea that you see what there is to see is discussed in Kirsner and Thompson (1976: 212-216) as implicativity. It is related to the factivity of SEE. It is
clearly part of the modality of SEE that in all cases what is seen is not necessarily what is there. These issues are also discussed in Wierzbicka (1980) and have, she points out, drawn a lot of attention in the philosophical literature (for example, Ryle 1949). Barwise and Perry’s (1983) account draws on Barwise (1981) which is criticised from within the terms of formal semantics by Higginbotham (1983).

3.2.6 Complement types and propositional referents
I have claimed that whether the referent of the complement of an instance of SEE is a proposition or a situation is not predictable from the syntactic relation or the categorical status of the complement. It is the case that direct objects could be things, situations or propositions. There are, however, certain regular correspondences. THAT-clauses can only refer to propositions. Xcomps which are present participles can only refer to situations. Xcomps which belong to other parts of speech, however, can refer to either situations or propositions. The ontological status of the referent of these xcomps is not encoded in the xcomp itself. It is instead conditioned by the semantics of the head. If we compare SEE with WANT, it is clear that they can have xcomps with the same form although these xcomps have a situation as their referent with WANT and a proposition as their referent with SEE.

(18) a. I want Peter to be a good boy
   b. I saw Peter to be a good boy

Propositions can be paraphrased by the proposition that... and situations can be paraphrased by the situation in which... if we paraphrase the examples in (18), it is clear that the xcomp in (18a) refers to a situation and the one in (18b) refers to a proposition. As a working assumption, the referent of an xcomp is, by default, a situation in all circumstances, but some heads override the default to modalise the situation into a proposition. Those heads include precisely the class of presupposition triggers discussed in the previous section.
3.2.7 Conclusions

In this first section, I have outlined the network in semantic structure which is needed to account for the different senses of SEE. This was presented in Figure 1. I have accounted for the differences between physical perception and indirect perception in terms of the ontological status of the complement of SEE and I have accounted for the differences between ‘see3’, ‘see4’ and ‘see5’ as well as the differences between ‘see1’ and ‘see2’. I have shown that there are linguistic corollaries to the distinction between propositions and situations and that the distinction has a status beyond the differences that it points up in the semantics of these verbs. The facts about situations and propositions have supported the analysis of SEE as a polysemous verb with its senses organised in a prototypical structure although the nodes and relations which are profiled in semantic structure are shared by the different senses in some instances. Indeed this last conclusion demonstrates exactly how I should expect a prototype to be structured.

I have now concluded the analysis of semantic relatedness that Figure 1 represents.

3.3 Wider semantic issues in the analysis of seeing

In this section, I am concerned with matters like aktionsart, force-dynamics and thematics. I am, on the whole, concerned with ‘see1’ but I shall allow the discussion to extend to the other senses of SEE if there is a relevant point to be made. Figure 2 and the discussion in 3.2.1 have shown that there are two main elements in physical perception: one is ‘gazing’ and the other is ‘image formation’. In this section, I am concerned with the relationship between the two and other elements in the semantics of seeing. This section will, therefore, present an elaboration of the semantic diagram in Figure 3.2.

3.3.1 Figures 3.1 and 3.2

Neither of the concepts I have included in the analysis of the meaning of ‘see1’ is the prototypical sense of any word. In section 3.2.1 I justified decomposing ‘see1’ into c1 and c2 in Figure 3.1 on the basis that this accounted for the prototype of seeing that
Jackendoff (1983, 1990) discusses. We shall see, however, that while the claim that 'see1' profiles both 'gazing' and 'image forming' can account for the prototype effects that we find with 'see1', we need an elaboration of the semantic structure to account for other elements in the semantics of seeing.

The specific problem is that c1 in Figure 3.1, 'gazing', has to be decomposed further. The fact that 'gazing' has to be decomposed is established by the relationship between 'gazing' and 'image forming'. It is clear that the entity which is the ee of 'gazing' cannot be the ee of 'image forming' because they each have a different ontological status: the ee of 'gazing' is the referent of the physically manifest thing which is seen; the ee of 'image forming' is the mental representation of that thing. We clearly have to find how we get from the one kind of ee to the other; more specifically, we need to account for how the image gets to be inside the mind of the see-er. That is, a gaze is something that goes from the see-er to the percept; but the mental representation of the percept goes the other way.

It is this discussion that requires the decomposition of 'gazing'. In order to account for the fact that 'gazing' is something that the see-er does, we need a node which involves the referent of the subject directing their attention to the percept. But we also need a node to capture the idea that information travels from the percept to a place within the perceiver. As I shall show in the next section, there is grammatical evidence for decomposing 'gazing' into two nodes and these nodes are particularly useful in accounting for the behaviour of 'see1' with directions. I present a more elaborate semantic structure for 'see1' in Figure 3.10. As I demonstrate below, the elements shown in Figure 3.10 are linguistically cued.
There are other arguments for splitting 'gazing' into two parts. The analysis helps identify problems in the aktionsart of 'see1' and it helps explain the force-dynamics of 'see1'. We shall see in Chapter 4 that LISTEN-class LOOK profiles c1 without profiling any of its results. These facts, as well as the thematic facts, support the analysis of Figure 3.10.

In the next section I look at the thematics of 'see1' in greater detail.

### 3.3.2 The thematics of SEE

There are two good reasons for looking at the thematics of HEAR-class verbs.

- HEAR-class verbs can collocate with prepositions in their spatial uses. For example, it is possible to say *Jane saw under the table*. The thematic relations hypothesis as formulated in works like Gruber (1965, 1976), Jackendoff (1972, 1983, 1987, 1990, 1991) and Pinker (1989) -- as well as other work done in the spirit of localist enquiry like Anderson (1971, 1977) and Miller (1985) and the work of those linguists who investigate certain localist properties of language like Bennett (1975),

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31 In this diagram, "bp" stands for body-part. In Figures 3.16-3.19, I use this relation to distinguish between the different sensory modalities.
Lakoff and Johnson (1980), Langacker (1987, 1991), Lyons (1977), Miller and Johnson-Laird (1976) and Talmy (1983) -- suggests that useful generalisations can be formed by looking at how verbs interact with spatial expressions. There is, especially in Jackendoff's work, a desire to establish formal parallels across different semantic fields so that verbs which are stative, and which refer to, say, orientation can be analysed in the same terms as more obvious verbs of motion. Work in this tradition is impressive: there is a body of good results which have indubitably established that there is a significant localist element in conceptual structure.

- The thematics of SEE have been a matter for debate in the literature, for example in papers such as Gruber (1967), Van Develde (1977) and Goldsmith (1979). Gruber claims, and his claim is supported by Goldsmith, that SEE is a verb of motion. VanDevelde argues against this position. Jackendoff (1983, 1990) accepts the Gruber/Goldsmith analysis. I argue for a version of the Gruber/Goldsmith analysis below.

In this section, I examine the localist nature of 'see1' and therefore test the Gruber/Goldsmith claim. I show that there are no verbally expressed candidates for the theme of seeing and, therefore, given the collocational properties of SEE, 'see1' must have an unstated theme. Furthermore, I show that there are two possible candidates for the theme of 'see1' and that this fact demonstrates that the analysis of Figure 2, which decomposes 'gazing' into two sub-parts is, in principle, correct.

I argue that 'see1' has certain thematic elements as part of its sense but that it is in no way a prototypical verb of motion for the simple reason that the directly embodied experience of perception does not involve the actual motion of a theme-entity. I claimed in 3.1 above that we become aware of motion and causation through perception, perception being, therefore, in some sense more basic than motion and causation. This observation does not mean that perception excludes elements of motion and causation from within its meaning but it does mean that any occurrence of those elements would be non-prototypical. The building blocks of thematic relations are verbs with meanings like 'go'. The fact that 'see1' can collocate with spatial
prepositions certainly tells us that there is a thematic element to its meaning but the linguistic expression of our experience of seeing only partly involves notions of spatial organisation. Furthermore, HEAR-class verbs are idiosyncratic in the way in which they encode localist elements.

Spatial prepositions entering into constructions with SEE present two analytical problems. The first is their syntactic relation to the verb. There is evidence that spatial prepositions can be either adjuncts or complements. The second concerns the kind of spatial relationship that they encode. Spatial prepositions can encode either directional meanings (like TOWARDS) or locative meanings like (in as in in the box). In section 3.3.2.1, I make the case for a thematic analysis of ‘see1’, and in section 3.3.2.2, I examine the representation of the themes of ‘see1’ in semantic structure.

3.3.2.1 The themes of ‘see1’

Simple collocational evidence tells us that ‘see1’ has a thematic element in its meaning: Jane saw into the room, Peter saw through the keyhole, Jane saw Peter undressing through the keyhole are all evidence that there is a theme of seeing. In this section, I am concerned with identifying the semantic nature of the thematic content of ‘see1’. Gruber (1967) shows that both ‘see1’ and the sense of LOOK/A have a theme, and he shows that SEE and LOOK/A collocate with different prepositions. The different prepositions that these two verbs collocate with can tell us something about the character of the theme of each of the verbs. My concern here is to identify the characteristics of the theme of ‘see1’. Prefiguring the discussion in Chapter 4, I assume that there is a theme of the sense of LOOK/A and that the theme of the sense of LOOK/A is not the same as the theme of ‘see1’.

The first point is that the theme of ‘see1’ has to reach the endpoint of its path; the second is that the theme of ‘see1’ has to be distributed along, and be co-extensive with, its path; the theme of ‘see1’ is similar to the theme of ‘reach’ (the sense of REACH). Neither of these facts is a consequence of a stipulation on the theme of ‘see1’. It is the first fact that leads Langacker (1991: 304) to wonder whether the sense of ‘see1’ is grounded in the metaphor “seeing is touching”. It is the second
point that makes the theme of 'see1' like the theme of the sense of GO when GO means 'extend.' The examples in (19) compare GO/travel and GO/extend with 'see1'.

(19) a. Peter went from London to Manchester
    b. the old Roman road went from London to Manchester
    c. Jane saw to the end of the fence

The er of the sense of *went* in (19a) is a theme which traverses all of the points of the path from London to Manchester sequentially and the er of the sense of *went* in (19b) traverses all of the points of the path simultaneously. It is clear that SEE is more like GO/extend than it is like GO/travel: the theme of the sense of SEE traverses all of the points of the path simultaneously.

Distributed themes, like the theme of the sense of *went* in (19b) are usually associated with stative verbs. If the sense of the verb isa state and the er of the verb isa theme, the theme of the verb is distributed along the path as in (19b). However, this does not work for 'see1'. The sense of the verb may or may not be an instance of a state: the aktionsart of 'see1' is a notorious problem, which we return to in section 3.5.

Although the theme of 'see1' has certain elements in common with the er of GO/extend, there are differences. The theme of the sense of GO can go *towards* something without reaching it. The theme of 'see1' has to make contact with its reference object.

(20) a. the road went towards Ely
    b. Jane saw towards Ely
    c. the road reached towards Ely

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32 For notational convenience, when a verb is polysemous I use a front-slash and the name of the sense of the verb to distinguish the senses. Therefore, GO with the sense of 'extend' is GO/extend and GO with the sense of 'travel' is GO/travel.
(20b) is unacceptable because *towards* merely encodes the orientation of the theme in terms of the reference object. The reference object is not on or at the end of the path, instead it is at a point that would be on the path if the path were extended so far.

`see1` involves contact whereas `go/extend` does not.

Themes may be bounded or unbounded, and can traverse either bounded or unbounded paths. The difference between the theme of the sense of GO/travel and the theme of the sense of GO/extend is one of boundedness. The theme of GO/travel is bounded, that of GO/extend is not. In both cases, the paths may have endpoints or not. The examples in (19) show simply that `see1` has an unbounded theme, not that the theme of see is obliged to contact the percept. (Any sense that the theme is bounded is therefore due to the path being bounded.) Whether or not a theme makes contact is not due to the characteristics of the theme; it is due to whether the verb stipulates contact or not. Verbs of contact that have themes, like LICK or SMEAR cannot collocate with TOWARDS irrespective of whether their theme is bounded, as is the case with LICK, or unbounded, as is the case with SMEAR.

(21)  a. Jane licked from the top to the bottom of the ice-cream
    b. !Jane licked towards the bottom of the ice-cream
    c. Peter smeared mud from the top to the bottom of the wall
    d. !Peter smeared mud towards the top of the wall

In (21) the theme of the sense of *licked* is bounded and the theme of the sense of *smeared* is unbounded. However, both verbs are equally unacceptable with TOWARDS because they are both verbs of contact. We can be certain, therefore, that the data in (20) are due to the fact that SEE is a verb of contact.

Returning to (19), it is possible to see that there is a correspondence between unbounded themes as the referents of subjects and stativity. There is a sense in which unbounded themes cannot be the er of a dynamic situation unless they are the agonist of that situation. It is possible for bounded themes to be the er of a dynamic situation even if they are not the agonist of the situation.
(22)  
   a. the Thames flows through London
   b. the Thames was flowing over its banks
   c. the ball moved

In (22a) there is the usual stative sense of FLOW. The Thames is an unbounded theme and it is not force-dynamically responsible for the situation. In (22b), the Thames is the unbounded theme of the sense of flows but it is now construed as being the agonist of the situation, with the banks of the river as the antagonist. In (22c), the ball is the bounded theme of the sense of the verb, but it is not the agonist or the antagonist. There is some force-dynamically responsible participant “offstage”. We shall see, therefore, that the way in which the thematic nature of ‘see1’ is characterised, as well as the force-dynamic nature of ‘see1’ will go some way to analysing the aktionsart of ‘see1’. I shall return to the force-dynamics of ‘see1’ in section 3.3.3.

   The thematic structure of ‘see1’ is complicated by another factor. There is a second thematic element in ‘see1’, which I call the perceptual trace.

   The perceptual trace of ‘see1’ is the impression of the object of an instance of SEE that travels to the mind of the subject of the instance of SEE. There are examples that show that ‘see1’ has a perceptual trace as well as a theme in (23).

(23)  
   a. Jane saw Peter looking blurred through mummy’s glasses
   b. Jane saw Peter looking fat through the distorting lens

In these examples, it is not the referent of Peter that is blurred, or that is fat. It is the image of Peter that has arrived in Jane’s awareness. The claim that the er of the sense of through is the perceptual trace of the object can be made more solid if we look at the example in (24). Goldsmith (1979) and Jackendoff (1983) point out that when FROM occurs with SEE, it marks the initial point of the gaze. It is true that FROM marks the beginning point of a path, however, it is not necessarily the case that FROM marks the point at which the ‘gazing’ theme of ‘see1’ begins.
It is possible to interpret (24) so that Peter is on the far side of the room and it is the perceptual trace of Peter that is from the far side of the room, not the starting point of the ‘gazing’ theme. There is a further example in (25).

(25) Peter saw the lightship through the fog from 3° N of its usual position

The issue is: what is through the fog? I take it that the lightship is 3° N of its usual position and that it is the impression of the lightship’s flashes that come from the lightship through the fog to Peter. In this case, therefore, through behaves entirely as it does with other verbs. In Peter pulled the string through the keyhole, it is the string that is through the keyhole, not Peter. When there is a direct object present, THROUGH is predicated of the direct object.

We cannot be sure whether the perceptual trace is bounded or unbounded, unlike the theme, because the prepositions with which it occurs in (25) can state the paths of either bounded or unbounded themes. TO and FROM mark the endpoint and starting-point of a path, respectively, but the theme of the verb of which they are xcomps can be bounded or unbounded. THROUGH, as (26) shows, can also occur with either a bounded or an unbounded theme.

(26) a. Jane walked through the door
    b. fog drifted through the door

In (26a), the referent of Jane is a bounded theme. In (26b), the referent of fog is an unbounded theme.

Examples (23) - (26) show that there are two themes of ‘see1’, as well as the ‘gazing’ theme there is a perceptual trace theme. The ‘gazing’ theme is unbounded; the boundedness of the perceptual trace theme is unestablished.

However, there is no part of the analysis of ‘see1’ that rests on the question of whether the perceptual trace is bounded or not as there are no wider linguistic
consequences. We could simply state that it is underspecified for boundedness. From
the point of view of the analyses in Figures 3.1 and 3.2, the significant issue is that
there is a perceptual trace of ‘see1’. I assume that ‘see1’ entails that the perceptual
trace makes contact with the perceiver just as it entails that the theme makes contact
with the percept.

3.3.2.2 The representation of the themes of ‘see1’
The previous section identified two themes of ‘see1’. In this section, I discuss their
representation within the semantic structure of ‘see1’ and present a revision to the
relevant part of Figure 1. The issue is what the candidates for the theme and the
perceptual trace of ‘see1’ are. The theme of ‘see1’ is not its subject; and, refining the
analysis in the section above slightly, the perceptual trace is not the object, but an
impression of the object.

(27) a. Jane saw into the cupboard
    b. Peter saw Jane through the box

In neither case is the referent of subject or object the er of the direction preposition.
The referent of Jane in (27a) is not the theme of the sense of saw. The er of the
sense of the preposition must therefore be some entity other than the referent of
Jane. This observation shows that the theme of ‘see1’ is non-standard: first, a
prototypical theme is the referent of the subject or the object of the sense of the verb.
The theme of ‘see1’ does not correspond to one of the syntactic dependents of the
instance of SEE. Secondly, a prototypical theme is a relation of a concept which isa
‘go’ or ‘move’; ‘see1’ isa ‘gazing’. These facts are the first part of my claim that
‘see1’ is a verb that has some thematic elements in its meaning but it is not a verb for
which motion is basic.

It is not possible to salvage the idea that the theme of ‘see1’ is the referent of
the subject of saw in (27a) by claiming that the theme is metonymically the referent of
the subject, with the ‘gaze’ being construed as a sub-part of the referent of the subject.
If this were the case, SEE would be able to undergo locative inversion when it has a
theme subject: one of the claims of Bresnan (1994) is that locative inversion requires the referent of the subject of the verb to be the theme of the sense of the verb. The failure of SEE to undergo locative inversion in (28) shows that the referent of the subject saw is definitely not the theme of ‘see1’, either literally or metonymically.

(28)  a. *into the box saw Jane  
      b. *to the horizon saw Jane

(28) provides conclusive evidence that the theme of ‘see1’ is not the referent of Jane, whether it is conceived of as ‘Jane’ or as part of ‘Jane’.

We have seen that the theme of ‘see1’ is co-extensive with its path and that the path has to have an endpoint. ‘see1’ is, therefore, like ‘reaching’. REACH shows the same pattern of replacement with prepositions, so that if REACH occurs with a path + endpoint preposition like INTO or TO its direct object is blocked.

(29)  a. the string reached the wall  
      b. the string reached (*the wall) into the next room  
      c. Jane saw the tapestry  
      d. Jane saw (*the tapestry) into the next room

In the examples in (29), we see that REACH shows the same patterns as SEE/’see1’ as far as occurrence with directional prepositions is concerned. It is only possible for the theme of ‘reach’ and ‘see1’ to meet one endpoint. The direct-object presents just such an endpoint; the directional prepositions present another. The theme of ‘see1’ behaves just like the referent of the string in (29a-b). The only possible candidate for such a theme is the gaze. ‘see1’ includes a gaze theme which travels from the see-er to the percept, or to the end of the path identified by one of the acceptable prepositions.

It is now possible to explain the differences between the themes of seeing and looking that were discussed in the Gruber/Van Develde/Goldsmith debate mentioned above. One of VanDevelde’s (1977) objections to the analysis of SEE and LOOK as
verbs of motion (that is verbs with themes), was that they could not all collocate with
the same range of prepositions. However, this objection is easily accounted for if we
recognise that the theme of seeing is different from the theme of looking: the theme of
seeing is unbounded and co-extensive with its path. The theme of looking is bounded.
Because the theme of looking is bounded, it is not co-extensive with its path; because
it is not co-extensive with its path, it does not make contact with the endpoint of the
path, or the percept, by virtue of whether the path is bounded. I explore this account
in greater detail in Chapter 4, where I also discuss the consequences for the aktionsart
of the sense of LOOK/A.

The theme of 'see1' does not correspond to a syntactic valent of SEE. And
this is where the problem lies. The theme of 'reaching' is quite clearly the referent of
the subject of an instance of REACH. It is here that SEE presents its biggest
Goldberg (1995) and Langacker (1987, 1991), among others, argue that certain
properties of syntactic argumenthood fall out of semantic principles. In this and the
preceding section, I have shown that 'see1', by virtue of being a verb of contact,
requires a terminal point to any path expression that occurs with it. So at least in one
respect, the syntactic behaviour of SEE/‘see1’ does follow from its semantics. But in
other important respects SEE/‘see1’ is utterly idiosyncratic: there is no other verb in
English that has a theme which cannot be syntactically expressed. Verbs like VOMIT
need not, and usually do not express their themes, but the theme can be stated as in
Peter vomited endless carrots. It is never possible to state the theme of ‘see1’. The
data from SEE add to the data enumerated in Hudson, Rosta, Holmes and Gisborne
(1996) which discusses a range of cases where syntactic valency cannot be predicted
from semantic properties.

The diagram in Figure 3.11 below captures the representation of the theme of
‘see1’. It involves a further semantic decomposition of ‘see1’. In the diagram, the
gaze is the ee entity of c2 and the er entity of c3. The diagram also makes claims for
the perceptual trace of ‘see1’, namely that the perceptual trace is an object related
image (which is not the image itself).
In the diagram below, I state that c3 is an instance of 'reaching'. My purpose is to simplify the diagram. 'Reaching' conflates 'touching' and 'moving'. However, this is not intended to deny the obvious differences between SEE and REACH. The first difference is that with REACH, THROUGH does not have to be object related, even when REACH occurs with both THROUGH and an object. Furthermore, 'reach' can have a bounded or an unbounded theme, unlike 'see1'.

(30) a. the string reached the wall through the window
    b. the dog reached the food through there
    c. the food is through there

(30a) shows 'reach' with an unbounded theme and through is predicated of that theme. (30b) shows 'reach' with a bounded theme; through is ambiguous. It could either be a directional preposition predicated of the dog, or it could be a locative preposition predicated of the food as in (30c). In (30a), through is predicated of the string.

It is also possible to have examples of SEE/'see1' occurring with THROUGH where THROUGH is a locative preposition predicated of the object. In (31), it is possible to interpret through there as being predicated of the food.

(31) the dog saw the food through there

A sentence like (31) could appropriately be a reply to why is the kitchen door shut? asked, for example, at a party. This suggests that SEE/'see1' can behave like REACH as far as its behaviour with THROUGH is concerned. On the other hand, the examples in (23) and (24) in section 3.3.2.1 above showed that THROUGH could be predicated of the image as well as of the gaze of 'see1'. This is what we should expect: THROUGH is ambiguous when it occurs with SEE/'see1' because the rules for THROUGH say that it has to be predicated of the theme of its head and the head of 'see1' has two themes. THROUGH is further ambiguous because as well as being a directional preposition it can also be a locative one.
In this section we have looked at the behaviour of SEE with directional prepositions. There are at least two different kinds of directional preposition that occur with SEE. The first kind is like INTO and TO. The second kind is like THROUGH. These data show that ‘see1’ is thematically idiosyncratic. I can think of no other examples of verbs that have two themes and only HEAR-class verbs can have themes that cannot be the referent of one of the dependents of the verb. There has been no need to have recourse to theoretical innovation in providing this account.

### 3.3.3 The force-dynamics of ‘see1’

There are, in the literature, two main positions on the force-dynamic nature of ‘see1’.

On the one hand, Croft (1991: 219) claims that there is a two way causal relation between the see-er and the percept. On the other hand, Langacker (1991: 304) describes SEE/’see1’ as an extension of the transitive verb prototype where there is no transmission of force. Schlesinger (1992) claims that experiencers all belong in an agent prototype by virtue of being in control of the situation in some way. On his characterisation, therefore, the subject of HEAR-class verbs would bear some degree of force-dynamic responsibility. Clearly the dispute arises because the facts are hard to identify. However, Jackendoff identifies some diagnostics, and I begin by looking
at how the force-dynamic nature of SEE/'see1' compares with Jackendoff's
diagnostics.33

3.3.3.1 A force-dynamic characterisation

If we look at the behaviour of SEE in terms of the diagnostics for agonist/antagonist
pairings, we see that its relations do not really conform to that dyadic distinction. The
semantic structure of 'see1' is too complicated; with so many different concepts
conflated within one situation, it is impossible for the referent of the subject of saw to
act on the referent of the object of saw in Peter saw Jane, for example. On the other
hand, in much the same way as the impossibility of a straightforward thematic
analysis did not preclude there from being thematic elements in 'see1', so we find that
the absence of a straightforward force-dynamic account does not entail that there are
no force-dynamic elements within 'see1'.

We can establish that there are force-dynamic elements in 'see1' using
diagnostics from Jackendoff (1990). The analysis of force-dynamics that Jackendoff
(1990) and Pinker (1989: 193) present relies on an instance of an action being dyadic.
An agonist, for them, is an agonist only if it acts on another entity. Neither of them
recognises a specific kind of action that is force-dynamic. Jackendoff assumes an
extra tier of conceptual structure in which the predicate AFF is appropriate: the first
argument of AFF is the agonist; the second argument is the antagonist. As
Jackendoff's theory is not relational, but is instead organised around conceptual
structure predicates, AFF is essentially a device for establishing force-dynamic
relations in Jackendoff's system. Jackendoff (1990: 125-126) claims that the main
diagnostics for an agonist/antagonist dyad are the test frames in (32).

(32)  a. what Peter did was.....

b. what happened to Peter was.....

33 Thalberg (1977) discusses the semantics of perception in the context of debates about the
philosophy of mind. Among other matters, he discusses whether the percept is responsible
for being perceived. However, his discussion of perception does not adduce linguistic
evidence.
(32a) is a test for a situation which is an action where the referent of *Peter* is an agonist, according to Jackendoff, and (32b) is a diagnostic for a situation where the referent of *Peter* is an antagonist.

Jackendoff admits that these diagnostics are "rough-and-ready" (1990: 125) but he does not offer any alternatives. Croft's (1991) typological study does not provide language-particular diagnostics for determining agent/patient relations, neither do Talmy's (1985b, 1988) papers on force-dynamics. The major problem with the diagnostics in (32) is that the "what happened" test can, as Jackendoff (1990: 294n7.1) points out, apply to "discourse" patients. That is, an argument of any verb can be construed as a patient given the right context. There are examples in (33).

(33)  
   a. what happened to Jane was that she killed a pedestrian  
   b. what happened to Jane was that she kissed the Blarney Stone

We can easily think of appropriate contexts for the examples in (33) although it is patently the case that the referent of *Jane* was responsible for the actions in the subordinate clauses and if they had an effect on her, the effect was one that we derive contextually. So we know that killing somebody usually results in your going to gaol and that kissing the Blarney Stone results in your having outstanding rhetorical powers.

What is more, the test with DO is not a test for an agonist but is instead a test for an actor, or do-er. If we take an example of any number of intransitive verbs, particularly unaccusative verbs, we can see that the referent of their subject is not an agonist, although it is a do-er. There are examples in (34)

(34)  
   a. the ball moved  
   b. what the ball did was move

Jackendoff's account does not capture the essential force-dynamic effect of agonists being a particular sub-class of actors. We cannot be certain that the DO test will
establish that the referent of a particular word is the agonist. Jackendoff uses the DO test to establish that an entity is the first argument of a Conceptual Structure predicate AFF. We could interpret Jackendoff as stating that the first argument of AFF was an agonist if there was a second argument, and a do-er if there was not.

If we apply the diagnostics in (32), being aware that neither test is entirely reliable, we can see that both the subject and the object can be force-dynamically significant in some way.

(35) a. what Peter did in Paris was see all the Georges Braques
    b. what happened to Peter was that he saw the Medusa’s face
    c. !what the Georges Braques did was be seen by Peter
    d. what happened to the Georges Braques was that Peter saw them

Apart from (35c), where it is not possible to conceive of a collection of paintings as the er of a ‘doing’ situation, it is clear that the tests for the force-dynamics of ‘see’ show that both perceiver and percept can be agonist like and antagonist like. In the next section, I introduce evidence from Croft (1991) which suggests more conclusively that both participants can be agonist and antagonist like.

3.3.3.2 Croft’s view

Croft (1991: 220) states that “since experiencer and stimulus are both simultaneously initiator and endpoint, they are identical in causal structure”. This observation is not quite true. It is true that both the perceiver and the percept are simultaneously the beginning and the end of a path, but it is not true that they are both the beginning and the end of a causal chain. Croft (1991: 220) points out that see and be visible, as in (36), are converses. The examples and judgements are Croft’s.

(36) a. The peak is visible for hundreds of miles
    b. ?I can see the peak for hundreds of miles
    c. John can see the peak from here, but my eyes aren’t good enough
    d. ?The peak is visible to John from here, but my eyes aren’t good enough
Croft states that the expression *be visible to* is preferred "when the perceptual relation is attributed to some property of the stimulus, for example the height of the peak, as is implied by the phrase *for hundreds of miles.*" These data, however, are no evidence that the percept and the perceiver are both equally causally responsible. First, I dispute Croft's judgement about (36d). This is perfectly acceptable. Secondly, Croft wants to assert that the force-dynamic relations of *see* and *be visible* in (36) are dyadic. I think that this cannot be the case and what he has observed is that the subjects of *see* and *be visible* are both archagonists in the sense of Rosta (1992, 1995). It is quite impossible for the referent of the subject in (36a) to be an agonist: there is not an antagonist for it to be in an oppositional relationship to. Hence, if there is a force-dynamic relationship, it is clear that the referent of the subject is primarily responsible for a viewing situation, that is, it is the archagonist.

(36b) is weird because the object of *see* is not appropriate as the subject of *for hundreds of miles.* A string like *for hundreds of miles* needs to be predicated of an entity that has a degree of physical extent: *I can see the trees for hundreds of miles* is fine. Alternatively, *for hundreds of miles* could modify the whole seeing situation. Croft appears to claim that his doubts about the acceptability of this example concern the facts that *for hundreds of miles* is object related and the archagonist of *see* is the referent of its subject. Therefore, *for hundreds of miles* cannot relate to the seeing. I think, however, that the unacceptability of (36b) has more to do with *for hundreds of miles* needing to be predicated of a quality of the peak, and there is no appropriate quality in this example. *For hundreds of miles* does not behave like *to the wall* in (37).

(37) a. *Peter can see Jane to the wall*
    b. Peter can see to the wall

(Examples like this were discussed in section 3.3.2.2.) There is no modification that can be made to the object of *saw* in (37) that would make *to the wall* acceptable. All of the examples in (38) are unacceptable.
(38)  a. *Peter can see broken glass to the wall
    b. *Peter can see grass to the wall
    c. *Peter can see trees to the horizon

And yet *Jane can see trees for hundreds of miles* is fine. The conclusion must be that
*for hundreds of miles* is in a different grammatical relationship to *see from to the wall.*

(36d) presents the most problematic case. If we accepted Croft’s judgement
there would be no problem: from the point of view of the grammar, the referent of the
subject is the archagonist of the situation. Therefore, the experiencer’s physical
abilities should be irrelevant. However, I find (36d) fine. I think that the reason is
that we construe physical perception as involving two physical constraints. The first
is the perceive’s ability to see, the second is the percept’s ability to be seen. The
percept’s ability to be seen is relevant to the interpretation of event percepts. *Jane
saw Peter think in Latin* is nonsense; such an event cannot be perceived in that way.
Clearly, *is visible to* prioritises the percept’s ability to be seen, but this does not mean
that the perceive’s ability to see is immaterial. Either the perceive’s ability to see, or
the percept’s ability to be seen can affect the outcome of a perceptual situation. The
difference between the *is visible examples* and the *can see examples* is that the
archagonist of the first is the percept, and the archagonist of the second is the
perceiver. In fact, the example in (39) is fine, too:

(39)  Jane could see the peak but it was too covered in cloud for Peter to be able
to discern it

In (39) Peter’s inability to see *the peak* is ascribed to a property of *the peak.*

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34 Given the claim about diathetic SEE in Chapter 1 and the discussion above about the
nature of *to* phrases and the bounding of a ‘see1’ situation, I assume that *to* phrases are
xcomplements and *for miles* is an adjunct which is predicated of the whole situation.
Paradoxically, what Croft seems to be claiming is not that there is a two way agonist/antagonist pairing between the perceiver and the percept but that there is a strange case where both the perceiver and the percept have some of the properties of an archagonist. In this case, what happens is that the entity which is the subject of see or is visible in the examples in (36) is construed as the archagonist. As Rosta (1995) points out, the property of being an archagonist is a subject related property, although not all subjects are archagonists.

It is possible to recast this observation. Given the gestalt nature of Talmy’s original conception of force-dynamics (where the agonist is the figure) I would expect there to be a coercion whereby subjects were identified as being more force-dynamically responsible than objects because, in Talmy’s account, subjects are figures. The examples in (39), each of which foregrounds a different participant in the situation, make this observation. However, Croft has made an important second observation, which is that there is nothing inherent about percept and perceiver that ensures that one or other of them is more or less likely to be force-dynamically responsible. Furthermore, the example in (39) shows that objects can be force-dynamically responsible, too.

3.3.3.3 Langacker’s perspective

Langacker’s (1991: 304) account claims that instances of SEE complemented by a direct object are extensions of the transitive verb prototype (exemplified by Jane hit Peter) which include situations where there is no transmission of force from the subject to the object. In the case of visual perception, Langacker (1991: 304) believes that “the object’s semantic role is zero”.

We have already seen that the object of an instance of SEE cannot have a “zero” semantic role because, quite apart from its being percept, there is also the perceptual trace that we noted in section 3.3.2. Furthermore, Croft’s observations about whether a percept can be force-dynamically responsible or not show that it can, and example (39) shows that the object of see can be force-dynamically responsible, too.
In Talmy’s (1985b, 1988) system the force-dynamics of the sense of a verb are established in terms of an agonist and an antagonist. These notions correspond to Cognitive Grammar’s familiar notions of figure and ground. The agonist, or figure, which is typically realised as the subject, is involved in a force opposition against the antagonist, or ground, which is typically realised as the object. Talmy (1988: 53) states that he views agonist and antagonist as semantic roles related to agency. Talmy’s system is developed in terms of prototypical transitivity. Langacker’s view is also structured in terms of prototypical transitivity, and consequently, given that there is no transmission of force from subject to object, it is easy to see why Langacker claims that ‘see1’ is force-dynamically neutral.

However, for Talmy force-dynamic relations are not just relevant to prototypical agency, they also apply to, for example, to modality and Sweetser (1990) develops a force-dynamic model of modal verbs, which analyses both epistemic and deontic modality as involving force-dynamic transactions. Langacker’s insistence on a model of prototypical transitivity means that he misses a number of relevant observations about the force-dynamic structure of ‘see1’.

### 3.3.4 Some theoretical considerations for WG

The discussion in sections 3.3.2 and 3.3.3 has involved a range of semantic relations, theme, agonist and antagonist, which are not represented in the semantic diagrams in Figures 3.1-3.11. In this section, I discuss the status of these relations in WG theory and the consequences for the model of semantic structure.

As I stated in Chapter 1 and the initial sections of this chapter, WG is a theory which is organised into hierarchical inheritance structures, it is prototypist. WG treats both situation types and semantic relations as prototypes. It is possible to explore this in terms of analogies. Thinking first about familial relationships let us take the notion of father. This can either refer to a person, your relative, or to a relationship where someone behaves like a father to you. Both notions are structured prototypically -- the prototypical father relative is a man who is older than you and who has had, and may still be having, an intimate relationship with your mother. You may still have a father relative, but a non-prototypical one. The children of the former James Morris
have a father relative who fits the prototypical father relative model in that he has an intimate relationship with their mother, to whom he is married, but who does not fit the model in one important respect: "he" is now "she", and well known as the writer Jan Morris, having undergone gender reassignment treatment.

Alternatively, you may have a father-relative who is prototypically your father-relative, in that he is a man, he is in an intimate relationship with your mother, he was your biological father, he has fulfilled certain social obligations that your upbringing caused him, but you may not have a prototypical relationship with him. An incestuous relationship would not be prototypical. The relationship between a parricide and his or her father is presumably not prototypical.

If we think now about language, it is clear that the relation "subject" is definable in the same two ways. "Subject" can either mean the word or word string that stands in a subject relationship to a verb, or it can refer to the subject relationship itself.

Both are prototypes. A typical subject relationship is the relationship between a tensed verb and its subject entity. But we claim that there is a subject relationship between an xcomp and its subject entity, even to the extent where we claim that the italicised string in (40) has a subject, the underlined word.

(40) I consider **him** a nice man

Such a relationship is clearly not prototypical. The typical subject relationship is signalled, even in English, by some kind of agreement. The typical subject relationship holds between a verb and a noun. The relationship in (40) holds between two pronouns.

A prototypical subject entity is a noun or pronoun, but there are examples like (41) where there is a subject-relationship between a tensed verb and another which is quite categorically not a noun or a pronoun.

(41) a. to err **is** human
    b. that he was a bit unhelpful **was** known to everyone
c. **behind** the gym is a good place to smoke

In all the examples in (41), the italicised word is the tensed verb, and the underlined word is the subject-entity, an infinitival TO in (41a), a subordinating conjunction in (41b) and a preposition in (41c).

WG is unlike other theories. Both predicate logic and Jackendoff's Conceptual Semantics treat the meanings of verbs, for example, as relational categories in contradistinction to the meanings of concrete nouns which they treat as non-relational categories. WG treats the senses of both nouns and verbs as non-relational categories; they are both instances of things. We can conceive of the difference between a concrete noun, an intransitive verb, and a transitive verb in the following ways: a concrete noun has no er or ee, an intransitive verb has an er, and a transitive verb has both an er an ee. Certain nouns, those that have events rather than physical things for their senses, may also have ers and ees. Examples include nouns like EXPLOSION. It is ers and ees that are relational, not the concepts that they are relations of.

These points are important because they give us an opportunity for classifying force-dynamic relations. In these terms, agonist and antagonist are relations, just like er and ee. A prototypical transitive verb will have a sense that has both an agonist and an antagonist but other combinations are possible. By viewing semantic roles as relational and looking at the concepts that they relate, we are able to explain why all of the possible analyses of causation discussed in Croft (1990: 49) have been applied as models of causation. These are the "events cause events" account; the "individuals cause events" account; and the "individuals act on individuals" account. Croft states that these are different views of causation and he prefers the last model. I claim, however, that all three models capture pertinent intuitions about causation which we should want to explain.

Figure 3.12 gives an idealised diagrammatic representation of the WG model of the causative/inchoative/statative triad of OPEN discussed in Croft (1990), and in Croft (1991: 264).
Figure 3.12 says that the causative sense of OPEN is an instance of ‘doing’; the inchoative sense of OPEN is an instance of ‘moving’; and the stative sense of OPEN is an instance of ‘being’. Hence in WG there is no situation which is a ‘causing’: a situation is a causing situation if (and only if) it has a result: many situations have results built into their semantic structure and they are not all prototypical causative situations. A prototypical causing situation is like the one represented in Figure 3.12 as c1: it has a result and it involves a force opposition.

![Diagram](image)

**Figure 3.12**

- Figure 3.12 captures the “events cause events” account with the result relation. C2, an event, is the result of c1, also an event. However, c3, a state, is the result of c2. This is not a consequence of causation. It is a consequence of the way in which conceptual structures are complex and verb meanings decompose. It is in this respect that the model of semantic subordination which Figure 5 shows is similar to Levin and Rapoport’s (1988) model of Lexical Subordination.

- Figure 3.12 captures the “individuals cause events” account with the er relation. This relation is a prototypical one: the prototypical er is an instigator, a sentient entity and responsible for the event, among other prototypical properties of agents. As with all prototypical properties, default inheritance means that these settings can all be overridden: one difference between *Jane broke the window* and *the ball broke the window* is that *Jane* is sentient but *the ball* is not.

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35 In this diagram there are two lexemes OPEN because of the word-class difference between OPEN/verb and OPEN/adjective.
• Figure 3.12 captures the “individuals act on individuals” account with all three relations, er, ee and result. Figure 3.12 captures the fact that c5, the ee of c1, is acted upon by c4, the er of c2. C1 causes c2 so c5 is acted upon by c4 directly, by virtue of being the ee of c1 and indirectly, by virtue of being the er of c2, which is the result of c1.

Being prototype relations, er and ee are subject to default inheritance (Hudson, 1990: 30-52) which means that individual elements in the prototype need not be present. The question to address is whether thematic and force-dynamic relations of a concept are always co-extensive with its er and its ee; that is, are theme, agonist and antagonist necessarily part of the er and ee prototypes?

Some relations are defined by the situation that they are relations of. Theme is always the er of a ‘moving’ or of an ‘extending’ situation. The er of an ‘owning’ situation is always a possessor. However, it need not be the case that all semantic relations are defined over situation types. In particular, it appears that force-dynamic relations are not necessarily defined over situation types. Returning to Figure 3.12, let us re-examine the relationship between causative and inchoative OPEN/v.

There is no particular reason to identify the relation between c1 and c5 in Figure 3.12 as an ee relation. In an example like Jane opened the door, there are no criteria for identifying ees, apart from the general association with objects. More specifically, the referent of the door is the antagonist of the sense of opened. It is in no other relation to the sense of opened. It is also a theme, but it is theme by virtue of being the er of a moving situation which is subordinate to the sense of opened. If we call the relation between c1 and c5 in Figure 3.12 antagonist, we need not call it ee. Potentially, ee becomes available for other uses.

The first advantage to such an account is that it captures the “individuals act on individuals” model of causation more effectively than the traditional WG account in Figure 3.12 because it states it directly. In Figure 3.12, the “individuals act on individuals” account has to be induced over the relationship between the ee of c1 and the er of c2 and the fact that c2 is a result of c1. If we state that c5 is the antagonist of
c1, and that c4 is the agonist, the "individuals act on individuals" account follows automatically.

A second advantage is that, by virtue of not being limited to configurations of situations, agonist and antagonist become available for use elsewhere in word meanings and grammatical structures. As Sweetser (1990) demonstrates, they are essential in accounting for modality. If agonist and antagonist can only be induced over structures like that in Figure 3.12, they are not available for general use elsewhere.

A third advantage is that agonist and antagonist are defined locally. A model like Figure 3.12, which induces force-dynamic relations over semantic structures involving more than one situation, suggests that they are therefore not encoded in the grammar, yet there are grammatical constructions, like those involving verbs such as FORCE, where force-dynamic relations are central.

A fourth advantage is that force-dynamic relations can be established according to grammatical need. For example, as I mentioned above, Rosta (1995) shows that a primarily responsible entity (the archagonist) is necessary to account for mediopassive. If force-dynamic relations had to be identified over swathes of conceptual structure as in Figure 12, it would be impossible to identify archagonist as a relation. Another example is Croft's (1991) initiator. We would want to say that this relation is potentially part of the er prototype, but that not all ers were initiators. If we allow force-dynamic relations to be basic, we can say that some ers are initiators while others are not.

A fifth advantage is that by recognising the separate existence of force-dynamic relations, it is possible to revise the inventory of semantic relations. Specifically, the ee relation can link situations to situations as well as situations to entities: this possibility adds to the range of devices that can link situations to situations without adding a new relation into the inventory of semantic relations. Furthermore, we can use the fact that ees are prototypically antagonists, and the fact that they need not always be antagonists, to some effect in the analysis of unergative verbs: I exploit this possibility in Chapter 4.
However, if agonist and antagonist are to be basic and primitive relations, not defined in terms of particular situation types, it is necessary to consider what er and ee will be and how they will relate to agonist and antagonist. In Figure 3.12, the ee relation of c1 is only there in order to establish a relation between c1 and c5. If we class this relationship directly as antagonist, capturing the fact that there is a direct force-dynamic relationship, we can consider what it is that ees typically do. An ee typically marks the relationship between a situation and whatever completes that situation. In a cooking situation, the ee is what is cooked; in a building situation, the ee is what is built. In a doing situation, such as that indicated by c1 in Figure 3.12 the ee is what is done. "What is done" is, in fact, the opening situation. The ee of c1 could legitimately be c2.

This approach to semantic relations is concerned with getting the right degree of specificity. There is no point in calling the antagonist of causative ‘open’ its ee because it shows no ee properties, apart from being the acted upon entity.

This approach to semantic relations allows me to reanalyse object raising and object control structures too. ASK as shown in Figure 3.13 presents the analysis of an object control verb on the view that I am expounding here.

![Figure 3.13](image)

This structure compares with the traditional WG structures for object control which analyses Jane asked Peter to go home as in Figure 3.14.

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36 In this and subsequent diagrams, “ago” means agonist and “ant” means antagonist.
On the ee diagnostic where ees are decided according to what is done by the verb, the ee of 'ask' in Figure 3.13 is the request, *Peter to go home*. It is not *Peter*. 'Peter' is the antagonist: by her request, Jane is acting on Peter. The same is true of PERSUADE. In *Jane persuaded Peter to see a psychiatrist*, the persuasion is *Peter to see a psychiatrist*. By the "what is done" criterion, the ee is the proposition, not the referent of the object. The referent of the object is, however, the antagonist of the sense of the verb. 'Peter' is, however, the antagonist of the sense of the verb. He is acted upon by Jane.

We can compare object control structures with object raising structures like *Jane expected it to rain* in Figure 3.15.

On my revised account, the only real difference between object raising and object control is that in object control, the referent of the object is the antagonist of the sense of the verb. It is notable that in neither *Jane asked Peter to go home* or *Jane expected it to rain* is the subordinate situation a "result" of the sense of the verb in any literal
way. Neither could literally be a result. This view of force-dynamic relations and the result relation has the further advantage of unifying object raising and object control with subject raising and subject control. In neither of the subject patterns is there a result relation.

The resulting view of semantic structure makes available as separate relations ee, result and antagonist. However, I think that while a view of raising and control structures (which applies to *Jane saw Peter cross the road*) is better analysed on the account put forward in this section, we shall find below that there is still a need for an account which uses both of the relations result and ee, particularly in cases where there are no clear grounds for identifying an antagonist. Just such a case exists in the decomposition of ‘see1’ above. In the rest of this thesis, I make use of the ability to separate antagonists from ees; however, I shall continue to distinguish between ees and results and to use both relations in accounting for sense decompositions.

Furthermore, I think that there is no need to revise the analysis of ‘gazing’ in the decomposition of ‘see1’. It requires there to be an er, an ee and a result in a context where there is no clear strategy for identifying the force-dynamic participants of ‘gazing’.

### 3.4 The temporal duration of ‘see1’

In 3.1, I claimed that the temporal duration of an instance of seeing was conditioned by two factors. The first was the duration of the percept; the second was the ability of the perceiver to maintain his or her attention during any given instance of seeing. In this section, I examine, and support, the claim that ‘see1’ has no inherent duration and that its duration is, therefore, limitable by the duration of the percept. I restrict myself to a discussion of event percepts, rather than physical things, on the grounds that their duration is measurable. In addition, I do not consider percepts whose referent is a proposition because we have seen that a propositional percept is never the ee of ‘see1’. Consequently, the discussion is limited to -ing participle xcomps and bare infinitive xcomps because these have situations as their referents.

One major claim in the literature is that when the sense of an instance of SEE is ‘see1’, it restricts the class of its possible xcomps to those that have dynamic
This point is widely noted in the literature, for example by Aarts (1995), Bolinger (1973), Felser (1994) and Rosta (1995). This claim is important because we can explore the duration of a seeing situation by reference to the duration of the dynamic referent of the xcomp. However, there is some evidence that this claim is formulated too strongly. Therefore, I explore this assertion in addition to looking at the other elements in the semantics of the xcomps of instances of SEE.

This section is divided in the following way: section 3.4.1 considers whether the referent of the xcomp of SEE does have to be dynamic; section 3.4.2 looks at the semantics of -ing participles and bare infinitives as xcomps of SEE; section 3.4.3 considers the question of whether a situational percept and an act of perception have to be simultaneous; and section 3.4.4 considers whether Jane saw x, where the referent of x is some situation, entails x.

### 3.4.1 Need the referent of the xcomp of SEE be dynamic?

When the referent of the xcomp of SEE is a non-dynamic situation there is a degree of unacceptability or ungrammaticality about the examples. There are examples in (42) of xcomps of SEE which have stative referents. They are all unacceptable.

(42) a. *we saw Rome stand on the Tiber*
b. *we saw Jane nasty to Peter*
c. *we saw Peter own a car*

The reason why the referent of the xcomp of an instance of SEE has to be dynamic is that the referent of the instance of SEE and the referent of its xcomp have to be simultaneous (subject to the caveats discussed in 3.4.3), and it is impossible for a seeing situation to be co-extensive with a state. A state is potentially timeless. That is, the temporal bounds of a stative situation do not exist within the temporal bounds of human experience, yet perception is entirely delimited within the bounds of human, physical, experience. The constraint on stativity must be stated in these terms.

The requirement that the referent of the xcomp of an instance of SEE should be dynamic can be overridden given the right context. There are examples in (43).
In (43a), a situation that is typically stative has become re-interpreted as a dynamic situation. The difference between (43a) and (43b) is roughly equivalent to the difference between (44a) and (44b). In (44b), the referent of the stative predicate NASTY has been reclassified as a dynamic situation.

In the case of (43b), the temporal adverbial limits the owning situation and makes it possible for the verb own to be the xcomp of see. It is not the case, however, that temporally bounding the referent of own makes the referent of own into a dynamic situation. Even when it is temporally bounded by an adverbial, own is not typically dynamic, for it cannot occur in the progressive. (45) is an unacceptable sentence.

A verb with a stative referent can be the xcomp of an instance of SEE if it is temporally limited or if it is reclassified as a dynamic situation.

Furthermore, (45) shows us that temporally limiting a state does not by itself cause it to be reinterpreted as a dynamic situation. From the point of view of the temporal semantics of ‘see1’, this suggests that the significant factor is that either the whole situation has to be perceivable or that a linguistically relevant part of it has to be perceivable. As far as the temporal duration of seeing is concerned, (43b) is significant because the temporal adverbial for all of 5 minutes once, which is the dependent of own, also limits the duration of the seeing situation, which must therefore be co-temporal with the owning situation. This fact is further support for the
conclusion that the constraint on the xcomp of an instance of SEE is not that its referent should be dynamic but that its referent should be of a perceivable duration. There are other cases where verbs with stative referents can occur as the xcomps of instances of SEE. There is a sample in (46) and (47).

(46)  
  a. seeing Jane own a car at last brings tears to my eyes  
  b. it is a delight to see Jane own a car at last  
  c. I have seen Jane own a car before; it all ended in tears

(47)  
  a. seeing Jane owning her own car brings tears to my eyes  
  b. it is a delight to see Jane owning a car at last  
  c. I have seen Jane owning a car before; it all ended in tears

In these cases, the stative own of (46) and the stative owning of (47) are both xcomps of the instances of SEE. They are not adjuncts of Jane. In all of the cases, Jane could be replaced by a pronoun and pronouns cannot have adjuncts. Therefore, in none of the cases is owning a participial relative; it is an xcomp.

The examples in (46) and (47) are clear evidence that the restriction on the referent of the xcomp of an instance of SEE cannot be stated in terms of dynamicity. It can, however, be stated in terms of duration. For some reason, the semantics of own in (46) and the semantics of owning in (47) are compatible with the semantics of the non-finite seeing, see and seen of (46) and (47). We cannot investigate whether own and owning would be compatible with a progressive instance of SEE because there are none when the sense of SEE is ‘see1’.

(48)  
  a. !I can see Jane own a car  
  b. I can see Jane owning a car (ref. of see is not ‘see1’)

(48a) is unacceptable; in (48b) the sense of see is not ‘see1’ but is, in fact, ‘imagining’. In this case, Jane owning a car refers to a proposition and not a situation.
However, it is possible to examine the question in terms of temporal deixis. The referent of the xcomp of an instance of SEE is required to be temporally bounded if the instance of SEE is temporally deictic. This accounts for the fact that (48a) is unacceptable. There is only a requirement on the temporal nature of the referent of the xcomp of SEE when the temporal nature of SEE itself is in question. There is no straightforward way of referring to a present time instance of seeing, except with the collocation CAN + SEE. Uniquely among the modals it is possible for the referent of CAN to be a present time instance of the sense of the xcomp of CAN. A CAN + SEE sequence is temporally deictic as the example in (49a) shows.

(49) a. I can see the “Mona Lisa” (even over the crowds’ heads)

b. I saw the “Mona Lisa”

(49a) entails that my seeing the “Mona Lisa” is co-extensive with the time of the utterance; (49b) entails that I saw the “Mona Lisa” at a time wholly in the past in relation to the time of the utterance. It is possible for (49a) to be temporally deictic, although the root of the sentence is can because can has an ability meaning here, and to be able to see something at a particular point in time must entail that you are seeing it. This sense of CAN is temporally deictic; we see that the past tense form of CAN, when CAN means ability, has past time reference. I discuss the semantics of SEE and CAN in section 3.6 below.

It is clear why the referent of the xcomp of an instance of SEE only has to be temporally limited when the instance of SEE is deictic. An instance of seeing that is located in time has a duration, irrespective of the fact that its duration is constrained by the percept. Given that it has a duration, it is only possible to see some sub-part of a state physically. If the duration of the instance of seeing is not temporally deictic, then the respective durations of the situations are irrelevant and the referent of the xcomp of the instance of SEE may be a state. We can see, therefore, that Declerck’s (1981) assertion that examples like those in (46) and (47) should be ignored is false. They are relevant, because they demonstrate that ‘see1’ does not require its ee to be eventive, it merely requires its ee to be temporally limited to a duration within a
perceivable range. It is for this reason that temporally bounded states are acceptable as the referents of xcomps of temporally deictic instances of SEE.

3.4.2 The semantics of -ing participles and bare infinitives

There are aspectual differences between xcomps that are -ing participles and those that are bare infinitives as in (50).

(50) a. Jane saw Peter drawing a circle
    b. Jane saw Peter draw a circle

In (50a) the complement is unbounded; in (50b) it is bounded. These facts are shown in Kirsner and Thompson’s (1976) examples.

(51) a. I saw her drowning, but I rescued her
    b. *I saw her drown but I rescued her

In (51a) the subject saw an event in progress that could be interrupted before its necessary completion; in (50b), the bare infinitive has to be interpreted as being perfective or completive. The debate in the literature has been about whether the difference between a base form of the verb and an -ing form is one of boundedness (or telicity), which is Kirsner and Thompson’s (1976) view or one of progressiveness, which is Declerck’s (1981) claim.

In fact, Declerck can be ignored. He does not provide an account of the semantics of progressive aspect in English and he fails to show that progressive constructions are non-compositional. I assume that the semantics of progressive constructions are composed out of the aktionsart of the verb and the partitive nature of the -ing participle. Given that Declerck does not show how the semantics of progressive need to be interpreted differently from a composition of the semantics of

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37 Van der Does (1991) discusses the semantics of bare infinitives after instances of SEE but within a very different framework from the one used here. Mittwoch (1990) also discusses bare infinitives after SEE.
ing participles and the aktionsart of the verb we cannot evaluate his claim that the
imperfective meaning of (50a) and (51a) is due to the nature of progressiveness rather
than the -ing participle.

Progressive aspect in English is partitive. One of the most important
distinctions between the two examples in (52) is that (52a) has a part of a walking
home situation as its referent, whereas the example in (52b) has the whole of a
walking home situation as its referent.

(52)  a. Jane was walking home when Peter spoke to her
     b. Jane walked home when Peter spoke to her

Consequently, the most natural interpretation of (52a) is that the speaking event took
place in the middle of the walking event: the referent of walking is some part of the
whole walking event, and the walking and speaking events are co-temporal. The most
appropriate interpretation of (52b) is that the walking event and the speaking event are
consecutive and the walking event follows the speaking event. (52a) is not specific
about which part of the walking event was punctuated by the speaking event; it just
states that he spoke to her at a particular time which was part of the whole walking
event.

The partitvity of progressive aspect in English is due to the partitvity of the
semantics of the English progressive participle, which explains why (51a) is fine.
What is seen is part of the drowning situation, not the whole thing. (51b) on the other
hand, has an xcomp that refers to a whole drowning event. Therefore, the sentence is
anomalous.

The next issue is whether partitivity is the only relevant element in the
semantics of -ing participles. There is a possibility, raised by Declerck (1981), that
they are dynamic as well as being partitive because of the regular association with
progressive aspect. In English, it is typically only verbs which have inherently
dynamic senses that can occur in the present progressive, although stative verbs have -
ing participles. Examples (53)-(55) give instances of verbs which have an -ing
participle but which are not dynamic. The a. sentences show instances of the
participles in participial relatives. The b. sentences show instances of the participle being unacceptable in a progressive construction.

(53) a. give the woman owing the most money your help
    b. !she is owing the most money
(54) a. take your fee from the woman owning the most property
    b. !she is owning the most property
(55) a. put the bananas in the bowl containing fruit
    b. !the bowl is containing fruit

It is clear, therefore, that dynamicity is a property of the senses of individual verbs. It is not inherent to present participles nor is it a necessary condition of progressive aspect in English as examples like *I am living in Cambridge*, which refer to a contingent state, demonstrate. The question of why there is a tendency for progressive aspect to be limited to verbs with dynamic referents in English remains an open research question beyond the domain of this thesis. (This condition appears to be subject to speaker variation and to be changing.)

We saw in the previous section that the referent of the xcomp of SEE need not be dynamic as long as (i) the instance of SEE is not temporally deictic or (ii) the stative referent of the xcomp of SEE is temporally limited so that it occurs within the possible bounds of a seeing situation. *-ing* participles can be the xcomp of an instance of seeing for as long as the instance of seeing meets the requirements for stative xcomps. It is necessary, however, to establish that the *-ing* participle is an xcomp of SEE and not a participial relative.

(56) shows that it is possible for participial relatives to occur in this kind of situation; (57)-(60) show that the participles concerned are xcomps of the instance of SEE and that they are not participial relative adjuncts of the noun which is the direct object of the instance of SEE.

(56) a. it is a delight to see the bowl containing so much fruit
    b. I have seen the bowl containing this much fruit before
We can see that *containing* in both (56a) and (56b) is an xcomp of *see* and *seen* because it is possible to replace to replace *the bowl* with *it*.

(57)  
   a. it is a delight to see it containing so much fruit  
   b. I have seen it containing this much fruit before

Pronouns cannot have adjuncts, except in exceptional circumstances, as the examples in (58) show.

(58)  
   a. !give her owing the most money your help  
   b. !take your fee from her owning the most property  
   c. !put the bananas in it containing fruit

Furthermore, we can see that *containing* in (57a-b) is an xcomp because the following passives are acceptable. When a participle is an adjunct of a noun in a participial relative, it cannot be split from its head like this. If the head of a participial relative is moved to the subject of a passive then its adjunct has to move with it.

(59)  
   a. the bowl was a delight to have been seen containing so much fruit  
   b. the bowl has been seen containing this much fruit before

This assertion is borne out in (60): we can see that it is entirely possible to promote the indirect object to passive subject but not if the participle adjunct is left behind.

(60)  
   a. the woman was given Peter’s help  
   b. the woman owing the most money was given Peter’s help  
   c. !the woman was given owing the most money Peter’s help

The reason is quite straightforward: *owing* is dependent on *woman* in (60) and cannot be separated form it, whereas *containing* is not dependent on *bowl* in (59) and so they
can be separated. We can be certain that the participles in (56) are xcomps of *see* and *seen*.

I showed in 3.4.1 that there is no restriction on the dynamicity of the xcomp of an instance of *SEE*, given the right semantic conditions the referent of the xcomp of *SEE* can be dynamic or stative. I have also shown that the grammar licenses an *-ing* participle as the xcomp of *SEE*. The relevant claim is, therefore, that the difference between a participle xcomp of an instance of *SEE* and a bare infinitive xcomp is that the latter, as Kirsner and Thompson (1976) state, refers to a whole event that is perceived whereas the former refers to part of a situation. No reference is made to dynamicity, telicity, or any other aktionsartal category.

Declerck's (1981) observation that there is no semantic difference between the *-ing* participle and the bare infinitive of a stative verb as the xcomp of *SEE* falls out naturally from the analysis of this and 3.4.1. As dynamicity is not relevant to the difference between *-ing* participle xcomps and bare infinitive xcomps of *SEE*, contrary to Declerck's claims, the only relevant semantic difference is that between a completed event (as in *she saw the cat drown*) and one that is not completed (as in *she saw the cat drowning*). However, in the case of an xcomp of *SEE* with a stative referent, the difference between the whole state and part of the state, as it were, is obliterated. The stative xcomp can only occur with *SEE* if the temporal duration of the referent of the xcomp is limited by a temporal adverbial, or if the instance of *SEE* is temporally non-deictic. Therefore, the inherent temporal semantics of the stative verb are made irrelevant to the semantic analysis of the instance of *SEE*. Any sub-part of a state will have the same temporal qualities as the state except that it may be bounded. However, the semantics of *-ing* participles merely states that a sub-part of the situation is relevant; they do not bound the sub-part. There is, therefore, no discernible difference between the semantics of *-ing* participles of stative verbs and the bare infinitive xcomps of such verbs in any context.

### 3.4.3 Simultaneity

Excepting the caveats below, the perceived situation which is the referent of the xcomp of a perception verb and the referent of the perception verb are simultaneous.
This claim is not only an empirical one; it is also central to the analysis of the temporal semantics of SEE which claims that SEE is temporally underspecified and that its temporal duration is set by its ee. Also, the visual image must last as long as the seeing. It is not just the final outcome.

Felser (1994) made a similar claim about the perceived and the perceiving events having to be co-temporal. During the discussion of that paper, J. Higginbotham (p.c.) observed that the examples in (61) suggest that the perceiving and the perceived events might not be simultaneous.

(61)  
a. Jane saw the ball hit the window  
b. Jane heard the ball hit the window

If we assume that there is a single ball hitting event, and (61a-b) report how Jane became aware of this fact through two of her senses, according to Higginbotham the examples in (61) cannot report simultaneous seeing and hitting, and hearing and hitting events because we need not experience the seeing and the hearing simultaneously. If we need not experience the seeing and the hearing simultaneously, we cannot claim that the event in the subordinate clause and the matrix perceptual event are simultaneous.

Such an objection is disingenuous. Sound travels more slowly than light. If one is simultaneous, the other is not. There are examples we can come up with which make it perfectly clear that we can encode this fact linguistically. For example, I heard the bomb explode 5 seconds after I saw it explode is a perfectly acceptable sentence of English which is by no means anomalous. On the other hand, it is clear that hearing and seeing are typically experienced as being co-temporal. It is in quite exceptional circumstances that we perceive them as having different durations. We perceive events affecting our senses as happening at the same time as we perceive them.

Any example, other than those like I heard the bomb explode 5 seconds after I saw it explode, where there is conflicting sensory evidence, which tries to locate the perceiving and the perceived events at different times automatically runs into
problems of interpretation. (62a-b) are only interpretable because we live in an age of recorded visual and aural images where what is perceived is a recording of the original event.

(62)  a. Jane saw Peter play King Lear 5 years after he gave up acting  
     b. Jane heard Peter singing rock ballads 5 years after his tracheotomy

The examples in (63) are all uninterpretable.

(63)  a. !Peter felt the wind blow on his face 5 minutes after he boarded the 747  
     b. !Peter tasted the gobstopper change flavour after he finished it  
     c. !Peter smelt dinner burning after he’d done the washing up

We can be clear that English treats the perceived event as being simultaneous with the perceiving event except where there is conflicting evidence from more than one sensory channel. That is, the relationship between ‘see!’ and its ee, when the ee is an event, is prototypically a simultaneous one but in specific circumstances this condition can be overridden.

I assume that any temporal differences between the perceived event and the perceiving event must be so slight as to be obscured. Our cognitive construal is that we experience an event via a sensory modality at the time of the event’s happening. In the case of direct perception where the ee of the sense of SEE is an event, it is necessary for the two events to be construed as being simultaneous even if objectively they are not. It is precisely those events that are not perceived as being simultaneous which count as indirect perception as discussed in 3.1 above.

The relationship between direct perception and simultaneity is not limited to perception verbs. It can also be found in the data discussed in Borkin (1973), discussed in 3.2.2 above. She noted that examples of FIND with a THAT-clause complement are less personal in judgement than examples of FIND with a TO BE xcomp, which was in turn less personal than FIND with a non-verbal xcomp.
Examples like (64), are accounted for if we recognise that FIND has two senses, one of which selects for a propositional ee, the other of which selects for a situational one.

(64) a. for 5 minutes I found it comfortable
    b. !for 5 minutes I found that it was comfortable

It is possible for (64a) to be temporally bounded because the subordinate situation is temporally boundable but it is not possible for (64b) to be temporally bounded because the subordinate proposition is not boundable; propositions are stative. When we have the sense of FIND that has a situational ee, we can see that the time of the referent of the xcomp and the time of the referent of FIND are co-temporal. This must, in part, account for Borkin's observation. There is a default assumption that the referent of an xcomp which refers to a situation and the referent of its head are co-temporal.

3.5 The aktionsart of SEE

The problems in analysing the aktionsart of SEE are specifically related to the inability of 'see1' to occur in either the simple present or the present progressive felicitously. If 'see1' were stative, all instances of 'see1' should be in the simple present tense. If it were dynamic they all should be in the present progressive. As it is, present instances of 'see1', which refer to the time of the utterance, have to occur with CAN in a usage which is typically reserved for mental verbs. There is some disagreement with this evaluation in Sag (1973).

In this section, I discuss the reasons why SEE has a peculiar aktionsart, relating its aktionsartal idiosyncrasies to its force-dynamic character, its thematic nature and its property of co-variance with the percept. Section 3.5.1 discusses the Vendler/Dowty typology of aktionsarts and their features; it also presents Brinton's (1988) feature-matrix approach to aktionsarts. Brinton's feature matrix is usefully flexible because it offers an elegant way of cross-classifying different aktionsartal possibilities while avoiding the hierarchical approach implicit in Kenny (1963), Vendler (1967), Dowty (1979) and Mourelatos (1978). Certain of these
subcategories, which are intended to be mutually excluding, refer to the same feature. A feature network makes it possible for there to be cross classification in terms of a limited set of features without claiming that different aktionsartal classes are organised hierarchically.

Section 3.5.2 discusses ‘see1’ in terms of the different diagnostics for aktionsarts and section 3.5.3 presents my conclusions about the aktionsart of ‘see1’. In brief, I conclude that ‘see1’ does not have an aktionsart, or rather than it is underspecified for its aktionsart, and that the reasons for the underspecification are implicit in the thematic and force-dynamic composition of ‘see1’.

3.5.1 The Vendler/Dowty typology

Vendler (1967) analyses verbs into the following categories on the basis of their aktionsart: states; activities; accomplishments; achievements. Dowty (1979: 184) revises this list into states, activities, single changes of state, and complex changes of state. He claims that all of these classes have agentive and non-agentive variants. In the literature, for example Pustejovsky (1991), Jackendoff (1991), and Tenny (1992), the Vendler categories have been taken as the starting point for analysing aktionsart.

No one has followed Dowty’s revision and, consequently, when I refer to the Vendler/Dowty typology, it is to the classification in the first sentence of this paragraph. It is this classification which has come to be known as the Vendler/Dowty classification.

States are exemplified in (65), activities in (66), accomplishments in (67), and achievements in (68).

(65)  a. Jane knows the answer
      b. Jane loves Peter

(66)  a. Jane is running
      b. Jane is playing silly buggers

(67)  a. Jane climbed the mountain
      b. Jane won the race

(68)  a. Jane recognised her long-lost father
b. Jane suddenly understood the proof of Fermat's theorem

States are opposed to dynamicity; all of the other possible classifications are dynamic. Activities are atelic dynamic situations; accomplishments are telic dynamic situations and achievements are telic, punctual (and possibly dynamic) situations.

It is clear that the Vendler/Dowty classification is inadequate. It does not admit of alternatives and it does not consider what the source of the different aktionsarts might be. Dowty's diagnostics for both Vendler's classification (1979: 60) and his own classification (1979: 184) imply that the classification of verbs' senses into different aktionsarts can be attributed to underlying semantic elements. It is these elements that Brinton's (1988) discussion is centred around. Palmer (1974) offers an account which is similar to Brinton's.

There is a further problem with the Vendler/Dowty typology. The classification of aktionsarts on these grounds does not strictly limit itself to what is inherently encoded in a verb's sense. It is clear that verbs like CLIMB are classified as accomplishments or activities depending on whether they have a direct object or not. The class of accomplishments is one that is entirely contingent on the presence of a direct object. It appears, therefore, that the Vendler/Dowty typology is, as Brinton (1988: 30) suggests, a classification of sentence types rather than of verb senses. This point becomes even clearer if we consider that activities can be made into accomplishments by the addition of a direction phrase. For example, the sense of RUN is an activity but run to the shops refers to an accomplishment.

It is with these anxieties in mind that Brinton (1988: 57) presents her featural cross-classifying system for accounting for different aktionsarts. This has been discussed in 1.2.5. She claims that a situation type can be classified into: +/- dynamic; +/- telic; +/- durative; +/- homogeneous; +/- multiple. Furthermore, a situation can be classified in terms of more than one of these features. The main feature that concerns my discussion here is whether 'see1' is dynamic or not. (+/- dynamic is the converse of +/- stative.) We have already seen that the telicity and duration of seeing vary with the percept. There is no inherent telicity, or atelicity of 'see1', and 'see1' can be punctual or durative according to the duration of its percept. The semantic features
that are appropriate to the aktionsart of ‘see1’ are, therefore, +/- dynamic, +/- homogeneous, and +/- multiple. But first, we have to see whether these features are relevant to an analysis of aktionsart.

The feature +/- dynamic is precisely what is at issue when we look at the question of why SEE/ ‘see1’ cannot felicitously occur in the present tense as either a simple verb or a progressive one. +/- Homogeneous is introduced to cover the same territory that Palmer (1974) covers with his notion of “phase”. This deals with the issue of whether all of the internal stages of a situation resemble one another or whether there is some change over time. Homogeneity is not exactly the same as stativity. In (69), for example, the verb FLOW is used statively and dynamically.

The referent of both flows in (69a) and flowing in (69b) is homogeneous: all phases of the situation resemble all other phases of the situation.

(69)  a. the river flows through Sussex
      b. the river is flowing very fast since the rain

We can see, therefore, that it is possible for a verb with a dynamic referent to be homogeneous. Dynamic adjectives, mentioned above in 3.3.4 are also homogeneous.

Even before investigating further, it seems as though the potential of ‘see1’ to be homogeneous varies exactly with the ee of ‘see1’. If the temporal duration of the situation referred to in (70a) lasted from t1 to t10, t3 and t9 should be differentiated only in that t9 is later than t3. In such a case ‘see1’ is homogeneous. But if the situation referred to in (70b) lasted from u1 to u10, the experiences at u3 and at u9 would be different experiences.

(70)  a. Peter saw Dürer’s portrait of his father
      b. Peter saw Jane eat an ice-cream

It is fair to assume that there is no inherent homogeneity in ‘see1’. It is also clear from the examples in (70) that the problem of the dynamicity of ‘see1’ is not related
to whether it is homogeneous or not. If the main verbs in (70a-b) were present tense, they would be equally bad in the simple and the progressive forms of the present.

Multiplicity is only a property of verbs with punctual referents. Some punctual verbs, like WIN can only have referents which refer to a single instance of that verb. Bill Clinton could only win the 1992 presidential race on the occasion that he won it. Other verbs, like HIT can refer to multiple instances of the verb. In *Jane was hitting Peter* we assume that there was more than one instance of Jane’s hitting Peter. As ‘see1’ is not inherently punctual, multiplicity is not relevant to the discussion here.

The relevant question, therefore, concerns the dynamicity of ‘see1’. Is it dynamic or not? In the next section I show that ‘see1’ is neither dynamic nor stative, I show that it has no inherent telicity, and I show that it has no inherent durativity. ‘see1’ is underspecified in terms of its aktionsart. However, we shall see that the most significant element is dynamicity. The reasons why ‘see1’ is underspecified in terms of its dynamicity have to do with its thematic and its force-dynamic nature.

In terms of the wider picture, two important points arise. The first is that not only are the Vendler/Dowty classes composed of smaller elements but also the building blocks of the basic elements of the aktionsarts are themselves derived of other semantic elements. The second is that, given that aktionsarts are themselves derived phenomena, those theories that seek to handle linking in terms of the aktionsart of a particular verb are bound to prove inadequate: at the very least they do not attempt to describe the semantics that they are linking to syntax in a sufficiently accurate way. This criticism applies in particular to the theories reported in Grimshaw (1990), Pustejovsky (1991) and Tenny (1992).

The diagnostics that Brinton (1988: 30) and Dowty (1979: 60) provide can be classified according to what aktionsartal feature they test for. 3.5.1.1 discusses duration tests, 3.5.1.2 discusses telicity tests, 3.5.1.3 discusses homogeneity tests, and 3.5.1.4 discusses the tests for dynamicity.
3.5.1.1 Duration tests

The following diagnostics determine whether a situation is durative or not. They do not distinguish between punctual situations and durative ones, although they do distinguish between punctual situations that can be iterated and those that can only happen once.

(71)  
   a. verb for an hour  
   b. spend an hour verbing  
   c. verb can be the complement of STOP

The diagnostics in (71) are diagnostics which apply to the Vendler/Dowty classes of states, activities and achievements. States are inherently durative, activities are durative events, and achievements are change of state verbs where the situation which gives rise to the change of state has duration and the sense of the verb is the activity which gives rise to the change of state. SINK, as analysed in Hudson (1990: 152-156), is an achievement. The diagnostics will apply to iterated punctual events, too.

I have already shown in section 3.4.2 that ‘see1’ is underspecified for duration and that its duration varies with the duration of its complement. When we apply the diagnostics to SEE we see that this is definitely the case. Dowty gives (72a-b) as alternative tests for duration.

(72)  
   a. for a few seconds, Jane saw the bank-robbers in her door-mirror  
   b. Jane stopped seeing the fireworks after mummy and daddy made her draw her curtains

The examples in (72) show that ‘see1’ can be durative if its complement is amenable to its having a durative interpretation.

(73)  
   a. !for a few seconds, Peter saw the pin drop  
   b. !Peter stopped seeing the car crash
The examples in (73) show that ‘see1’ is not durative if its complement is not. The
durativity of ‘see1’ is hardest to establish when SEE has an object that refers to a
physical thing. In these cases, SEE is most appropriate with temporal adverbials
which indicate short duration, as in (72a). One of the reasons for this is found in the
nature of the telicity of ‘see1’ which I explore in the next section.

3.5.1.2 Telicity tests
Telicity is extensively discussed in Jackendoff (1991). It is a semantic category that
cuts across thematic structure and temporal structure because a theme can be telic or
atelic, a path can be telic or atelic and an event can be telic or atelic. States are
inherently atelic. The temporal telicity of an event can be constrained by the telicity
of the theme or the path of that event. We have seen that the path of ‘see1’ is telic in
as much as it is bounded by the percept and perceiver’s respective locations. It is
unclear whether the gaze of seeing is a unitary element, or whether it is co-extensive
with the path of seeing. However, ‘see1’ is unique among verbs that have an element
of movement in their senses in that the passage of the theme along the path does not
constrain the duration of a seeing situation.

This state of affairs is quite different from what happens with WALK or
CLIMB for example. Once these verbs have a path expression structured into their
semantics, as in walk to the shops or climb the tree, they become temporally telic.
The thematic nature of ‘see1’ does not affect the duration of an instance of SEE, no
doubt because no part of the thematics of ‘see1’ is grammatically expressed directly.

I have already shown that the duration of an instance of SEE/’see1’ lasts for as
long as its percept. The working assumption, on the basis of the existing analysis of
the telicity of ‘see1’, must be that it is underspecified as far as its temporal
boundedness is concerned, and that this underspecification is a direct consequence of
the way in which the thematic nature of ‘see1’ is structured into its semantics without
being syntactically reflected.

Clearly the question of whether SEE/’see1’ is telic or not is related to the
question of whether it is durative or not, so part of the issue under discussion lies in
the question of the duration of SEE/'see1'. With the duration of an instance of SEE/'see1', it is clear that it is conditioned by the percept. This cannot be the whole story with the telicity of an instance of SEE/'see1'. We might expect an instance of SEE with an infinite percept to last for ever, but the embodiment hypothesis suggests that it is in the telicity of an event of seeing that the physical nature of seeing is important. It would be impossible to see the same percept indefinitely. Any act of seeing is contingent on the perceiver being orientated in the direction of the percept and the nature of physical orientation is unstable. All instances of seeing should have a natural endpoint which is conditioned by the subject of the verb.

The Vendler/Dowty telicity diagnostics (Dowty 1979: 60) are given in (74).

(74) a. can you V in an hour/ take an hour to V?
    b. can the verb be the complement of FINISH?
    c. Does x is Ving entail x has V-ed?
    d. is a past tense instance of the verb ambiguous with ALMOST?
    e. does x Ved in an hour entail x was Ving during that hour

(75)-(79) give instances of SEE/'see1' put through these diagnostics. The diagnostic in (74c) is a test for an atelic sense. If the entailment holds the sense of the verb is not a telic one.

(75) a. Peter saw Jane cross the road in 5 seconds flat
    b. !Peter saw Jane crossing the road in 5 seconds flat

The first example is telic because it is temporally bound by the perfectivity of the subordinate clause. The second is not, however, because it is temporally located in the middle of the crossing the road event. In (76), the same relationship holds between the bare infinitive xcomp of saw and the -ing participle.

(76) a. Peter finished seeing Jane cross the road
    b. !Peter finished seeing Jane crossing the road
The data in (75) and (76) are further evidence in favour of my claim that the difference between bare infinitive xcomps of instances of SEE and their -ing participle xcomps is a simple matter of telicity or atelicity.

It is only possible to get present progressive instances of SEE when the sense of the instance of SEE is 'image forming' and does not include the gaze element. Otherwise, it is not possible to get present progressive instances of SEE. There are some examples of the diagnostic in (74c) in (77).

(77) Jane is seeing stars entails Jane has seen stars

(74c) is a diagnostic for atelicity and so we can be sure that 'image forming' as a sense of SEE is not telic. This information is not relevant to 'see1'.

The ALMOST test in (74d) shows that SEE with bare infinitive xcomps is telic and with -ing participle xcomps it is not. Yet again, this reinforces the analysis of these different kinds of xcomp above.

(78) a. Jane almost saw Peter cross the road
    b. Jane almost saw Peter crossing the road

(78a) is ambiguous between an interpretation where Jane did not see Peter's road crossing event completed and an interpretation where she failed to see any part of the road crossing event. The ambiguity is the same as the one in *I almost walked a mile* which could mean that I fell in the last few yards or that I could not be bothered to get out of my armchair. (78b) is simply not ambiguous.

The final diagnostic is not relevant because of the incompatibility of SEE with the present progressive.

I have shown that the telicity of SEE is exactly the same as that of the referent of the xcomp of an instance of SEE. In the case of a direct object it is harder to see how the telicity of an instance of SEE would be conditioned. As a working hypothesis, I assume that 'see1' has no inherent telicity. In the case of an instance of
SEE with a direct object, one constraint would be the ability of the perceiver to maintain a gaze. Given my initial working assumption that the meaning of SEE is directly embodied, I assume that all instances of physical perception have to end. It is obviously not possible to maintain a gaze indefinitely.

Not all of the tests are applicable with instances of SEE and a direct object. The take an hour test often implies a sense of SEE which means 'go to see'. The two diagnostics using present progressives are not relevant. The examples in (81), however, all give instances of SEE which are potentially telic.

(79) a. Jane took a day to see all the Parthenon friezes
    b. Jane finished seeing the Parthenon friezes
    c. Jane almost saw the Parthenon friezes

The inference that I draw from this is that the telicity of 'see' is conditioned by its ee, irrespective of the category of the element that the ee is the referent of.

3.5.1.3 Homogeneity

Brinton (1988: 56-57) claims that both states and activities are homogeneous. In her system, homogeneity is analogous to countability in nouns. The sole diagnostic for homogeneity is given in (80).

(80) V for an hour entails V ed at all times in the hour

We can see that FLOW has a stative and a dynamic sense, but that both senses are homogeneous, as the example in (81) shows.

(81) a. the water flowed over the weir
    b. the water was flowing over the weir
    c. the Thames flows through London
As I pointed out in 3.5.1, the homogeneity of ‘seeI’ varies exactly with the nature of the percept.

(82)  a. For an hour, Peter saw Jane climbing
       b. For an hour, Peter saw Jane climb

Both of the examples in (82) are homogeneous but if the xcomp is given a direct object, only the -ing participle xcomp example fulfil the entailment in (84).

(83)  a. for an hour, Peter saw Jane climbing the mountain
       b. for an hour, Peter saw Jane climb the mountain

It is clear that ‘seeI’ is underspecified for its homogeneity, too.

3.5.1.4 Dynamicity

Dynamicity is different from the other elements of aktionsart because it is not conditioned by the ee of the sense of the verb. ‘seeI’ is unmarked for dynamicity; but whereas the absence of marking for an aktionsartal category is not problematic as far as the other categories are concerned, it is problematic in the case of dynamicity. A situation is classified in an isa hierarchy, and its classification as a dynamic or a stative situation is central to the grammar of the progressive in English. A situation that is not dynamic and that is not stative is uniquely very near the top of any isa hierarchy. The fact that HEAR-class verbs do not inherit from any other elements is important in demonstrating that they are not a species of perception, but that they are a unique class of verbs. I present diagnostics for dynamicity drawn from Dowty (1979: 55-6) in (84).

(84)  a. only dynamic verbs occur in the progressive
       b. only dynamic verbs occur as the complements of FORCE and PERSUADE
       c. only dynamic verbs occur as imperatives
d. only dynamic verbs occur with DELIBERATELY and CAREFULLY

e. only dynamic verbs occur in pseudo-cleft constructions with DO

f. dynamic verbs cannot occur in the present tense with present time, non-
habitual, non generic, non-instantaneous time-reference

These diagnostics are not without their problems. If we take a verb such as LIKE, we
can see that it gives a mixed response to the diagnostics.

(85)  a. !I am liking toffee
    b. I persuaded Jane to like toffee
    c. like toffee or die!
    d. !I deliberately/ carefully like toffee
    e. !what I did was like toffee
    f. I like toffee

According to the progressive, manner adverb, pseudo-cleft, and simple present tense
tests, LIKE is not dynamic; according to the PERSUADE and imperative tests, it is.
It is necessary to bear in mind that the diagnostics may not all be testing for the same
element. And !like toffee is less acceptable than !like toffee or die is, in (85c).

Bearing these caveats in mind, the diagnostics are not clear with SEE.

(86)  a. !I am seeing Peter crossing the road
    b. !I persuaded Peter to see Jane crossing the road
    c. !see Jane crossing the road
    d. !Jane deliberately saw Peter crossing the road
    e. !what he did was see Jane crossing the road
    f. !Peter sees Jane crossing the road

According to the examples in (86), SEE/"see1" is not stative and it is not dynamic. I
chose examples with SEE complemented by a direct object and an xcomp in order to
avoid the potential interpretation 'go to see' of SEE + direct object strings.
The problem that the analysis of SEE faces is that it has some of the characteristics of a dynamic verb without having all of them. Prototypical dynamic verbs, like HIT, RUN and BEAT involve bounded themes traversing telic paths. They involve a force opposition between the er and the ee. Other dynamic verbs, like BEGIN do not have a thematic relationship between the sense of the verb and the referent of the subject but there is a force-dynamic one. The referent of the subject of an instance of BEGIN is in a force-dynamic opposition with the referent of the xcomp of BEGIN. We have seen that there is a relationship between the force-dynamics and the thematics of SEE/'seel' so that the theme of 'see1' is the antagonist of 'see1' and the referent of the subject is the agonist. In normal circumstances, this would mean that 'see1' was dynamic: the only cases where a verb with a thematic element in its semantics is not dynamic involve themes that are co-extensive with the paths of the sense of the verb. Although we have seen that the first theme of 'see1' may possibly be co-extensive with the path of 'see1', the second or percept theme cannot possibly be so.

There is a further reason why 'see1' is not ordinarily dynamic. As Croft (1991) cogently argues, force-dynamic relations form chains. The chain of force transmission in 'see1' is broken, however. As a consequence, the referent of the object is not the antagonist of 'see1'. As the force-dynamic chain is reversed in the case of 'see1' it violates the prototypical characteristics of force-dynamic relations, leading to a situation where 'see1' is dynamic, but so non-prototypically so that it does not meet the conditions of dynamic verbs. The upshot is that 'see1' is classed as a non-prototypical dynamic meaning, with the result that, to all intents and purposes, it is neither dynamic nor stative.

3.5.2 Aspectual conclusions

The irregular conclusion is that 'see1' does not have an aktionsart. To the extent that it is punctual or durative, telic or atelic, homogeneous or non-homogeneous, or multiple or not, the complement of the instance of SEE determines the outcome. As far as the dynamicity of 'see1' is concerned, the outcome is set by the thematics and the force-dynamics of 'see1'. I have argued that, uniquely, it is neither stative nor
dynamic, not because it is not classed as one or the other in an isa hierarchy, but because it is classed as dynamic, while having so many elements in its meaning at odds with such a classification that the analysis of 'see1' as dynamic is entirely at odds with every element in the grammar of 'see1', barring its not being a state. All of the facts about the aktionsart of 'see1' are consonant with my initial hypothesis that 'see1' is a consequence of the direct embodiment of perception and our experience of seeing. There are a number of contradictory facts about 'see1', especially in its thematics and force-dynamics, and these give rise to the aktionsart of 'see1'.

3.6 SEE and CAN

The relationship between SEE and CAN when SEE means 'see1' is peculiar because if I can see the picture entails that I fulfil all the conditions for seeing the picture at the time of speaking. CAN makes instances of SEE possible in the present tense with present time meaning.

UNDERSTAND is one of the few other verbs with which CAN has this kind of relationship. REMEMBER is another. Unlike SEE, UNDERSTAND is otherwise stative. When it collocates with SEE and UNDERSTAND in this way, CAN does not have a modal sense. It is neither epistemic nor deontic. What it means is that there is a force-dynamic relationship between the referent of the subject and the sense of the verb which is the xcomp of CAN. It makes it possible to interpret SEE with present time meaning. However, CAN is stative, therefore making the string CAN + SEE apparently stative. This means that instances of CAN + SEE are durative and that they maintain the majority of the qualities of stative verbs, although these qualities can be overridden by the properties of the xcomp of SEE.

3.7 Other HEAR-class perception verbs

In this section, I present diagrammatic analyses of the other HEAR-class verbs which focuses on their physical perception senses. There are certain obvious differences (in thematic structure) between these verbs and 'see1', but the force-dynamics of the verbs are all the same. They all share their aktionsart with 'see1', and their behaviour with CAN is the same as that of SEE. Given the embodiment hypothesis, and given
that SEE is the most extraordinary of these verbs because of its thematic nature, I hypothesise that the senses of these verbs are all instances of 'perceiving' and that they are distinguished by the different physical nature of perception. Wierzbicka (1980) makes a similar claim. In the diagrams, I detail the different physical nature of each kind of perception using a 'channel' relation.

3.7.1 HEAR

HEAR is not a verb which has a theme, nor, unlike SEE is it a verb of orientation. The examples in (87) are unacceptable.

(87)  a. *Peter heard into the room
     b. *Peter heard to the wall

'Hear' does involve a sensory image of the percept travelling into the hearer's consciousness as in (88).

(88)  Jane heard Peter crying through the wall

'Hear' involves distal perception.

(89)  Jane heard Peter from miles away

The semantic structure of 'hear' is given in Figure 3.16.
The diagram in Figure 3.16 makes a number of claims. First, it claims that the sense of heard, c2, is an instance of 'perceiving', (this means that c2 inherits mits meaning from 'perceiving'). However, although hearing is a kind of perception, it is a kind of perception with a result: the perceptual trace of the image moves and an image is formed by the perceiver.

C1 is the referent of Jane. It is also the er of c2, the sense of heard. C3 is the referent of Peter and the ee of c2. The result of c2 is an instance of 'moving'; but what moves is not the referent of Jane, nor is it the referent of Peter. The er of 'moving' is c4. C4 is the perceptual/trace of the referent of Peter. This relationship is captured by the fact that c4 is in an 'image of' relationship with c3. C3 is the referent of Peter.

C5, the instance of 'moving' has a result: c6, which is an instance of 'image-forming'. The ee of c6 is c4, the perceptual trace of the referent of Peter. That is, the diagram claims that an image is formed of the perceptual trace of Peter, which is, in the case of hearing, whatever was audible about Peter. The er of c6, the image-former, is c1, the hearer, the referent of Jane. The diagram therefore states that Jane hears Peter by forming a mental image of Peter's sound as a consequence of some sound of Peter's entering her consciousness.

There is one part of the diagram that remains unexplained. C7 is an instance of 'ear' and it describes the body-part involved in this kind of perception. C7 is in a 'body-part' relation with c2, the sense of heard. That is, the diagram claims that hearing is a kind of perceiving that involves a particular body-part, the ear.

The main claim of the diagram in Figure 3.16 is that hearing, like seeing is complex. It involves the physical world, and a mental image of the world, and what is heard is not necessarily, the referent of the object of an instance of HEAR.
3.7.2 FEEL

FEEL is polysemous; it has a variant which is a 'touching' as in *Jane felt her way to the lightswitch*. The examples in (90) show that 'feel' has a theme.

(90)  
   a. Jane felt to the wall  
   b. Jane felt over her face

However, it also has a themeless variant as in *Peter felt a pain in his side*. As the examples in (90) could both be progressive and could both collocate with DELIBERATELY, I assume that the sense of FEEL which is a 'touching' is part of FEEL/A and not part of FEEL/E. I assume that FEEL/E has a themeless sense.

'Feel' also involves a sensory image of the percept travelling into the hearer's consciousness as in (91).

(91) the princess felt the pea through several mattresses

'Feel' can involve distal perception; in these cases, the sensory trace travels to the feeler.

(92) Jane felt the fire from the other side of the room

The semantic structure of 'feel' is given in Figure 17.

Figure 3.17
3.7.3 SMELL

There is no theme of ‘smell’, although there is a perceptual trace of ‘smell’.

(93) a. Jane smelt to the soup cauldron
    b. Jane smelt the roses through the overpowering smell of lavender

This is also a potentially distal sense.

(94) Jane could smell the soup from her bedroom

The structure of ‘smell’ is given in Figure 3.18.

![Diagram of 'smell' structure](image)

Figure 3.18

3.7.4 TASTE

There is no theme of ‘taste’ although there is a perceptual trace of ‘taste’.

(95) a. *Peter tasted to the garlic
    b. Peter tasted carrots through the overpowering garlic

‘Taste’ is not distal.

(96) Peter could taste garlic from the other side of his mouth
The structure of ‘taste’ is given in Figure 3.19

Figure 3.19
Chapter 4
The semantics of LISTEN-class verbs

4.1 Introduction
In this chapter I am concerned with two issues. The first is why LISTEN-class verbs are dynamic. The second is why LISTEN-class verbs differ from HEAR-class verbs so dramatically in their valency. Given that all HEAR-class verbs can be complemented by a direct object or a direct object and xcomp when they have a physical perception meaning, it is strange that LOOK/A and LISTEN have no object, and that no LISTEN-class verb can have a direct object and xcomp pattern. I am, therefore, also concerned with the issue of which part of the semantic structure of the corresponding HEAR-class verb is included in the meaning of LISTEN-class verbs.

The first issue concerns what the sense of a LISTEN-class verb is. There are two possible answers. First, it may be the same as the sense of its corresponding HEAR-class verb but with a slightly different force-dynamic structure so that the referent of the subject is some kind of force-dynamic participant, or agent. There is a simplified diagram of what such a structure would look like for LOOK/A in Figure 4.1.

Secondly, it could be some kind of action which embeds (part of) the sense of the corresponding HEAR-class verb as, say, its result. There is a diagram of this structure in Figure 4.2.
The evidence shows that the second account, shown in Figure 2, is preferable, and it is this account that I argue for. This account, however, raises a further issue: it proves necessary to find some means of distinguishing between agency as defined in terms of dynamicity and agency as defined in terms of causation. Consequently, there is a discussion of the subordination of senses that distinguishes between different force-dynamic structures in 4.2.1. One of the advantages of the subordination account is that it captures the similarities of all of the verbs concerned, namely that they are all some kind of action with dynamic aktionsart, while permitting the differences between them to emerge by restricting part of the frame for their HEAR-class counterparts which is profiled as the result of the LISTEN-class sense.

The second matter that I discuss in this chapter, the complementation of these verbs, involves sketching an account of why LOOK/A has no complement (although it regularly collocates with AT), of why LISTEN is complemented by TO, and of why the remaining verbs in this class can only have direct objects and cannot occur with the full range of complement patterns that their related HEAR-class verbs occur with.

The chapter is organised into the following sections: 4.2 The subordination of the senses of HEAR-class verbs in LISTEN-class verbs' senses; 4.3 The relationship between situation types and semantic relations; 4.4 Other theories' accounts of similar phenomena; 4.5 LOOK/A + AT 4.6 LISTEN + TO.

4.2 What the sense of a LISTEN-class verb is

First, it is important to demonstrate that Figure 4.1 cannot be a plausible model of the meaning of LOOK/A. If we take the sentence in (1a), it is clear that it is possible to listen without there being any hearing event involved at all. If we take the example in
It is clear that it is possible to look without any of the elements of the meaning of SEE being present.

(1) a. Peter listened for hours without hearing anything
    b. the blind man looked at me in a horrible way

I take it, therefore, that the senses of LOOK/A and LISTEN cannot be a force-dynamically modified variant of the sense of SEE or that of HEAR. Given that the senses of HEAR and SEE are, however, referred to in the definitions of LISTEN and LOOK/A, as purposes of the action or some kind of (non-obligatory) result, there must be a structure like that in Figure 4.2 instead.

The facts at first appear different for SMELL/A, FEEL/A and TASTE/A. Initial reflection suggests that the agentive verbs for the non-distal senses entail the meanings of their non-agentive HEAR-class equivalent. This observation is borne out by the examples in (2). They show that, even given an appropriate context, it is not possible to have instances of SMELL/A, FEEL/A and TASTE/A without some kind of perceptual meaning.

(2) a. !even after his disastrous nose-job, which left him with no sense of smell, Peter still obsessively smelt his socks every night
    b. !nobody wanted to go into the shop after they heard that the leper purposely felt all the fabrics
    c. !Jane amazedly tasted the salt, which had indeed lost its savour

On the basis of this evidence, I conclude that the sense of any LISTEN-class verb is an action which may profile part of the sense for the associated HEAR-class verb as its ee but which, in the case of LOOK/A and LISTEN, need not.

The issues are, however, not entirely simple. There is a complication with LOOK/A, related to the account of SEE in Chapter 3. I said that it was possible to

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38 The manner adverbs indicate that the verbs are agentive and that these are therefore the LISTEN-class instances of these verbs.
have structures like *Jane saw the hazard sign without noticing it*: one possibility, which becomes relevant below, is that the sense of LOOK/A is a modified variant of the sense of SEE. We shall see that this is true for, exceptionally for LOOK/A among the verbs of the LISTEN-class, in 4.5.

An account of LISTEN-class verbs which is predicated on the assumption that there is an action sense which has a state of some kind as its argument is familiar (in terms of its structure) from the analysis of intransitive OPEN in most decompositional theories, as discussed in 3.3.4, and from Hudson’s (1990) account of the semantics of SINK. For example, Hudson’s account of SINK involves a ‘going under’ situation whose result is a ‘being under’ situation. I will analyse the senses of LISTEN-class verbs in just the same way. This model is also familiar from the discussion of the senses of SEE in Chapter 3.

However, there are two problems with this analysis that need to be addressed. First, how is it possible to identify the semantic relation between the sense of LISTEN and the part of ‘hear’ that is the argument of ‘listen’. Secondly, it is necessary to distinguish this kind of semantic subordination from causation. Semantic subordination without an agentive subject is easy. But in cases where there is a structure of semantic subordination, and the subject is agentive, the verb is typically causative (and typically transitive). There is, therefore, the problem of reconciling an agentive subject with a complex semantic structure which does not model a causative structure. The problem is that it is uncertain how the referent of the subject of the verb can be agentive, at least in force-dynamic terms. Figure 4.2 does not involve causation because there is no force transmission between participants.

Once intransitive verbs can be analysed as involving more than one situation so that LOOK/A can involve an acting event and a subordinated element of the ‘seeing’ frame, it is possible to tie this to a general account of unergative verbs which involve a subordinate situation, although unaccusative verbs do not. This in turn ties to Pinker (1989: 198) which adduces an account of verbs like RUN (an unergative verb) where their semantic structure involves the subordination of a moving event to an acting event. He uses this kind of structure to capture the fact that running involves voluntary motion. The problem of agency, then, becomes generalised to the
problem of agency for unergative verbs. A WG version of Pinker's account of RUN is given in Figure 4.3.

![Diagram of RUN]

Figure 4.3

By maintaining that ee can be a relation between two situations as well as a situation and an entity, we have made it possible for a situation to be the prototypical ee, and therefore antagonist of another situation. The diagram says that c2 is "what is acted" (or perhaps enacted) by c1. Notably, Figure 4.3 says that there is a force transmission between the referent of the subject and the subordinate event. The agonist/antagonist pairing is maintained, even in the case of intransitive verbs. The force transmission is relevant to agency: the referent of the subject of the verb is a force-dynamic participant in the sense of the verb.

4.2.1 Arguments for an actional and agentive sense of LOOK/A.

These verbs were analysed in the Chapter 1 as agentive verbs. A subject's agentivity entails that the verb concerned is dynamic. The evidence that the subject is agentive is that the verbs concerned can occur with manner adverbs like DELIBERATELY; the other evidence that the verb is dynamic is that it can occur in the progressive. All of the LISTEN-class verbs can occur in the progressive and they are all able to occur with manner adverbs.

Agency is a complex semantic relation and it is not in a one-to-one relationship with dynamicity. Agency prototypically involves elements such as action, sentience, control over a situation, being the energy source of a situation, which are only partly relevant to dynamicity. If we assume that the sense of a LISTEN-class verb is agentive, as we must, we are still left with the issue of how to represent the agency of the referent of the subject. This is a question of unpacking the
er prototype and identifying what er elements are obligatory with certain situation
types and what er elements are to be found optionally with any situation type.

4.3 Semantic relations and situation types
The section concerns the relationship between semantic relations and concepts like
‘action’. There are (at least) two ways of thinking about semantic relations. I
discussed these issues in Chapter 1.

- The “semantic relation does the defining” model
  The sense of each verb is related to the referents of its dependents by the semantic
  relations that it needs. Therefore, the description “er of rolling” could include “theme
  of rolling” and also “voluntary agent of rolling” or “involuntary agent of rolling” as it
  had to. “Er of rolling” would then be a generalisation across a range of semantic
  relations, each one of which would be a primitive in the system.

- The “situation type does the defining” model
  The sense of each verb is an instance of a situation type. Each situation type is
  associated with a given semantic relation, and a given sense inherits those relations
  that the nodes above it in the inheritance hierarchy possess. Therefore, if ‘rolling’ is a
  ‘causing’, the er of ‘rolling’ will inherit the same value as the er of ‘causing’. Each
  situation type would have only one semantic relation associated with its er, and only
  one semantic relation associated with its ee.

  The first system would result in a model where it was possible to have verbs
  inheriting their properties from gross categories which were optionally associated with
  particular semantic relations. The relations would then be basic to the system, and in
  a typology of situation types it would be necessary to refer to the semantic relations
  that were associated with different situation types in order to classify the different
  situations.

  The second system gives rise to a model where every possible semantic
  relation has to be associated with a different situation type. On the one hand, we have
a large number of different semantic relations; on the other, we have an abundance of conceptual structure and situation types. An alternative model might be to employ a hybrid system, perhaps where the situation type derived semantic relations were relevant to coarse grained semantic issues, perhaps linking, and where primitive semantic relations were relevant to fine grained issues of interpretation. These issues were discussed in the context of other theories of semantic structure in 1.2.6.

In fact, a hybrid model is exactly right. It is clear that there are themes and that themes are relations defined over situation types. The theme of a situation is the er of any situation which is a 'going'. For as long as a situation involves 'going', its er is a theme. Furthermore, the two sorts of 'going' situation are constrained in terms of the kind of theme that they have. A stative 'going' situation, exemplified by *the road goes to Ely*, has an unbounded er. A dynamic 'going' situation, exemplified by *Jane is going to Ely* has a bounded er. So we can see that as far as thematic relations are concerned, the kind of semantic relation is defined in terms of the kind of situation. Additionally, the nature of the er relatum is related to whether the situation is dynamic or not. (Stative situations have unbounded themes, dynamic situations have bounded themes, but whether this interrelation is due to the theme or the situation is unclear.) A bounded theme is a sufficient, though not a necessary condition of dynamicity.

On the other hand, it is clear that force-dynamic relations are independent of situation types. As Talmy (1985b, 1988) shows, states and dynamic situations may both involve force-dynamic relationships and, as we saw in the previous chapter and shall see in the next chapter, force-dynamic relationships are not necessarily co-extensive with the er and the ee of a situation. A situation needs to have a force input to be dynamic; that is, a force-dynamic participant is a necessary, though not a sufficient condition of dynamicity. We need, therefore, to establish a semantic model which recognises the differences in the alternative kinds of semantic relation and exploits those differences.

Let us assume that the difference between dynamic situations and stative situations is basic and that the distinction is handled in terms of force-dynamic relations. Given that the agonist/antagonist pairing can apply equally well to states, it is necessary to have a force-dynamic relation which distinguished states from non-
states. This relation is the force-dynamic relation "instigator" which is the participant that overcomes the natural inertia that constitutes the initial state of any dynamic situation. On this account, events are distinguished from states because their ers conflate the semantic relation of instigator. Instigator would apply to "on-stage" participants in a situation, so in an example like the stone broke the window 'the stone' would be the instigator because it would be the stone's energy that was responsible for the fact that 'break' isa action rather than isa 'state'. In a dynamic situation with an agonist/antagonist pairing the er is therefore the agonist and the instigator. On a decomposition account of unergative verbs, as discussed in 4.1, the instigator is an agonist whose antagonist is a situation. However, we need the relation instigator, independent of agonist/antagonist pairings, to account for unaccusative verbs.

The advantage of such an account is that we could have a unified account of dynamic aktionsart. On such a view, a situation would have dynamic aktionsart just in case its er was a force-dynamic participant. If it were a 'going' situation it would additionally have a bounded theme. With such a model of the relationship between aktionsart and force-dynamics, it would be possible to explain some of the linking regularities that scholars like Dik (1980), Grimshaw (1990), Pustejovsky (1991), Tenny (1992), and others describe in terms of the aktionsartal category of the situation entirely in terms of the semantic relations that a situation has. As I said in 1.2.9, such an account has to be preferable to a model based on situation types because it permits a series of linking rules that predict from er and ee (and other relations) directly onto syntactic relations. An aktionsart based view of linking requires a layer of additional structure: a statement of how situation types are resolved into relations (i.e. argument structure).

Given such a model of the relationship between semantic relation and situation type, it is necessary to identify the range of relations that the er prototype conflates. We shall see that ers can involve a range of different relations, not all of which are available at any given time. The account of er as a prototypical relation type
described here is reminiscent of Dowty (1991)\textsuperscript{39} but it is not exactly the same as Dowty's model; among other things, Dowty described his class of proto-agents in terms of conditions on the agent-entity. I am here discussing er as a prototypical relationship and consequently my discussion of ers does not presume an account of what a prototypical er entity may be.\textsuperscript{40}

4.3.1 Unpacking the er prototype

We have seen that an er may or may not be an agonist, and we have seen that it may or may not be an instigator. If we look at intransitive ROLL, which Jackendoff (1990: 128-129) discusses, we can see that in all cases 'roll' is dynamic. However, this use of ROLL is semantically complicated because there are a number of possible interpretations. In this section, I question which of those interpretations needs to be accounted for in the model, and I identify a further element in the er prototype.

Jackendoff claims that there are three interpretations of (3), which I have given in (4).

(3) Bill rolled down the hill [=Jackendoff's 15]

(4) a. Bill is the wilful doer of the action
   b. Bill is the involuntary doer of the action
   c. Bill is the undergoer of the action

The interpretation in (4a) is brought out in (5a); that in (4b) is brought out in (5b); and that in (4c) in (5c).

(5) a. Bill deliberately rolled down the hill
   b. Bill accidentally rolled down the hill
   c. Bill rolled down the hill after being stuffed in a barrel and pushed

\textsuperscript{39} There are also similarities with Schlesinger (1989, 1992), which treat agency as a prototypical relation.

\textsuperscript{40} A relationship can, of course, place limitations on what its relatum may be. For example, subjects have to be nouns or pronouns usually, (although there are exceptions).
That is, in all of the cases in (5), 'roll' is dynamic; it is an action. But it is not the case that the semantic relation between 'roll' and 'Bill' is the same in all of the examples. Certainly, 'Bill' is the theme in all of the cases, but in (5a) 'Bill' is an agent; in (5b) 'Bill' is a non-agentive er; and in (5c) 'Bill' is not doing anything at all (although the verb is still dynamic). Let us ignore the example in (5c) for now. The claim in (4c) is a red-herring in that it is an example of what Jackendoff (1990: 294) calls a "discourse patient" as I noted in Chapter 3. In section 4.3.2 below, I claim that no dynamic verb can have a subject which is a semantically encoded, as opposed to a pragmatically inferred, example of an undergoer. Patient subjects are always discourse patients. LISTEN-class verbs cannot have genuine undergoer subjects.

We have seen that the subject of a LISTEN-class verb can be an agent, like the subject of rolled in (5a). Like the subject of rolled in (5b), the subject of a LISTEN-class verb can be an involuntary er too, as the data in (6) show.

(6)  a. Jane unintentionally looked at Medusa
    b. Jane unintentionally listened to the spies' discussion of their nefarious activities, and thus jeopardised her safety
    c. Jane was unwillingly feeling how the sharp tip of her assailant's knife blade threatened to separate her vertebrae
    d. Jane was (quite unintentionally) smelling filled nappies
    e. Jane was unintentionally and unwillingly tasting the bitter gall of fear

The data force us, therefore, to be able, at least, to account for an er that is voluntary and one that is involuntary.

Jackendoff (1990) captures the difference between voluntary and involuntary ers in terms of a feature that applies to the equivalent of the er entity in his system. Such an opportunity does not offer itself in WG because there is no feature

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41 Examples (6c-e) are perhaps less felicitous than (6a-b). This is because it is necessary for them to be progressive, in order to establish that these are not cases of the HEAR-class variants of these verbs. There is no such requirement with LOOK/A and LISTEN.
mechanism which can apply to relata. The only way of capturing the difference between a voluntary and an involuntary use of a verb is by the addition of a new semantic relation. Let us call a volitional er a "volunteer". Conditions on volunteerhood include the possibility for the situation to be under the control of its participants.

We have seen, therefore, that agency requires an er which is a force-dynamic participant. In addition to being the instigator, the er may, or may not be an agonist and it may or may not be a volunteer.

(7) shows that a subject can be agentive without being a volunteer.

(7) the horse ran in five races

In (7), 'the horse' is an agonist because according to the analysis presented in Figure 4.3, there is a force opposition between the superordinate and the subordinate events. 'The horse' is the agent of 'running'. It is the er of the action, and it is the energy of the horse that overcomes natural inertia; therefore 'the horse' is the instigator of the situation.

There are two statements to make about the subject of a LISTEN-class verb. Its er is its instigator; this makes the situation a dynamic one. However, its instigator need not be its volunteer. Any LISTEN-class verb may be involuntary.

There is one, final, complication. In the case of LOOK/A and LISTEN, what is voluntary or involuntary in the examples in (6) is the action itself. In the case of FEEL/A, SMELL/A and TASTE/A the state of affairs appears to be more complicated in that what is involuntary is perhaps not the action, but the fact that the action entails some kind of HEAR-class resulting situation. So the volunteer relation may only apply to the examples in (6a) and (6b).

In conclusion, we have seen that the sense of a LISTEN-class verb is dynamic and that its er is the instigator. The er may or may not be a volunteer. We need to link dynamicty to a semantic relation in order to capture the association between dynamic situations and agentive subjects.
4.3.2 Discourse patients and undergoer subjects

In this section, I examine the phenomenon of discourse patients and whether it is possible for the ers of LISTEN-class verbs to be genuine undergoers or not. One of the major tests of these verbs is whether they can occur in the progressive or not: the progressive indicates that we have a LISTEN-class verb rather than a HEAR-class verb in those cases where the form of the verb in both classes is exactly the same. However, where there is a test for the patienthood of the subject it is impossible to have the progressive, and so it is quite impossible to see which of the classes of verb is involved. There is an interesting interrelation between the progressive and what the subject is patient of.

(8) a. Jane was feeling the fabric's textures
b. what Jane did was feel the fabric's textures
c. what happened to Jane was that she felt the fabric's textures
d. what happened to Jane was that she was feeling the fabric's texture

*(when a policeman walked into the room)

(8d) is only a possible element within a sentence of English. It is not possible as a sentence of English in its own right, because it is quite impossible to capture that the activity of feeling the fabric's textures (as signalled by the progressive aspect) was something that could happen to Jane, hence the string what happened to Jane was that she was feeling the fabric's texture can only make sense in a situation where the situation in the progressive temporally frames another event.

In such a circumstance, the patienthood of Jane is not brought about by the situation of feeling, nor is it brought about by the situation of a policeman walking into the room, it is in fact a relationship between the two situations brought about by the situation of the policeman walking into the room at a time when Jane is feeling the texture of the fabric. The patienthood of Jane in (8d) is that of a discourse patient.

We need to be able to distinguish between patienthood as established in terms of the overall discourse and patienthood as established in terms of a verb’s semantics.
There are examples of subject patients for which we can use the ‘what happened’ test as in (9).

(9) what happened to Jane was that she received a huge shock when she saw her phone bill

Verbs like *received* are not dynamic and there are no dynamic verbs that can occur in this kind of environment and have patient subjects. Genuine patient subjects are always the subjects of stative verbs.

In my example (10a) the agentive aspects of the semantics of LOOK/A are overridden:

(10) a. what happened to Jane was that she looked at the Medusa
    b. !what happened to Jane was that she was looking at Medusa

We can agree that this is a case where the patienthood of *Jane* is a discourse phenomenon. What makes *Jane* a potential patient here is that we are aware that looking at the Medusa entails an unfortunate end: turning to stone. Hence (9a) is a plausible sentence of English. (10b) shows that it is not possible for LISTEN-class verbs to have patient subjects when the grammatical context insists that they are dynamic.

It is clear that Jackendoff is wrong to claim that ROLL has a possible patient subject. The type of patient subject that you get with ROLL is a discourse patient, just as you get with, for example, CAUSE and other verbs that conflate a causative element like transitive MELT as in (11).

(11) a. what happened to Jane was that she caused her sister to die
    b. what happened to Peter was that he melted his gold watch

No doubt the two examples in (11) are both ways of expressing patienthood, but neither of them is a patient of the sense of the verb. They are both patients of the
overall discourse situation. What is needed is a distinction between the kind of patienthood that a verb brings with it and the kind of patienthood that is inferred from the overall utterance.

There is no way that any of these verbs can have a patient subject except as a discourse patient and any actional verb can have a discourse patient as its subject. The only question now is what the force-dynamics of the subjects of FEEL/A, SMELL/A and TASTE/A might be: is it the same as the force-dynamics of the subject of LOOK/A? In principle, given that the aktionsarts of the verbs in this class are all similar, there should be no difference between them in terms of the force-dynamics of their subjects. All the verbs in this class have the same semantic relations with their subjects, at least in part.

4.3.3 The force-dynamics of LOOK/A and LISTEN
As I have established that 'look' is dynamic and that its er is an instigator, there is nothing further to add about the force-dynamics of 'look'. As LOOK/A is intransitive, and as 'look' does not entail that there should be a perceptual situation taking place, there can be no agonist/antagonist opposition in the sense of LOOK/A. The same is true for LISTEN. I assume that the er of 'look' is an instigator on the grounds that it has a subordinate situation as its ee, and that the force-dynamic relations are the same as for 'run' in Figure 3.

4.3.4 The force-dynamics of FEEL/A, SMELL/A and TASTE/A
The issue is whether the transitivity of the remaining verbs in this class affects their force-dynamics. In principle, a subject/object pairing makes it more likely that there is an agonist/antagonist pairing in the semantics. We see below that these verbs are not force-dynamic in the traditional sense. However, first it is necessary to identify a plausible diagnostic of a force-dynamic relationship in a transitive verb.

I have shown that the "what happened" test is not ideal when investigating the patienthood of subjects, and any diagnostic that can make the subject of causative verbs appear to be a patient must be unreliable in looking at the patienthood of objects. The ability of a verb to occur in a resultative construction is, however, an
excellent diagnostic of whether the referent of the object is the antagonist of the sense
of a dynamic verb.

(It is less reliable as a diagnostic of the force-dynamics of stative verbs. As,
except in certain idioms like Jane loves Peter to death, stative verbs cannot occur in
resultative constructions, the force-dynamic relation between the box and the biscuit
in the box contains the biscuit cannot be identified by using a resultative
construction.)

It is only possible to predicate a resultative xcomp of the object of a verb if
the object of the verb is identified as the patient (i.e. the antagonist) of the verb. There
are some examples in (12).

(12)  a. Jane kicked Peter unconscious

b. Peter helped himself into a wheelchair

c. Jane ran the pavement thin

The examples in (12) show that when a resultative xcomp is predicated of an object
that is required of the verb, as in (12a), the object is the antagonist. Even when the
resultative xcomp’s subject is not a valent of the verb, but it is there just for the sake
of the resultative construction, as a reflexive or as a “fake object”, it’s referent is the
antagonist of the sense of the verb.42

There is a schematic representation in Figure 4.4.

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42 A refined account would say that resultatives that have “false” objects make the object the
antagonist not of the sense of the verb but of the complex predicate formed of the verb and
resultative adjunct. Thus in Jane ran the pavement thin, ‘Jane’ is agonist of ‘run thin’ and
‘the pavement’ is antagonist of ‘run thin’. The significant point is that in a resultative, the
referent of the object is the antagonist of some situation. What is more, you would typically
expect a dynamic transitive verb to be able to occur in a resultative construction.
The structural difference between (12a) and (12c) is that the referent of Peter in (12a) is also the ee of the sense of the verb, whereas in (12c) the referent of the pavement is only the antagonist. The effect of adding the resultative predicate is that the situation is modified, as Levin and Rappaport Hovav (1995) and Carrier and Randall (1992) argue, into a situation where there is a two part structure.

If we take the examples in (13), we can see that the object of LISTEN-class FEEL, SMELL and TASTE is not an antagonist.

(13)  a. !Peter was feeling the fabric unfeelable
      b. !Peter was smelling the coffee odourless
      c. !Peter was tasting the wine flavourless

Although these are dynamic transitive verbs, there is no force-dynamic relationship between their subject and object. The issue is why LISTEN-class verbs are so atypical of dynamic transitive verbs.

There are two possibilities. The first is that there is no semantic relation between the sense of FEEL/A, SMELL/A and TASTE/A and their respective objects. Such a view is patently ridiculous: there is no way that these verbs can have expletive objects. The second possibility, which has supporting evidence in the data in (18), is that the semantic role of the object of LISTEN-class FEEL, SMELL and TASTE is the same as the semantic role of the object of HEAR-class FEEL, SMELL and TASTE. The semantic relation is just that of 'percept', exactly the same as with the HEAR-class verbs. Such an analysis supports an account of the semantic role of the subject of these verbs where it is not in a force-dynamic opposition to its object.
Given that FEEL/A, SMELL/A and TASTE/A do not show a force-dynamic opposition, the conclusion must be that they are force-dynamically the same as LOOK/A and LISTEN. The problem rests in identifying the semantic relation of the object. It appears to have no semantic relation but for that of “Defining Participant” in the terms of Schlesinger (1995: 58-59). This conclusion is not just one that is limited to perception verbs. There are other verbs that are incapable of occurring in a resultative context and which, therefore, do not encode a force-dynamic relation involving their object. For example, *the midwife weighed the baby* is an example which cannot have a resultative xcomp: ‘the baby’ is not the antagonist of ‘weigh’ because it does not encode a force-dynamic opposition.

4.3.5 Defining Participants and the semantic role of the object

Schlesinger (1995) observes that the referents of direct objects appear in a heterogeneous range of semantic relations to the senses of their heads. He suggests that the relevant characterisation of the direct object is that it should be the defining participant in a situation. This is a very general notion. Applied here, it would say no more than that the referent of the direct object of LISTEN-class FEEL, SMELL or TASTE should be perceivable via the appropriate sensory modality. For example, all of the examples in (14) are ridiculous.

(14) a. !Peter was feeling the gossamer fabric that was so soft it was unfeelable
    b. !Peter was smelling odour-free coffee
    c. !Peter was tasting the flavour-free wine

None of the direct objects is a defining participant in the situation. We can account for the requirement that the direct object be perceivable via the sensory modality by re-examining the semantic decomposition of each of these verbs. In 4.2 above, I argued that for each LISTEN-class verb, it was the case that their sense was an instance of an action which involved physical perception but did not entail it. The examples in (2), repeated here, indicated that the verbs encoded a situation of physical perception.
In each of the examples in (2), the context is intended to demonstrate that a feeling, smelling or tasting situation need not entail a perceptual situation. We have seen that the object is a defining participant; it is selected by the verb and it is not possible to have a direct object that does not have a semantic relation to the verb. Furthermore, it has to be perceivable through the appropriate sensory modality. This raises a problem: the referent of the object of a LISTEN-class verb cannot, therefore, be in a direct semantic relation to the sense of the verb. On the other hand, it solves a problem: it allows the ee of the sense of a LISTEN-class verb to be the subordinate situation, making FEEL/A, SMELL/A and TASTE/A have a similar semantic structure to RUN in Figure 4.3.

The ee of the sense of each of the verbs in (2) and (14) is not really the ee of the sense of the verb; it is the ee of the result (or ee) of the sense of the verb. Each of these verbs makes reference to their result in their definitions. A diagrammatic representation of Jane felt the fabric is given in Figure 4.5. The advantage of making the subordinate situation type (c3 in the diagrams) the ee of the sense of the verbs (c2 in the diagrams) is that it ensures that there is a force-dynamic relationship between c1 and c3 which is exactly similar to the force-dynamic analysis of RUN in Figure 4.3 and which is consonant with the agency and dynamicity of these verbs.
There is a diagram for *Jane smelt the coffee* in Figure 4.6.

![Diagram for Jane smelt the coffee](image)

**Figure 4.6**

There is a similar diagram for *Jane tasted the salt* in Figure 4.7.

![Diagram for Jane tasted the salt](image)

**Figure 4.7**

The diagrams in Figures 4.5-4.7 show how the senses of LISTEN-class SMELL, FEEL, and TASTE can be analysed on an account where the sense of the verb is an instance of an action and where the definition of the verb includes the HEAR-class verb's sense. The semantic relation of the direct object can be accounted for by noting that the direct object is not in a direct relation to the sense of the verb; rather it is in a relation to the ee of the sense of the verb. The advantage of calling this relation ee rather than result is that it captures the force-dynamic qualities of the relationship between the two situations, giving rise to the dynamicity of the sense of the verb and the agency of the subject of the verb.

There is a further advantage to this account which reveals an indirect relationship between the sense of the verb and the referent of the object of the verb. I claimed that in the case of HEAR-class verbs, the aktonsart of the verb, or at least the duration of the experience, was conditioned by the nature of perception. One of the factors affecting the nature of perception was the nature of the percept. As the percept
is not in a direct semantic relation to the sense of the verb, we have a natural means of capturing the fact that it does not condition the nature of perception at all in the case of these verbs. It cannot. The absence of a direct relationship makes the percept irrelevant to the perception, except in the matter of selection restrictions.

The sense of LISTEN and LOOK
This section effectively disposes of the analysis of LISTEN-class FEEL, SMELL, and TASTE. I return to the sense of LISTEN and LOOK in the section after next.

4.4 Pinker, Jackendoff, Croft, Talmy, and Dowty

4.4.1 Pinker
As the discussion of RUN in Figure 3 shows, one way to make sense of the issues and the data would be to consider the use of different types of subordinating situation types. Pinker (1989: 197-199) distinguishes between "pure" causation as in the causative/anticausative alternation and other kinds of "causation"; by this account, CUT is a causative verb. Pinker's decomposition of CUT (1989: 199) is rather like Croft's (1991) model of causal chains. It is certainly possible to capture the relationships in the way that Pinker does in a WG semantic representation; ignoring Pinker's unhelpful terminology, we can see that a system of semantic subordination is both compatible with WG and, as in Figures 4.5-4.7, that it can contribute to an analysis of the problems discussed in this chapter.

Pinker's model calls for a wider range of ad hoc semantic relations like result, means, purpose, and so forth than has been present in WG hitherto, but each relation is motivated by an analysis of the senses of a range of verbs. The additional areas of meaning that he invokes are discussed in Talmy (1985a). There is a limited set of relations that can be appealed to. Therefore, having recognised that the situation type 'cause' is not available for ROLL/intransitive and LOOK/A, we can identify a situation type that the senses of these two verbs can be associated with and make an
analysis in terms of situation types. The model of semantic subordination that Pinker advocates is very similar to the account of lexical subordination of Levin and Rapoport (1988). Pinker’s model is a hybrid of the two types of account that I sketched in 4.2.1.1 above. It both classifies situations into situation types and uses specific semantic relations to identify situation types, as actions or events, and it classifies those situation types further as states or events. A finer distinction of situation types is left to the relations that subordinate one situation type to another. However, Pinker does not explain how we would distinguish between pure causatives and intransitive ROLL.

The distinction between pure causatives and situations where one situation has another as an argument was prefigured in the discussion of ‘see1’ in Chapter 3. Pinker therefore identifies the same distinction between causation and other forms of semantic subordination that I have argued for in this thesis.

4.4.2 Jackendoff

Jackendoff, by distinguishing between the action tier and the thematic tier in his (1990) system of semantic structure also avoids the problem of identifying each dynamic situation with an agentive subject. In fact, a very clear pattern emerges over Jackendoff’s system, Pinker’s system and the system being developed here. All three systems treat prototypical causation as semantically complex involving at least one situation subordinated to another and one entity acting on another. I discussed this in 3.3.4.

The problem that remains is how we distinguish between the voluntary and the involuntary variants of intransitive ROLL. My preferred solution is to use the semantic relation volunteer. However, we might see Jackendoff’s distinction between situation types and features on the situation types as a tacit acceptance of a distinction between those semantic differences that are grammatically significant and those that are not. Those conceptual structure predicates that correspond to syntactic distinctions are themselves distinguished, those that only correspond to differences in meaning are limited to feature distinctions.
We could make a similar distinction in WG by keeping a limited set of semantic relations for precisely those ers which were sentient, or which intended the action, or which were opposed to the action. This is possible in WG because semantic relations are primitive to the system; the reason why it is not possible for Jackendoff is that, for him, semantic relations are derived from his ontology of situation types. Perhaps either strategy would work for Pinker because he includes semantic relations as primitives.43

4.4.3 Croft and Talmy

The problem inviting discussion now is the relationship between causation and force-dynamics. In Talmy’s formulation, force-dynamic relationships are relationships between participants in a number of possible situations. These situations include permission giving, as expressed by deontic modality, and hindering, as expressed by the verbs HINDER and PREVENT. Croft (1991:166) following Talmy (1972, 1976) offers an account.

Talmy points out that causation is a relation between events, but he argues that the relevant classification of causation types is based on the status of and change in the entities that participate in the event. The analysis that Talmy uses is based on the ability to speak of one object acting on or entering into a causal relationship with another object and that object being affected by the first object.

Croft claims that the cognitively important relationship holds between the participants, although the actual causal relationship holds between the events. It seems

43 One thing that is rather odd about Pinker’s notation is that semantic relations appear to have the same status as open-argument places in his diagrams. His relations like “effect”, for example, are clearly relational links between one part of the situation and another yet he treats them visually as if they were semantically restricted argument places in a conceptual structure diagram. I find that if you treat Pinker’s predicate types as non-relational categories, and his open and labelled argument places as relations, it is remarkably easy to translate Pinker’s diagrams into WG notation.
to me that the most relevant issue is the question of how the participants turn out to act upon one another. These ideas were discussed in 3.3.4.

According to the Talmy/Croft model, the majority of verbs will involve force-dynamic oppositions. We can see that force-dynamic oppositions are orthogonal to other semantic relations in this model as they are in the other models reviewed in this thesis.

There are verbs which classically involve force-dynamic oppositions, but which are not causative, in that they do not involve the subordination of one sense to another, such as OPPOSE. Equally, there are verbs which involve actions with necessary results, but where it is neither here nor there to claim that one or other of the participants was agonist or antagonist, such as LOOK/A. Croft and Talmy expect such facts on their construal of force-dynamic relations and their account offers further support for the model expounded in this thesis.

4.4.4 Dowty

I have already discussed Dowty (1991) in 1.2.6. Dowty’s (1991) article radically reanalyses the idea of semantic relations. He argues for a conflation of traditional roles such as agent, patient, theme, and instrument into two proto-roles: “Proto-Agent” and “Proto-Patient” which he defines as clusters of entailments, which behave broadly, though not exactly, like prototypical word meanings. The entailments do not compositionally define the notions agent and patient, but rather the presence of one or more of the relevant entailments will give rise to agent or patient effects. The analytical power of the the proto-role hypothesis is achieved by combining the notion of proto-roles with a series of argument selection principles: Dowty argues in favour of a view where semantic roles have semantic content and so are better analysed in terms of argument selection than in terms of argument indexing.

He begins his article by considering the range of role types in common currency and the purposes to which they are put. These accounts of semantic relations were reviewed in 1.2.6. Dowty’s position, that semantic relations have to be considered as a semantic phenomenon, means that he thinks that they are not appropriately used when discussing matters that are best left to syntax, or pragmatics. He proposes a
model-theoretic account of semantic relations by defining event-dependent roles only, according to their logical type, within the domain of argument selection; this approach involves introducing a new role: that of "Incremental Theme".

Dowty's "event-dependent" account is similar to the view of semantic relations defined by situation type that I have been outlining here. Furthermore, his approach is similar to mine in that he takes a prototypist view of relations, permitting some relations to be more prototypical and others to be less so. In addition to keeping distant from the (syntax driven) argument indexing view of semantic relations mentioned before, Dowty also wants to avoid the "preposition-dependent and lexical-structure observations of the Jackendoff-Gruber approach," as well as Jackendoff's later cognitive approach (1991: 561). There is a certain inconsistency of this approach of Dowty's in that at least one of his lexical entailments is localist, and without considering collocational possibilities with prepositions, it is hard to see how it is possible to identify from linguistic evidence that there is a theme element in a particular relation.

One of the motivations for the approach is the observation that there appears to be a regular mapping between semantic relations and syntactic positions. Dowty's proto-roles account, therefore, is in part motivated by linking regularities. However, there is a certain inconsistency between the view of semantic relations as prototypical and relational and syntax as non-prototypical and structured in terms of part-whole relations. The logical type of semantic roles is, from a semantic point of view, "A SET OF ENTAILMENTS OF A GROUP OF PREDICATES WITH RESPECT TO ONE OF THE ARGUMENTS OF EACH" (1991: 552). Because the discussion is of "non-logical" predicates Dowty uses the term "lexical entailment" where the implications about the arguments follow from the meaning of the predicate alone. In addition, he believes that "we may have a hard time pinning down the traditional role types because role types are not discrete categories at all, but rather are cluster concepts like the prototypes of Rosch and her followers" (1991: 571). Within his event analysis he finds only two roles necessary to describe argument selection effectively, proto-agent and proto-patient. The entailments Dowty uses to define them are given here.
Proto-Agent:

a. volitional involvement in the event or state
b. sentience (and/or perception)
c. causing an event or change of state in another participant
d. movement (relative to the position of another participant)
(e. exists independently of the event named by the verb)

Proto-Patient:

a. undergoes a change of state
b. incremental theme
c. causally affected by another participant
d. stationary relative to movement of another participant
(e. does not exist independently of the event, or not at all) (Dowty 1991: 572)

Dowty is uncertain whether the entailments under (e) in each list properly belong in the the proto-role definitions, hence the parentheses. Each of the entailments is assumed to be able to have independent representation, so the proto-roles can be characterised by one or more of the given definitions. Dowty adduces examples to show that each of the entailments can occur alone, justifying their separate inclusion. There is one item that he discusses in his paper before this list is given: that of Incremental Theme. This is a semantic relation that does not appear in other typologies of semantic relations, but which is relevant here on account of how NPs can affect the telicity of predicates depending on whether for example they are bare plurals or mass terms:

(15) a. John drank beer
    b. John drank a glass of beer

The first example has imperfective aspect, the second perfective. Dowty claims that telic predicates are “homomorphisms” where a “homomorphism” preserves
part/whole relations in telic predicates. So in the case of *a glass of beer* the part/whole relationships of the quantity of beer drunk is reflected in the parts of the event of drinking the beer and the part-whole relationships that obtain in that event. However, the point of creating the new role of incremental theme is that such arguments, which indicate the relationship outlined above, are not just found with count or mass terms: *to build a house* has the same homomorphic relationship, as it is also a telic predicate. Therefore, Dowty claims that the new semantic role captures a semantic generalization, not one that could be ascribed to the syntactic matter of number (although definiteness and countability are surely semantic matters) and one that can make the generalization for all telic predicates. Having established the importance of incremental themes, it is for Dowty’s hypothesis an essential part of his account of thematic proto-roles.

Dowty’s approach and his article are highly convincing. In conjunction with the argument selection principle (ASP), which I shall outline below, he uses the system briefly described above to analyse a range of cases of argument linking that have proven problematic to previous accounts of semantic roles. His analyses often work. Dowty’s article, however, does not discuss verbs of perception, so after giving the ASP I shall briefly look at LISTEN-class verbs. The evidence shows that his approach does not work with the verbs studied in this thesis.

**The Argument Selection Principle**

In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalised as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalised as the direct object.

There are two corollaries: in the case of equal numbers of entailed proto-agent and proto-patient then either or both may be lexicalised as the subject; and with a three place predicate the non-subject argument with the most proto-patient properties will be lexicalised as direct object. In addition to the above, Dowty does not claim that proto-roles apply uniquely, exhaustively, or discretely (1991:576).
There is an important initial observation: Dowty's approach for all its eschewing the theoretical foundations of other accounts, draws heavily on localism and force-dynamics. His entailments are glosses over the behaviour of, for example, themes and agonists. We can, therefore, in the light of observations about force-dynamic and thematic relations existing in separate domains, criticise Dowty for conflating force-dynamic and thematic information. We have seen sufficient evidence that these two areas of semantic structure do not always fall out in the same way.

However, there are two major virtues to Dowty's account. The first is that it is relational, at least in terms of semantic structure, and the second is that Dowty shows that it is possible to link directly from relational semantic entities onto syntactic positions (subject to the caveats expressed above). It is possible to take Dowty's article as supporting evidence for the claim that argument structure is not needed in a relational account of linking.

In the case of LISTEN-class verbs, as in an example like Peter listened to the music, all but protoagent criteria (c) and (d) apply to the referent of the subject of the verb, suggesting that a proto-role system can help account for the data. However, given an appropriate example such as the spy-camera looked at me even entailments (a) and (b) are overridden, leaving it unclear how Dowty's model would account for the agency, such as it is, of LISTEN-class verbs with inanimate subjects.

4.5 LOOK/A and AT
In this section, I address the question of what the sense of LOOK/A is. I showed in sections 4.1 and 4.2 that it was an action; the issue is what kind of action. As I have shown that 'look' does not entail any kind of perceptual result, it is relevant here to consider first what other verbs collocate with AT so readily, and secondly to identify what AT might reveal about the theme of 'look'. LOOK/A is similar to verbs of facial orientation. Furthermore, as Gruber (1967) showed, 'look' has a theme. One difference between 'look' and 'see' is that the theme of 'see' is co-extensive with the path of seeing whereas the theme of 'look' is bounded.

I do not discuss the full range of verbs, adduced in Levin (1993) that can occur with AT. The following set is relevant to the analysis of 'look': GAZE, NOD, PEER,
SMILE, SQUINT, STARE, and WAVE. None of these verbs has an object, unless it is a cognate object as in *he smiled a wry smile*. Let us first consider NOD, SMILE and WAVE, which are verbs of gesture; the others are verbs of manner of looking.

Each of these verbs involves communication. In the case of each of them, an act of communication is directed to somebody by non-physical means; we can construe these verbs as involving a kind of direct motion that transmits a message to a recipient. In each case AT can be replaced by TO as in (16).

(16)  
   a. Jane waved to/at Peter  
   b. Jane nodded to/at Peter  
   c. Jane smiled to/at Peter

In this respect, these verbs are different from the verbs of looking which cannot replace AT with TO so easily:

(17)  
   Jane gazed/ peered/ squinted/ stared at the wall/ !to the wall

In the examples in (17), it is clear that TO is problematic with these verbs of manner of looking. The same is true of LOOK/A itself.

(18)  
   Jane looked at the wall/ !to the wall

The reason is that in the examples in (16), to indicates some kind of transfer and in the examples in (17) transfer is inappropriate; looking, however the manner is construed, does not involve transfer. On the other hand, in both cases, the presence of AT indicates a theme: AT describes a path.

The path described by AT requires the theme that travels upon it to be bounded. If we look at the examples in (19), we can see that verbs whose theme is not bounded cannot collocate with AT.

(19)  
   a. *the road goes at Ely
b. the track reaches to /!*at Ely

The counter example is a verb like SPIT.

(20) Jane spat at Peter

However, the theme of spitting can be bounded or not:

(21) a. Jane spat blood
    b. Jane spat a tooth

and we can see that the unbounded theme of spitting cannot occur with AT although the bounded theme can.

(22) a. !Jane spat blood at Peter
    b. Jane spat a tooth at Peter

There is no doubt but that the example in (22b) is better than the example in (22a).

The evidence reviewed here suggests

- that looking is not an action of communicative transfer, unlike smiling
- that looking involves the action of directing a theme

I therefore identify the sense of LOOK/A as being an action that involves only a sub-part of the sense of SEE; that is, the diagram for the sense of LOOK/A is like the diagram in Figure 4.8.
In this diagram, the ee of c1 is "what is gazed", the gaze. It is the gaze that is the er of the moving situation, too. We can see that the sense of LOOK/A involves an er, an ee and a result. In this case the er is an agonist and the ee is an antagonist. The fact that the meaning of LOOK/A does not entail perception is captured by the absence of the ‘image forming’ node of the sense of SEE.

There is an example of how this structure works in Figure 4.9. The sense of ‘look’ is ‘gaze’. However, as ‘look’ has a telic theme, we can see that there are differences between this ‘gaze’ and the ‘gaze’ conflated in the meaning of ‘see’. Specifically, ‘look’ is dynamic. The telicity of the theme of ‘look’ comes about from the result of ‘gazing’ being ‘moving’ rather than ‘reaching’.

Consequences of ‘look’ having a bounded theme

The main consequence of ‘look’ having a bounded theme is that it is one of the facts which makes it possible for ‘look’ to be dynamic. There is, as I have said earlier in this chapter and in Chapter 3, a correlation between boundedness of theme and
dynamicity. Unbounded themes are linked with stative predicates, whereas bounded themes are linked with dynamic predicates. LOOK/A is, therefore, different from other LISTEN-class verbs both syntactically and in its semantics.

The particular feature of ‘look’, like ‘see1’ is that it has a hidden theme. In neither case is the theme a syntactically realised argument of the sense of the verb. However, we can see that even a theme which does not have a syntactic realisation can affect the interpretation of the sense of the verb.

The final point is that the issue as to whether the sense of LOOK/A involved a force-dynamically modified instance of the ‘see1’ or whether it subordinated part of the structure of ‘see1’ has been answered in a surprising way: the sense of LOOK/A is a thematically, and therefore force-dynamically, modified instance of ‘see1’, which does not itself entail that an act of physical perception takes place.

4.6 LISTEN and TO

The final stage is to identify the sense of LISTEN. It became clear in Chapter 1 that the TO after LISTEN is an oblique -- that is, it is a valent of LISTEN and it is obligatory. The TO-phrase, therefore, links to the ee of ‘listen’ in just the same way as the object of FEEL links to the ee of ‘feel’. The issue here is to identify how the sense of LISTEN is constructed. In principle, we can assume that ‘listen’ isa action like all of the other verbs in the class. That is, it has a result whose ee is a defining participant in the sense described above. The er of ‘listen’ behaves exactly like the other ers of the verbs in this class.

I have shown that the perceiving situation ee of the senses of FEEL/A, SMELL/A and TASTE/A is obligatory, and that of LOOK/A is always absent. LISTEN is different again. ‘Hearing’ is potentially a part of ‘listen’ as the examples in (23) show.

(23) a. Jane listened to Peter without hearing a word he said.

b. Jane listened intently and heard all of the bad advice she was given
The examples suggest that the structure of ‘listen’ is as I have shown in Figure 4.10. The brackets show that the relation is an optional one.

![Diagram](image)

**Figure 4.10**

The diagram states that as in the case of the other words in this class, the sense of LISTEN is an action and that this action has a result, which is optional here. The ee of the sense of LISTEN is not the ee of ‘listen’ but the ee of the result of ‘listen’, hence the absence of a direct semantic relation between the sense of LISTEN and its complement.
Chapter 5
The semantics of SOUND-class verbs.

5.1 Introduction
There are three possible uses of these verbs. The uses are distinguished by the semantic relations that they involve and by the entities that are related. Each use, therefore, conforms to a different sense. The first use is an evidential one where the referent of the subject has properties that provide the evidence for the evaluation as in (1).

(1) a. he sounds foreign
    b. he looks ill
    c. the fabric feels old
    d. the wine smells delicious
    e. the food tastes fantastic

We shall call this the “evidential-1” use. The patterning of syntactic and semantic relations is similar to examples like Jane tried to go.

The second use is also an evidential one, but the referent of the subject is not the source of the evidence for the proposition that the xcomp expresses. This is the “evidential-2” use. In these examples, the pattern of syntactic and semantic relations is like that in Jane seemed happy. There are examples in (2).

(2) a. I’ve heard the forecast and tomorrow’s weather sounds fine
    b. I’ve seen the forecast and tomorrow’s weather looks fine

The final use is an “attributary” one as in (3).

(3) a. this music sounds lovely
    b. Peter’s face looks lived in
    c. this cloth feels sticky
    d. this food smells spicy
e. this food tastes rancid

In the attributary use, the semantic relations form a “complex predicate”, a notion which is explained in 5.2.6 below. Whereas the evidential uses all mean something like “seem, with respect to a particular sensory modality”, the attributary uses mean “is, with respect to a particular sensory modality”. It is impossible to follow the examples in (3) with a phrase like “but it isn’t really”. Syntactically, all of the uses are “sharing” patterns where the post-verbal element is an xcomp and the subject of the SOUND-class verb is also the subject of the xcomp, so there is no syntactic difference between the three semantic classes.

The three usages of these verbs can be identified by paraphrases and by other criteria. If we take the examples in (1), it is clear that in (1a), the referent of he is the sound-er and his sound is evidence for his being foreign. In (1b) the referent of he is the look-er and his appearance is the evidence for his being ill. The same analysis holds for all of the sensory modalities.

The examples in (1) could be paraphrased by those in (4).

(4)  

a. to judge by his sound, he is foreign  
b. to judge by his look/ appearance, he is ill  
c. to judge by its feel, the fabric is old  
d. to judge by its smell, the wine is delicious  
e. to judge by its taste, the food is fantastic44

In the paraphrases in (4), the to judge by phrase shows that these uses encode a speaker judgement. The relationship between his and he in (4a-b) and its and its anaphoric head in (4c-e) show that it is the sound, look, feel, taste or smell of the subject that provides the evidence for the assertion.

44 It might be argued that if food tastes fantastic, it is fantastic, and so the phrase to judge by here is inappropriate. This argument cannot be true. A number of elements come into the evaluation of food as fantastic or otherwise: taste, texture, appearance and smell at least. An utterance like this food tastes fantastic, but in all other respects it is revolting is fine.
The examples in (2), repeated below, have a different analysis.

(2)  
   a. I've heard the forecast and tomorrow's weather sounds fine  
   b. I've seen the forecast and tomorrow's weather looks fine

In these cases, the referent of the subject is not the source of the evidence for the proposition expressed by the xcomp. Instead, the sensory modality expressed by the verb identifies the means by which the speaker comes to have the information which leads to the judgement. These examples can be paraphrased as in (5).

(5)  
   a. to judge by what I've heard, tomorrow's weather will be fine  
   b. to judge by what I've seen, tomorrow's weather will be fine

Again, the to judge by phrase shows that this use encodes a speaker judgement. The difference between these examples and those in (1) is that the referent of the subject of the examples in (2) is not the source of the evidence for the proposition expressed by the xcomp.

It is hard to find unequivocal examples of SOUND-class FEEL, SMELL and TASTE that pattern like the examples in (2). However, extraposed subjects of verbs that have xcomps are often taken to be good evidence of this kind of structure as the examples with SEEM, LOOK and SOUND shown in (6).

(6)  
   a. it seems unlikely that she will ever visit now  
   b. it looks unlikely that she will ever visit now  
   c. it sounds unlikely that she will ever visit now

We can see that the examples in (7) with FEEL, SMELL and TASTE fit the bill.

(7)  
   a. it feels improbable that he will be found guilty  
   b. it smells lovely to roast onions with cumin
c. it tastes lovely to melt chocolate on your tongue

I take it, therefore, that FEEL, SMELL, and TASTE have evidential-2 meanings as well as SOUND and LOOK.

The attributary use of (3) has a rather different semantic structure from the examples in (1) and (2). I have repeated (3) here.

(3) a. this music sounds lovely
   b. Peter's face looks lived-in
   c. this cloth feels sticky
   d. this food smells spicy
   e. this food tastes rancid

In the examples in (3), the er of the sense of the xcomp is the sense of the verb and not the referent of the subject. That is, in (3a) it is the sound of the music that is lovely, not some other quality. It would be reasonable to say (3a) when the referent of this music was the score and not the sound of the music. In these cases, the semantic structure is just the same as the semantic structure in the book weighs a kilo. In this example, it is the weight that is a kilo and not the book. In the same way, Peter looks lovely is not an assessment of Peter's inherent qualities, or his character, or some other lovely aspect of Peter. It is a description of his appearance. The attributary uses of these verbs are more like the evidential-1 uses than the evidential-2 ones in that the referent of the subject of the verb is an argument of the sense of the verb. However, the attributary senses differ from both the raising and the control examples in that the subject of the verb is not directly semantically related to the xcomp. Furthermore, the attributary uses cannot be paraphrased by a to judge... string as the examples in (8) show.

(8) a. !to judge by its look, Peter's face is lived in
   b. !to judge by its sound, this music is lovely
   c. !to judge by its feel, this cloth is sticky
Attributary examples can be paraphrased by the examples in (9).

(9)  
a. Peter’s face has a lived in look  
b. the cello has a lovely sound  
c. the cloth has a sticky feel

The examples in (8) show that attributary uses do not encode a speaker judgement. The examples in (9) show that the verb and its xcomp form a semantic unit where the sense of the xcomp modifies the sense of the verb. The referent of the subject is then the er of the whole semantic unit. I have called these patterns attributary because semantically they resemble the attributive adjective + noun patterns in (9).

The three possible uses correspond to the different patterns by which the concepts involved can be connected by semantic relations. They therefore correspond to different senses, or subsenses of each of the verbs. In support of the claim that they correspond to different senses, there are factivity differences between the evidential uses and the attributary use. The evidential uses of SOUND-class verbs are non-factive, as is shown by (10) and (11).

(10)  
a. he sounds foreign but he isn’t  
   aa. he sounds foreign and he is  
   b. he looks ill but he’s as fit as a flea  
   bb. he looks ill and he is

(11)  
a. he sounds a nice man but he isn’t  
   aa. he sounds a nice man and he is  
   b. he looks a nice man but he isn’t  
   bb. he looks a nice man and he is

The attributary use, on the other hand, asserts the truth of the proposition. If I show you some sheet-music and utter (12), I am making a nonsensical assertion.
As the referent of the subject is not a semantic relation of the sense of the xcomp in these examples, I am uncertain whether they can properly be called "factive" in that there is (arguably) no subordinate proposition. The examples in (13) show that factivity judgements about the attributary use hold for all of the sensory modalities.

(13) a. !this paper looks pink but it's blue  
b. !this music sounds lovely but it's horrible  
c. !the cloth feels wet but it's dry  
d. !this food smells spicy but it's bland  
e. !this food tastes rancid but it's fresh

In fact, these data are further evidence that attributaries do not involve a subordinate proposition. The judgements in (13) are the same as those for examples like *Peter ran quickly but he was slow.*

We can, therefore, identify three separate senses of SOUND-class perception verbs. The attributary/evidential distinction can be decided according to factivity. The evidential-1/evidential-2 distinction is made on the basis of whether there is a semantic relation between the sense of the verb and the referent of its subject or not.

There is a tendency, which comes out clearly when you examine the categories of the xcomps of these verbs and the senses that they are associated with, for evidential-2 examples to be associated with the more distal sensory modalities, hearing and sight, and attributary examples to be associated most closely with smelling and tasting. For example, it is only LOOK, and SOUND, as in (2) above, that can have an evidential-2 sense when they have a noun as their xcomp. Furthermore, only SMELL and TASTE can have OF as their xcomp. The only semantic structure possible with OF is the attributary one; this point is made in greater detail below.
Given the analogies to TRY and SEEM when I introduced the evidential senses of SOUND-class verbs, it might appear that the difference between evidential-1 and evidential-2 is the difference between raising and control. As I explained in Chapter 1 and Chapter 2, WG handles the difference between control and raising in the semantics. It is not a syntactic difference. However, for three reasons, I do not want to make the claim that there is such a simple distinction in the case of SOUND-class verbs.

The first reason is that the syntactic distinction between raising and control common in the literature leaves the impression that the boundaries are clearly distinguishable. We shall see that in the case of SOUND-class verbs there are examples where it is very hard to establish whether a given construction involves raising or control. The second reason is that, as we shall see, the semantic structure of SOUND-class verbs is richer than that of SEEM. Given that our distinction between raising and control is semantic, this is a good reason for not identifying the evidential-1 use of SOUND-class verbs with raising as exemplified by SEEM. The third reason is that the analysis below presents a finer grained analysis of the evidential meanings of SOUND-class verbs than I have sketched here. The division into raising and control is too crude.

If we take an example like (14), it is clear that there is at least one other issue that has to be investigated.

(14) he sounds a nice chap

The semantic relation between ‘a nice chap’ and the referent of he is not er. It is isa. (14) means that ‘he’ is an instance of the category ‘a nice chap’ subject to the proviso that this is a category assignment based on information the speaker has heard. Isa is the semantic relation of category assignment and it is the relation that you find between the meaning of a number of xcomps and their subjects. It is the relation that you find with all nominal xcomps, for example, irrespective of whether their head is a SOUND-class verb, BE or SEEM. For reasons detailed below, the isa relation is
incompatible with theattributary sense of these verbs, giving a reason for the
restriction on nominal xcomps and attributary senses.

In the next section, I present and discuss a diagrammatic representation of the
evidential senses and the attributary sense of SOUND. In subsequent sections, having
discussed the semantic entry of the verbs, I shall examine the semantics of specific
complementation patterns and some issues in the history of SOUND-class verbs.

Before presenting my account, I should first mention Rogers’ (1971, 1972,
1973, 1974) work. Rogers presented an analysis of SOUND-class verbs which dealt
with some of the issues that I am concerned with here. He was concerned with how
these verbs are related to HEAR-class and LISTEN-class verbs; with the issue of
whether there was a semantic relation between the referent of the subject and the sense
of the verb or not; with whether the subject of these verbs was an underlying object;
with how many senses these verbs had. He was also acutely concerned with an issue
that I devote a large section to: the status of LIKE as a dependent of these verbs when
it is a subordinating conjunction, rather than a preposition.

However, I do not draw on Rogers’ work. Our concerns are different in that
his theory and WG are opposed on a number of issues; most obviously, Generative
Semantics is polystratal and anti-lexicalist whereas WG is monostratal and radically
lexicalist. I do not, therefore, think that an extended theory comparison would be of
much use. Not only is Generative Semantics no longer practised but also, because the
differences between them are so extensive, the two models do not lend themselves to
comparison. Consequently, it is hard to see what useful observations could be drawn.
Rogers’ work has brought some data to my attention, but otherwise there are no
points of contact between his work and this study.

5.2 The semantic entries for SOUND
This chapter presents a view of these verbs in which the semantics of the evidential-1
meaning is like the diagram in Figure 5.1 the evidential-2 meaning looks like the
diagram in Figure 5.2, and the attributary meaning looks like the diagram in Figure
5.3. Figures 5.1-5.3 present a complete account of their respective meanings. The
rest of the chapter is a discussion of the account in Figures 5.1-5.3. It justifies the
Having discussed the semantic entry of the verbs, I examine the semantics of specific complementation patterns and certain issues in the history of SOUND-class verbs in later sections of this chapter. In the diagrams, "exp" stands for experiencer. I refine the analysis below.

Figure 5.1

Figure 5.1 accounts for the sense of SOUND in examples like *he sounds foreign.*
Figure 5.2

Figure 5.2 accounts for the sense of SOUND in examples like *I've heard the forecast and tomorrow's weather sounds fine.*

Figure 5.3

Figure 5.3 accounts for the sense of SOUND in examples like this *music sounds lovely* as in (3a).

The diagrams in Figures 5.1-5.3 are very full and rather complicated. Therefore, I discuss them part by part. First, I discuss the evidential meanings of SOUND-class verbs looking at the issue of how they encode a kind of belief. This involves considering the relationship between these verbs and the meaning of SEEM. I then look at how evidential SOUND-class verbs encode a kind of subjectivity and then finally I examine the relationship between evidential SOUND-class verbs and
attributary SOUND-class verbs. The force-dynamics of SOUND-class verbs is discussed in relation to the modal meaning and the aktionsart of SOUND-class verbs.

5.2.1 Evidential SOUND-class verbs

Figure 5.1 and 5.2 makes the claim that the evidential senses of SOUND-class verbs express a kind of epistemic modality. The specific claim is that the sense of SOUND is an instance of believing. (15) presents some evidence that the meaning of SOUND encodes a belief.

(15) a. why is John tired (*to you)?
   --because he stayed up late
   --because he’s yawning
b. why does John sound tired to you?
   --because he stayed up late
   --because he’s yawning
c. John sounds tired, but I don’t know whether he really is
d. * John is tired, but I don’t know whether he really is

The examples in (15) show that the question why is John tired? needs an answer that gives a reason for John’s tiredness whereas the question why does John sound tired? requires an answer that refers to the evidence for John’s tiredness. The question in (15b), therefore, is investigating a belief rather than a fact. The evidence in (15c-d) shows that the truth of the subordinate clause in John sounds tired can be questioned, whereas John is tired asserts the truth of the proposition that John is tired. A further piece of evidence that these verbs encode a belief is that they are non-factive. This means that the speaker neither asserts that the subordinate proposition is true nor asserts that it is false.

Finally, there is a requirement for the xcomps of these verbs to be gradable. As we shall see in section 5.2.2, this shows that a judgement is being made by the experiencer. In the case of nominal xcomps, the experiencer is making a degree of membership prototypicality judgement. Furthermore, as Lyons (1977: 797) points
out, "[a]ny utterance in which the speaker explicitly qualifies his commitment to the truth of the proposition expressed by the sentence he utters...is an epistemically modal, or modalized utterance." The requirement for the xcomps of these verbs to be gradable is a requirement for the proposition that the xcomps express to be qualified.

Figure 5.4 presents the relevant section of the diagram in Figure 5.2. As both evidential-1 and evidential-2 share their modality, the difference between them being whether there is a semantic relation between the sense of the verb and the referent of its subject, there is no need to discuss the differences between the two evidential senses here.

The diagram in Figure 5.4 claims that 'sounding' is a result of 'hearing'; and that this is inherited by virtue of the fact that 'sounding' is inherited from 'seeming' which is the result of an experience. The modality of 'sounding' is inherited from 'believing': the ee of 'sounding' is a proposition just as the ee of believing is a proposition. C3 inherits its ontological classification from c2. The difference between 'seeming' and 'believing' is that 'seeming' does not have an er; the difference between 'sounding' and 'believing' is that in 'sounding' the proposition is brought into the experiencer's consciousness through their hearing something.
There are two issues the diagram raises at this point. The first concerns the relationship of ‘seeming’ to ‘sounding’ and ‘believing’; the second is the fact that it is at this point that we see the differences between the different kinds of epistemic SOUND. The two issues are obviously related.

Default inheritance makes it possible for ‘seeming’ to be an instance of ‘believing’ even though it does not enter into relations in the same way as ‘believing’ and even though the linking of the arguments of ‘seeming’ to syntax is very different from that of ‘believing’.

What makes ‘seeming’ more specific than ‘believing’ is that it is a kind of belief that is the result of experience. Like ‘believing’, there are two participants in ‘seeming’, the experiencer and the proposition, but in ‘seeming’ these are relabelled so that the experiencer is not the er of ‘seeming’. This analysis of ‘seeming’ is unique in that it defines a verb’s meaning as a result. In all other cases of verbs which have a complex semantic structure including two situations, the verb’s meaning is defined in terms of having a result rather than being one. So, for example, in causative OPEN, the sense of OPEN is a ‘cause’; and in the case of KILL, the sense of the verb also is a ‘cause’. In both cases, the meaning of verb is defined by the nature of the result of ‘cause’. On the other hand, with HEAR-class SOUND, the verb is a ‘seeming’ and the nature of the verb is defined by the kind of causing situation.

Evidential-2 ‘sounding’ inherits all of the properties of ‘seeming’. It has a similar sense, made more specific as a consequence of being the result of a particular kind of sensory experience, ‘hearing’. It has the same number of semantic relations as ‘seeming’. The semantic relations are mapped between concepts in the same way as they are in the case of ‘seeming’. We can see this in the structure diagram in Figure 5.5, which captures the semantic structure of ‘sounding’ in an example like tomorrow’s weather sounds problematic to me. This diagram is an instantiation of the structure presented in Figure 5.2. (Evidential-2 ‘sounding’).
The particular way in which 'sounding' is more specific than 'seeming' according to this diagram is in the evidence for the proposition being the ee of 'hearing'. Otherwise, the semantic structure of 'sounding' is like that of 'seeming'. However, the structure in Figure 5.5 shows one of the reasons why I did not want to call this sense of SOUND a raising sense. Although the semantic structure is very similar to 'seeming' and although the subject is not in a semantic relation to 'seeming' it is still important that there is information which has become available to the experiencer precisely through the auditory channel. There is a relationship between what is heard and the proposition: what is heard gives the evidence for the proposition. The problem that Figure 5.5 presents is whether the referent of the xcomp should be the er or the ee of 'sounding'. This decision is perhaps arbitrary, but I have decided that, given the prototypical nature of semantic relations, it should be the ee, as it is ees that link concepts like 'believing' to propositions.

The other evidential sense of SOUND is also an instance of 'seeming', although once again, it has a slightly more complicated structure than 'seeming'. The major difference between evidential-1 'sounding', presented in Figure 5.6 and evidential-2 'sounding' is that evidential-1 'sounding' has an er relation as well as its ee relation, which identifies the source of the experience giving rise to the instance of 'seeming'. There is consequently a different configuration of relations and concepts.
The fact that the referent of Jane is what is heard is what makes 'Jane' the source of evidence for the proposition. I am uncertain whether 'Jane' should, at the same time, be identified as the er of 'sounding'. On the one hand, making 'Jane' the er of 'sounding' is very peculiar if 'sounds' inherits from 'seeming'; on the other hand, it is Jane’s sound that is the source for the proposition. Perhaps the fact that 'Jane' is the ee of 'hearing' differentiates this sense sufficiently from the evidential-2 sense making the er link entirely unnecessary. In the diagrams below, I shall include this er link to demonstrate that it is the referent of the subject’s sound that is the evidence for the proposition, and to obviate the need to draw all of the semantic structure including the 'hearing' information. To the extent that the evidential-1 sense may include this link, it does so as a gloss over the fact that the referent of the subject is the ee of 'hearing'.

The diagram in Figure 5.6 presents another reason for my hesitating over calling the different evidential senses of SOUND raising or control. In this case, we have the control sense of the verb and, in order for its relation to 'believing' to be right, it is an instance of 'seeming'. In principle this is perfectly acceptable, given the way in which defaults are overridden. But it is hard to see how sounds in Figure 5.6 could be a control example without a direct semantic relation from 'sounds' to 'Jane'. If there were such a semantic relation, it is hard to see how it could be an instance of 'seeming'. My hesitation about whether there is an er of 'sounding', therefore, is part of my reason for hesitating over whether control and raising are appropriate terms.
Examples like *Jane sounds nice* raise the most important point of all. Often it will not be possible to identify which sense of *SOUND* is present. A number of examples are indeterminate. The competing analyses have to be similar enough to capture the fact that any one of the three structures in Figures 5.1-5.3 may be the appropriate one.

My claim in this section is that the relation of the evidential senses of *SOUND* to ‘believing’ means that they capture a kind of epistemic modality. In all cases, the sense of *SOUND* is an instance of ‘seeming’. This means that a simple distinction into raising and control senses is inadequate because it does not capture the fact that a control sense can be a more specific instance of a raising one. In the next section, I look at how the gradability of the xcomp of a *SOUND*-class verb is further evidence for an analysis of these verbs as epistemically modal.

### 5.2.2 Gradability as evidence for epistemic modality

The requirement that the xcomp of the control and raising senses of *SOUND* and the other *SOUND*-class verbs has to be gradable is evidence that these verbs are epistemically modal. Many adjective and LIKE xcomps are automatically gradable. The requirement that the xcomp of a *SOUND*-class verb has to be gradable is thrown into relief by the behaviour of their noun xcomps. A noun xcomp has to be modified by an adjective if it is to appear as the xcomp of a *SOUND*-class verb. There are some examples in (16). If the noun is not modified by an adjective, or if it is not in some other way made gradable, it is unacceptable as the xcomp of a *SOUND*-class verb.

(16)  
- a. Peter sounds a nice man  
- b. !Peter sounds a man  
- c. Peter looks a nice man  
- d. !Peter looks a man

The crucial fact is that assignment to a category such as ‘man’ does not involve evaluation whereas classification as ‘a nice man’ does. All of the xcomps of raising and control *SOUND*-class verbs have to be gradable; this fact shows that the sense of
the verb involves an element of speaker judgement about the status of the referent of the xcomp.

In (16) I have not included examples of FEEL/P, SMELL/P and TASTE/P with nominal xcomps. This is not because I think that these verbs cannot occur with nominal xcomps but because interference from transitive uses of these verbs means that clear examples are hard to get.

The reason why the cases where there is an isa relation between the sense of the xcomp and the referent of the subject clarify the issue of whether SOUND-class verbs are epistemic or not is that the category which the nominal xcomp defines must always have degree of membership prototypicality properties. It is not sufficient for them to have degree of typicality properties. To this extent, SOUND-class verbs are different from BE.

BE can also have a nominal xcomp and, when it does, the semantic relation between the sense of the xcomp and the referent of the subject is also isa. However, the referent of the nominal xcomp of BE is not required to be gradable.

(17) a. Jane is a teacher
    b. Jane is a nice person

(17a-b) both involve category assignment. In addition, (17b) states that there is an evaluation of the referent of the xcomp. (17a) is not evaluative, it simply assigns the referent of Jane to a class. In (17b), the category that ‘Jane’ is being assigned to is not a clearly delimited category with obvious criteria for inclusion. It is an ad hoc category whose membership is determined by the person making the category assignment. The point that emerges is that the issue of whether an instance of BE is evaluative or not hinges on whether the xcomp of the instance of BE is gradable or not. With a SOUND-class verb, the xcomp of the instance of the SOUND-class verb has to be gradable, so the category assignment has to be evaluable. As far as SOUND-class verbs are concerned, whether or not an assignment is evaluable is contingent on whether degree of membership judgements are possible for the relevant
category. An xcomp which is gradable is one that permits degree of membership evaluations.

Taylor (1989) points out that there are two kinds of prototypicality judgement. The first is when categorisation involves making degree of membership judgements. ‘Fool’ is a category which is subject to degree of membership prototypicality. You can be a right fool, or a bit of a fool. It is possible to be a member of the category ‘fool’ only in part. The second is when there are also goodness and badness of exemplar ratings. For example, a penguin is 100% bird, but it is a poor example of a bird because it does not have all of the typical properties of a bird. Even so, an example like the penguin looks a bird is semantically anomalous because ‘look’ is sensitive to degree of membership prototypicality, not degree of typicality prototypicality.

As far as SOUND-class verbs are concerned, degree of membership prototypicality is signalled by the property of being grammatically gradable. The meaning of LOOK/P exploits the fact that some categories are subject to degree of membership prototypicality, so that when the referent of the subject of an instance of LOOK/P isa the sense of some xcomp of an instance of LOOK/P the isa relation is subject to an evaluative, or epistemically modal, judgement. We can see that the difference between BE and LOOK/P is that LOOK/P involves making an evaluation. BE is only evaluative when it has a gradable xcomp. LOOK/P requires a gradable xcomp, therefore it is always evaluative.

The nature of perception is such that there may be cases where we make category assignments according to one of our physical senses and the sensory perception leaves no room for doubt. The relevant sensory modality is the main means by which we can make the category assignment. For example, I can only decide that an entity belongs to the class of physical objects I call paintings on the basis of visual evidence. I can only decide that an entity is salt, rather than sugar, on the basis of gustatory evidence. Presented with two odours, I can only decide that one is perfume and the other antiseptic on the basis of olfactory evidence. These cases are particularly rare, however. I may want to make a categorisation on the basis of the evidence of one of my senses, but typically that evidence might well be quite
insufficient. Looking at somebody, listening to them, or listening to you talking about them, might be actions that provide me with some information about whether I can fairly assign them to the category *a nice person*, but that information can only ever be partially adequate.

I take it that the requirement that SOUND-class perception verbs are always evaluative (rather than being clear-cut in terms of category assignment) is due to the unreliability of sensory data. We might assume that our senses provide us with reliable information but the analysis of this data suggests that, linguistically, we encode the unreliability of our directly embodied experience. Or, perhaps more accurately, we encode the unreliability of how information presents itself.

The senses of SOUND-class verbs are always evaluative and so they require any isa relation between the referent of the subject and the sense of the xcomp to link the referent of the subject to a category that allows degree of membership judgements. This is the reason why nominal xcomps of SOUND-class verbs often have to be modified by an adjective. The sense of the noun constitutes a category to which the referent of the subject is assigned. If the category is not one that permits degree of membership assessments, it has to be turned into such a category by the addition of an adjective. If, on the other hand, the category referred to by the noun is a category which does permit degree of membership assessments, that noun can be the xcomp of a SOUND-class verb without adjectival modification. There is an example in (18).

(18)  a. Jane looks a fool
       b. Peter sounds a fool

Both of the examples in (18) are acceptable because the category referred to by *fool* is not an absolute category. Degree of membership judgements are possible, as examples like *a right fool* and *a real fool* show.

The fact that the xcomp has to be gradable shows that there are no possible candidates for a non-evaluative meaning of LOOK/P. If we try to find such possible candidates, we need to consider cases where the referent of the subject of LOOK/P could be properly assigned to a category on the basis of visual information only. If
examples like those in (19) were possible, we would have a case where it was possible to have an instance of LOOK/P in which the referent of the subject isa the sense of the xcomp but the sense of LOOK/P did not evaluate the possible accuracy of the category assignment.

(19)  a. !vermilion looks a red

  b. !this object looks a painting

I have given the xcomp of looks in (19a) as a red because the isa relation only applies in cases where the xcomp is a physical thing. When colour expressions are adjectives, as they must be when they occur predicatively with no article, the semantic relation between, for example, the sense of RED/adjective and the referent of its subject is er rather than isa. The fact that looks in both (19a) and (19b) could be replaced by is shows that the categorisation is not a problem. However, the certainty of the categorisation is at odds with the evaluative element of the meaning of LOOK/P, hence the exclamation mark.

The conclusion is, therefore, that all non-attributary instances of SOUND-class verbs are epistemic and that this fact accounts for the limits on the possible xcomps of these verbs.

The isa relation only applies to the senses of nominal xcomps of SOUND-class verbs. We have seen that the reason why such xcomps have to be gradable in some way is due to the fact that all instances of SOUND-class verbs are evaluative. If they were not all evaluative, as the sense of BE is not always evaluative, it would be possible for there to be an isa relation between the sense of the xcomp and the referent of the subject in all cases.

5.2.3 The TO-phrase data

In this section, I am looking at the relationship between the experiencer and the sense of SOUND. I take it that the TO-phrase data is evidence of subjectivity and that a

\[\text{\[\text{\cite{45}}\\] I take it that evaluation is a sub-domain of epistemic modality. In examples like John left hours ago, he must be in London by now the epistemic modality of must encodes an evaluation about the likelihood of John's being in London.}\]
subjective interpretation of these verbs is further evidence that they are epistemically modal. By default, when there is no expressed experiencer phrase, the experiencer is assumed to be the speaker. Therefore, in (20) and (21) the TO-phrase is entirely natural and if there were no TO-phrase we would assume that the evaluation was being made by the speaker.

(20)  a. he sounds foreign to me  
      b. he looks ill to me  
      c. the book feels old to me  
      d. the wine smells delicious to me  
      e. the food tastes fantastic to me

(21)  a. it sounds improbable to me that he will be found guilty  
      b. it looks improbable to me that he will be found guilty  
      c. it feels improbable to me that he will be founds guilty  
      d. it smells wonderful to me to roast onions with cumin  
      e. it tastes wonderful to me to melt chocolate on my tongue

Semantically, the experiencer is an argument of the verb. The semantic relation between the sense of the verb and the referent of the TO-phrase is dictated by the sense of the verb, not the TO-phrase. In Figures 5.1-5.6, I labelled the referent of the to-phrase “experiencer” as a pretheoretical device in order not to prejudice discussion.

There are two issues. The first concerns the exact nature of the semantic relation between the experiencer and ‘sounding’. The second concerns how the experiencer is related to subjectivity.

I take it as uncontroversial that a subjective interpretation of SOUND-class verbs supports their analysis as epistemically modal. Apart from the discussion of the example in (22), in Perkins (1983: 68), following a discussion in Lyons (1977: 805), which, Perkins claims, expresses objective epistemic modality, most authors on modality, such as Palmer (1986: 53), agree that epistemic modality is typically
subjective. There is a direct correlation between speaker evaluation and the possibility that epistemic modality expresses.

(22) If it is possible that it will rain, you should take your umbrella

The fact that the epistemically modal expression in (22) can be embedded under IF is what makes this an objective epistemic modality for Perkins. Perhaps it is safest to claim that while epistemic modality need not be subjective, an expression that expresses a subjective evaluation is necessarily epistemic. Perkins (1983) does not discuss SOUND-class verbs at all in his, otherwise, very full account of modality.

My claim is that the raising and control senses of SOUND-class verbs locate the epistemic evaluation in the mind of an experiencer. This analysis is similar to Dixon’s (1991: 200) observation that these verbs involve an arbiter. By default, that experiencer is the speaker. Otherwise, the experiencer is referred to in the TO-phrase.

Let us first examine the semantic relation between the referent of the TO-phrase and ‘sounding’ in the diagram in Figure 5.7 below which analyses the structure in *he sounds foreign (to me).*

![Diagram](image)

*Figure 5.7*

It is in analysing the semantics of TO-phrase experiencers that the account of semantic relations as prototype clusters in Chapter 3 becomes useful. The issue that needs to be discussed is whether it is necessary to add the semantic relation ‘experiencer’ to the inventory of semantic relations or whether we can use the relations that we have by
separating agonist and antagonist out from the er and ee prototypes. Figure 5.7 presents *he sounds foreign to me* using the semantic relation experiencer. Figure 5.8 shows how it is possible not to use experiencer as a relation if agonist and antagonist can be assigned separately from the er and ee prototypes. In this diagram “ago” is the label used for the agonist semantic relation, and “ant” is the label used for the antagonist semantic relation.

Figure 5.8

There is no need to add experiencer to the inventory of semantic relations. Given the prototypical nature of semantic relations, we can unpack the er and ee prototypes so the force-dynamic relations do not have to be aligned with the er and the ee as I argued in Chapter 2. In fact, if in evidential-1 cases the referent of the subject is the er of ‘sounding’, the diagram in Figure 5.7 forces us to make this choice because if the er and the ee were agonist and antagonist respectively we would expect ‘sounding’ to be dynamic rather than stative. What is more, we would have no way of capturing the epistemic nature of ‘sounding’. Identifying the experiencer as a force-dynamic participant in ‘sounding’ helps capture the modality of sounding. Finally, experiencer is not a uniform semantic relation; it frequently does not appear in inventories of semantic relations, as the discussion of experiencers in Chapter I shows, and so we can conclude that it is best avoided as a semantic relation type.

The issue relates to the structures of ‘believing’ and ‘sounding’. As ‘sounding’ does not inherit the linking patterns of ‘believing’ and as it overrides the defaults of ‘believing’, there needs to be a way of capturing the relationship between
the experiencer and the proposition. Given Sweetser’s (1990) account of modality, there is an advantage in identifying the similarities between SOUND-class verbs and other instances of modal meaning. Sweetser (1990) notes that there is a force-dynamic relationship between the utterer of an epistemically modal verb and the proposition encoded by the xcomp of the modal which, she shows, resembles the one found in deontic modality.

Deontic modality is clearly force-dynamic. *You must go* involves a force-dynamic relation between the imposer of the obligation and the subject of the verb in that the utterer of a deontic modal is an agonist and the addressee is the antagonist. The situation is slightly different when the subject of a deontic modal is not the addressee. In *all students must pass seven exams*, the force-dynamic relation between the utterer and the subject of the verb is an indirect one.

Epistemic modality does not involve the imposition of an obligation. However, a force-dynamic relation still exists. In this case, the proposition expressed by the xcomp of a modal verb and its subject imposes itself on the consciousness of the utterer of the modal. In *they must be there by now*, the proposition is the agonist imposing on the consciousness of the utterer. Epistemic modality, in addition to involving a different semantic field from deontic modality, involves a reconfiguration of the force-dynamic relations.

The claim made in Figure 5.8, then, is that ‘sounding’ is epistemically modal; its epistemic modality is captured not just by its being a (non-prototypical) instance of ‘believing’ but also by its force-dynamic character. Furthermore, the analysis in Figure 5.8 captures the fact that it is entirely customary with these verbs for the utterer to be an argument of the sense of the verb, as it is with epistemic modals, and that the semantic relation is the same as with epistemic modals. It is wrong to class the utterer of an epistemic modal as an experiencer. There is nothing we could claim the utterer of *they must be there by now* might experience. The only reason we might have for calling the “experiencer” of a SOUND-class verb the experiencer is that they experience the sensory perception that gives rise to the evaluation. But in the case of evidential-2 SOUND-class verbs, there is no sensory perception so there are no grounds for identifying this as an experiencer argument.
I demonstrate below that the force-dynamic status of the experiencer is a critical issue in looking at the history of these verbs, which I do in section 5.4. I also show, in a related discussion, that the force-dynamics of these verbs is crucial to an understanding of their aktionsarts.

5.2.3.1 Subjectivity
I have shown that the utterer of a SOUND-class verb is an argument of the sense of the verb. As in the case of modals, this fact shows that SOUND-class verbs are subjective. Subjectivity is a species of deixis and so involves the utterance and the locutionary act. It is, however, not a term that is clearly defined in the literature. Cognitive Grammar (Langacker 1987: 128; 1990) takes a very different view of subjectivity from the literature on grammaticalisation (Traugott 1982, 1989; Wright 1995). As both Figures 5.7 and 5.8 show, when there is no experiencer grammatically present, the speaker is deictically involved in the situation by virtue of being the antagonist.

In Traugott’s account, an expression is subjective if it expresses someone’s attitude or belief. A subjective expression may encode the participant whose attitude is expressed. Therefore, for Traugott, any instance of a SOUND-class verb, with or without a TO-phrase, is subjective because it expresses an experience located in someone’s consciousness.

For Langacker, an expression is more subjective if the participant whose consciousness is invoked is “offstage”. For an expression to be subjective, the consciousness involved must not be expressed in the linguistic form of the utterance. Once there is a linguistic form that refers to them they become in some way objective. There may be some truth in Langacker’s observations as far as they apply to SOUND-class verbs. When there is no TO-phrase, a SOUND-class verb is maximally subjective because it expresses a belief of the speaker’s. However, once there is a TO-phrase, it becomes less subjective, because it is possible to locate the belief in the consciousness of a third party in an entirely non-subjective manner, as in Peter sounds charming to Jane.
Without a TO-phrase, the subjectivity of *John sounds charming* is the same as the subjectivity of *John might be charming*. The claim must be that the speaker is the agonist of ‘sounding’ and the proposition the agonist. We can say that SOUND-class verbs are subjective because, by default, the speaker is a force-dynamic participant in the situation defined by the verb. Because the force-dynamic orientation of these verbs extends beyond the sentence into the speech domain, they are deictic. What is pointed at is the utterer. By default, a SOUND-class verb identifies the speaker as the person whose belief is being expressed. This default can be overridden by a more specific case, an agonist identified in a TO-phrase.

### 5.2.4 The force-dynamics of SOUND-class verbs and aktionsarts

The fact that the force-dynamic organisation of the sense of SOUND-class verbs is between the proposition and the speaker offers us a natural way of capturing the stativity of the verbs. Typically, I would expect a verb involving a force-dynamic opposition not to be stative, but to be dynamic. I characterise dynamicity as taking place when there is finite energy input on the part of at least one of the participants in a situation type, in our folk characterisation of that situation type. The senses of SOUND-class verbs should, for this reason, be dynamic. The reason why they are not dynamic, however, is that, although there is a force-dynamic opposition, the dynamicity does not involve the referent of the subject as the agonist. Another reason is that SOUND-class verbs are deictic. No verb where this is the case can be dynamic, it seems. Modals, for example, also involve force oppositions yet they are stative. One possible account for this is that the force-dynamic character of the modals is not limited to the referents of the linguistically expressed syntactic valents of the verb.

With this account, we can explain how sometimes these verbs can be dynamic. In section 2.4.1.5, I showed that SOUND-class verbs could occur with agentive subjects. The diagnostics for agency that I presented were the ability to occur in the progressive and occurrence with a manner adverb like DELIBERATELY. Progressivity is not, by itself, a good diagnostic of agency. There are a number of raising constructions that can be progressive. There are progressive passives, and
there are constructions with non-referential subjects like there is ceasing to be any disagreement and there are threatening to be more accidents. Purpose clauses and manner adverbs like DELIBERATELY are excellent diagnostics of agency. It is clear that the examples in (23) have agentive subjects. The examples in (23) are, therefore, not instances of the evidential senses of these verbs.

(23)  a. Jane is looking scary (to frighten off the boy she doesn’t want to date)
     b. Jane is sounding angry (to hide the fact she’s scared)
     c. Jane is deliberately looking scary
     d. the teacher is deliberately sounding scary

In addition, I argued in Chapter 1 that there was a close relation between the agency of the subject and the presence of the TO-phrase. If the subject was agentive, the TO-phrase could not occur. There are examples in (24).

(24) a. Jane is deliberately looking scary (*to me)
     b. Jane is looking scary (*to me) to frighten off the boy she doesn’t want to date

The issue is how we capture the variable aktionsart of SOUND-class verbs and whether we can relate the variable aktionsart to the ability of a TO-phrase to occur.

The analysis of the experiencer as a force-dynamic participant in the sense of the verb makes it possible to arrive at a unified analysis of both of these phenomena. Dynamic SOUND is not an instance of evidential-1 or evidential-2 SOUND. Either it is a dynamic instance of attributary SOUND, or it has a sense which has elements of evidential-1 SOUND and attributary SOUND. The referent of the subject is an argument of the sense of dynamic SOUND, so it can not be evidential-2 SOUND. However there is no way that we can see dynamic SOUND as being a dynamic version of evidential-1 SOUND because it does not encode a belief. Given that dynamic SOUND is not evident in meaning, and cannot occur with a TO-phrase, a
possible analysis of the dynamicity of this verb lies in the organisation of the force-dynamics of the attributary sense.

The diagram in Figure 5.9 presents an account of dynamic ‘sounding’. It captures the semantic structure of \textit{Jane is (deliberately) sounding angry}. For simplicity’s sake, I have not represented \textit{deliberately} or the progressivity in the diagram. In the diagram, the sense of \textit{sounding} is an instance of ‘acting’; otherwise, the structure is just as it is for attributary \textit{SOUND} in Figure 5.3.

\begin{figure}[h]
\centering
\includegraphics[width=0.8\textwidth]{figure59.png}
\caption{Figure 5.9}
\end{figure}

The diagram is different from Figure 5.3 in two respects. First, the subordinate situation is represented as the ee of the superordinate situation, and, secondly, the superordinate situation is represented as an instance of ‘acting’ rather than ‘being’.

In this way, the attributary sense of \textit{SOUND}, which in 5.3 does not involve force-dynamics, is analysed as involving force-dynamic relationships. They are conflated in the er and ee relationships. The reanalysis of the semantic relations of \textit{SOUND} is related to the reclassification of the sense of \textit{SOUND} as an instance of ‘acting’ rather than of ‘being’. On the view developed in Chapter 4, dynamic situations involve some kind of force-dynamic transfer.

Figure 5.9 is different from Figure 5.8 in how the force-dynamic relations are assigned. But additionally, there are differences in structure. The fundamental configuration of semantic relations alters, not just the way in which force opposition is construed. The evidential senses of ‘sounding’ had an experiencer, however that relation is analysed, because they were instances of ‘believing’. ‘Sounding’ in Figure 5.9 cannot be an instance of ‘believing’: there is no belief and there is no believer. It must instead be an instance of ‘acting’ (perhaps as in stagecraft) because it means
something that its subject does in order to appear in a particular way. The sense of *sounding* in Figure 5.9 is therefore different from the sense of *sound* in Figure 5.8 in terms of what it inherits from.

This simple statement of the organisation of the force-dynamics of SOUND-class verbs captures a number of problems quite elegantly. First, we can handle the epistemic modality and the subjectivity. Secondly, we can handle the relationship between the dynamic and stative instances of the verb and their ability to occur with a TO-phrase experiencer.

### 5.2.5 The relationship of ‘sounding’ to ‘hearing’

Siewierska (1991: 126) states:

> Whereas subjective modalities mark the truthfulness of the proposition from the point of view of the speaker, evidentials indicate the factuality of the proposition in terms of how the speaker has obtained knowledge of it.

There is a slight terminological confusion in that my evidential senses of SOUND-class verbs correspond to Siewierska’s subjective modalities and her evidentials correspond to my HEAR-class verbs with propositional complements. However, we can see that her observation is correct: SOUND-class verbs capture the truthfulness of the proposition from the point of view of the speaker; HEAR-class verbs indicate the factuality of the proposition in terms of how the speaker obtained knowledge of it.

Siewierska’s observation applies best to the evidential-1 sense of SOUND-class verbs and to the ‘see3’ sense of SEE (and its equivalent sense in the other sensory modalities). It is only the ‘see3’ sense of SEE that involves both a proposition and an element of physical perception. The ‘see3’ sense of SEE is the sense that is found in examples like (25).

(25) Jane saw from his wounds that Peter had been mugged
In an example like (25), physical perception is central in providing the information that gives rise to the proposition. The similarities between the evidential-1 sense of LOOK/P and the 'see3' sense of SEE shown in the diagrams in Figures 5.11. Figure 5.10 presents the structure of *Peter looks happy*. Figure 5.11 presents the structure of the example in (25). For the sake of simplicity, I have not replicated the complex structure of physical perception seeing in the diagrams. What is important for the purposes here is the relationship between physical perception and other elements in conceptual structure.

In Figure 5.10, c5 is the speaker.

In both cases, the significant detail is that the proposition is the ee of an element which is a result of perception. However, the differences between *looks* and *saw* are,
first, that the sense of saw is synoptic, covering both physical perception and an instance of knowing; and, secondly, the sense of looks is an instance of believing which is the result of seeing.

The relationship between the examples in Figures 5.10 and 5.11 fits Siewierska's quote exactly. Figure 5.10 is subjectively modal, whereas Figure 5.11 indicates the sensory source of the information which gives rise to the proposition. As the propositional complement of saw in Figure 5.11 is presupposed and it can be denied, as we saw in Chapter 3, HEAR-class verbs are modal too, although the modality is not a subjective one. It is this kind of modality that fits the pattern Siewierska describes as evidential. However, there are relationships between the senses of SOUND-class verbs and HEAR-class verbs which do not fit the pattern so exactly.

Attributary SOUND-class verbs show slightly different relations to their HEAR-class counterparts. As they do not involve a belief or a state of knowledge, they do not fit the quote from Siewierska at the start of this section.

Attributary senses have been analysed (in Fig 3 above) as being instances of an action, with their related physical perception senses as a result. In this case, what is different between a HEAR-class verb and its SOUND-class attributary counterpart is that the latter assigns semantic relations to different syntactic valents. We look at attributary SOUND-class verbs in greater detail in the next section.

5.2.6 Attributary SOUND-class verbs

Attributary verbs have the semantic structure schematically represented in Figure 5.12.

![Figure 5.12](image)

Figure 5.12

What the structure in Figure 5.12 claims is that in an attributary sense of a SOUND-class verb, the sense of the verb is the er of the sense of the xcomp of the verb which
forms a head-sense (as described in Hudson 1990: 148-52) and the referent of the subject is the er of the head-sense of the verb. That is in *it tastes sweet* the referent of *it* is the er not of 'tastes' but of 'tastes sweet'. The senses of *tastes* and *sweet* combine to form a "complex predicate". Informally, we could state the rule like this: "the referent of the subject of an attributary example is the er of the head-sense of the xcomp of the verb". The rule states that the sense of the xcomp is not predicated of its subject, but that it forms a complex predicate with the sense of its head. A more exact analysis of *it tastes sweet* is given in Figure 5.13.

![Diagram](image)

**Figure 5.13**

In neither Figure 12 or 13 is 'it' the er of 'sweet'. Attributary senses of SOUND-class verbs are quite exceptional in that the referent of their subject is not the er of the sense of their xcomp.

Evidence for the attributary analysis comes from the class of nominal counterparts to these verbs. In nominalisations of SOUND-class verbs, as in (26), there are two possible interpretations.

(26)  

a. Peter's look of despair  

b. Peter's smell of perfume

(26a) means that Peter was despairing and his appearance provided the evidence. (26b) can only mean that the smell is of perfume; that is, Peter has a smell and the smell is the same smell as the smell that perfume has. Returning to the verbs, we can see that LOOK/P cannot have an OF-phrase complement, although SMELL/P can. The examples in (27) show this.

(27)  

a. *Jane looked of despair
b. Jane smelt of perfume

As (27b) is alright, the er of the xcomp cannot be the shared subject, but its smell. The relation between look and of in (26a) is different from that between smell and of in (26b). Look in (26a) is a symptom of the emotion expressed in the prepositional phrase. Smell is not a symptom of anything. Together with the material in the prepositional phrase, it describes a quality of the possessor noun.

The examples with SMELL and TASTE have a different semantic structure from LOOK. If we look at the examples in (28), it is clear that neither SMELL nor TASTE can be a symptom of emotion in the same way.

(28)  a. Jane's smell of sweat/ perfume/ soap/ *grief/ *joy
       b. supper's taste of coriander/ salt/ wine/ *grief/ *joy

The reason for the difference is that the relationship between the OF-phrase and its head is different in these two cases. Look in (26a) behaves like a raising noun, with the er of of and the er of look as the same thing: the referent of Peter. In the case of the examples in (26b) and (27b), the er of the OF-phrase is the sense of smell. That is, the relation between smell and of is an attributary one, the relationship between look and of is a raising one. Either analysis is permitted by the grammar of OF because its er can enter into either structure.

A diagrammatic account of the semantics of Peter's look of despair is given in Figure 5.14.

![Figure 5.14](image_url)

This diagram shows the er of of as the referent of Peter. A similar diagram of supper's taste of coriander is given in Figure 5.15. I have not included a syntactic analysis in these diagrams.
Both diagrams are partly simplified. It should be clear that in Figure 5.14, the referent of Peter is the er of both 'look' and of 'of despair' whereas in Figure 5.15 the referent of supper is the er of 'taste of coriander'.

The attributary analysis is relevant in helping to account for some of the semantic ambiguity of the constructions that these verbs enter into and it is also appropriate in accounting for the historical development of the verbs. An attributary structure is very similar to a verb + adverb structure. There are examples and structure diagrams showing the similarities in Figures 5.16 and 5.17. The diagram in 5.16 shows how the dependents of sounds are built into its structure incrementally.

The diagram in Figure 5.16 states that c1, the sense of sounds is an instance of 'be'. It has as its result c2, an instance of 'hearing'. C3 is an instance of c1 plus its relations: it means something like 'be heard'. C3 is the er of the sense of lovely, which is c4. C5 is c3 modified by virtue of being the er of c4. It means 'be heard: lovely'. The er of c5 is c6, the referent of this music. The crucial similarity to ran below is that the
sense of *sounds* is an argument of *lovely* in the same way that the sense of *ran* is an argument of *quickly*.

**Figure 5.17**

As I discuss in the final section of this chapter, the earliest instances of these verbs were attributaries rather than raising verbs. We can, therefore, account for the word-class ambiguities of their xcomps with some ease. As Nevalainen (1995) shows, one of the problems in the history of *SOUND*-class verbs concerns the word-class of their xcomp. The requirement that the xcomp of these verbs should be an adjective rather than an adverb does not become established until the Nineteenth Century. Until it does become an established pattern, there is often an ambiguity: the word occurring after the verb could be either an adjective or an adverb (in some cases, in earlier varieties of English, adjectives and adverbs are morphologically similar). The emergence of the adjectival xcomp pattern is contingent on the emergence of a raising pattern of complementation for these verbs. I discuss this and similar issues in 5.4.

### 5.2.7 Predication vs attribution

The claim that the attributary sense of *SOUND*-class verbs is different from the evidential senses hinges on the nature of attributary structures. The structure involving an attributary *SOUND*-class verb and its xcomp is like the structure between a noun and its attributive adjective. In the case of an attributary *SOUND*-class verb, the verb and its xcomp fuse to form a single sense. In the evidential cases, and in more typical cases of raising and control, the sense of the xcomp does not fuse semantically with its head. Instead, it is predicated of the referent of its subject.
What this means is that the structures for attributary SOUND-class verbs look like the structures for typical transitive verbs like HIT in Figure 18.

![Diagram of HIT structure](image)

Figure 5.18

The diagram in Figure 5.18 says that the sense of HIT is built up incrementally as the dependents are added to it. 'Peter' is the dependent added first; the subject is always the dependent added last. In this way, we ensure that 'Jane' is predicated of the whole event, 'hit Peter'. Figure 5.18 presents a standard WG semantic account, as discussed in the introduction.

The atypical structure is the structure found in raising and control structures. In these cases, the sense of the xcomp does not form a head-sense with its head. The xcomp is semantically independent. A typical example for subject raising is given in Figure 5.19.

![Diagram of subject raising](image)

Figure 5.19

A typical example of subject control is given in Figure 5.20.
As we can see, the xcomp by itself does not form a head-sense with 'seem' or 'try'. It is the sense of the xcomp plus its er, 'Jane' in both cases that forms a head-sense. The exceptional thing about attributary senses of SOUND-class verbs is that they should involve xcomps -- the dependents that give rise to patterns like those in Figures 5.19 and 20-- yet they involve the semantic structures like the one in Figure 5.18.

5.3 Use and complementation
The next issue that needs to be discussed is the relationship between the different uses of these verbs, as outlined in 5.1, and the word-classes of the different kinds of xcomp. We have already seen that the xcomp's word-class is relevant to the semantic relation between the sense of the xcomp and the referent of its subject. The next issue to explore is whether the word-class of an xcomp limits the way in which the structure can be interpreted. For example, a noun xcomp can only be interpreted when the SOUND-class verb has an evidential sense. It can never be attributary. We need to see whether there are similar limitations on the other possible kinds of xcomp.

All SOUND-class verbs can occur with adjectives as their xcomps and, as the examples in (1)-(3) show, adjective xcomps are compatible with all three patterns. There are, however, two categories which can be the xcomp of a SOUND-class verb that still need to be discussed. One includes prepositions like OF and LIKE/preposition. These two prepositions do not behave in exactly the same way: OF is limited to SMELL and TASTE whereas LIKE/preposition can occur with any SOUND-class verb. The other includes subordinating conjunctions like
LIKE/subordinating conjunction, the compound subordinating conjunction AS THOUGH, and the related subordinating conjunction AS IF.

In the next two subsections, I go through the noun and adjective xcomp data again, in order to confirm that nouns are limited to evaluative patterns and that adjectives can occur with all three possible strings. In the two subsections after that, I analyse the prepositional xcomp data and then the subordinating conjunction data.

5.3.1 Nominal xcomps of SOUND-class verbs.
In this section I shall consider examples like those in (29).

(29)  a. Jane looks a nice person to me
       b. Peter sounds a nice person to me
       c. this fabric feels a rough one to me
       d. this pie smells a rancid one to me
       e. this wine smells a fruity one to me

Syntactically, these verbs all involve a sharing pattern: the subject of the verb is also the subject of the xcomp of the verb. The examples show that clear cases of SOUND-class verbs with noun xcomps are really limited to SOUND and LOOK. (29c-d) are only possible because of the identity of sense anaphora pronoun one. Examples like those in (30) are rather odd.

(30)  a. !this feels a rough fabric
       b. !this smells a nice pie
       c. !this tastes a nice pie

I take it, therefore, that judgements of category membership are not really possible with FEEL, SMELL and TASTE, irrespective of whether the category is gradable or not. The examples in (29) are evaluative and hence are raising or control examples rather than attributary ones.
With nominal xcomps, SOUND-class verbs cannot occur in the progressive, hence (31).

(31) a. *Jane is looking a nice person
    b. *Peter is sounding a nice person
    c. *this fabric is feeling a rough one

It is also not possible to conceive of the referent of the subject of the verb as responsible for the situation, hence examples like Peter is deliberately looking a nice man or I forced Peter to look a nice man are not acceptable. As I showed in 5.2.1, isa is the semantic relation between a noun xcomp of a SOUND-class verb and the referent of its subject. These verbs are always evaluative when they have a noun xcomp. In 5.2.4, I showed that when these verbs are evaluative the referent of their subject is never the agonist of the sense of the verb, even when it is the er of the sense of the verb.

All of the examples show that the noun xcomp has to be gradable. This is because the isa relation is not evaluable unless the category assignment in question involves a degree of membership prototype structure as well as a goodness of exemplar one. The important factor here is that the category which the xcomp refers to must be open to degree of membership evaluations, hence the restriction that the xcomp of a SOUND-class verb must be gradable.

These verbs must be raising or control, rather than attributary, in that they are uninterpretable with the sense of the verb as the isa relatum of the sense of the xcomp. The issue as to whether they are raising or control is a minor one. This is a judgement which can only be made on an instance by instance basis, depending on whether the sensory modality concerned provides the source of the information or not.

5.3.2 SOUND-class verbs and adjective xcomps

In this section I shall consider examples like those in (32). I discuss the evidence for claiming that SOUND-class verbs can be interpreted as (evidential) raising or control verbs or as attributary ones when they occur with adjectives as their xcomps. That is,
the string where the xcomp is an adjective is maximally ambiguous. (This point was
made in passing in 5.1.)

(32)  a. he sounds foreign
       b. it looks improbable that he will be found guilty
       c. this music sounds lovely

In (32a), the referent of he is the er of the sense of sounds and that his sound is the
evidence for his being foreign. In (32b), the referent of the subject is not the er of the
sense of the verb. You cannot hear or see a proposition.

The example in (32c) provides evidence for the attributary interpretation
because it is the sound that is lovely, not the music. It must be the sense of sound and
not its referent that is the er of the sense of lovely because sounds lovely forms a
complex predicate whose er is the referent of the subject of sounds.

The three senses of SOUND, which are all compatible with adjective xcomps,
have certain interesting aktionsartal properties. (32a-b) can be made progressive,
although (32c) cannot.

(33)  a. he is sounding foreign
       b. it is looking improbable that he will be found guilty
       c. !this music is sounding lovely

(33c) is unacceptable on an interpretation where this music refers to sheet-music.
However, this is not a necessary property of the attributary examples. (33a-b)
describe temporally contingent states of affairs; the semantic relations are irrelevant to
the ability of these verbs to be progressive.

In (33c), for the temporary state of affairs to be true, the music has to be
sounding lovely at the time that the words are uttered. The examples in (34) belong
ina context where the music is inherently lovely, and the orchestra is notorious for
spoiling it. However, at the time that (34a) is uttered, the orchestra is making a good
job of things. (34b) could be uttered of a time in the recent past when the orchestra ruined the music.

(34) a. the music is sounding lovely
    b. the music was sounding horrible

The examples in (34) are still attributary examples, in both cases it is the sound that is either lovely or horrible. The point is that the restriction on attributary examples occurring in the progressive is strictly pragmatic; the music has to be sounding lovely at the time of the utterance.

We can see from these examples that adjective xcomps can occur with all three senses of SOUND-class verbs. However, the division into evaluative and attributive meanings is supported by the wider facts even though the word-class assignment of the xcomp is the same in all of the cases.

5.3.3 SOUND-class verbs with LIKE/preposition and OF
In this section, I look at the behaviour of SOUND-class verbs with the two prepositions that they are restricted to having as xcomps. OF can only ever occur with SMELL and TASTE. When it occurs with those verbs, it only occurs with the attributary senses. A LIKE/preposition xcomp, like an adjective xcomp, is able to occur with both the evaluative and the attributive senses of SOUND-class verbs.

LIKE/preposition never occurs with an expletive subject. Even when the subject of the verb is IT, it is still referential. There are some examples in (35).

(35) a. it looks like Jane
    b. it sounds like Jane
    c. it feels like sandpaper
    d. it smells like ash
    e. it tastes like chocolate
These examples are ambiguous between evaluative (raising or control) and attributary interpretations. (35b), for instance, could mean “it is making a noise like Jane makes”, where the referent of it is the er of the sense of sounds and it is the sense of sounds that is like Jane; or “it appears from everything that I have heard that it must be Jane”; that is, it has an evaluative meaning. This ambiguity corresponds exactly to the attributary vs the evaluative meaning distinction that I discussed for adjective xcomps of SOUND-class verbs.

The LIKE/preposition xcomp facts are, therefore, very similar to the facts for adjective xcomps, except that with adjective xcomps it was possible for the perception verb to have no semantic relation between the sense of the verb and the referent of the subject. In the case of LIKE/preposition there must be a semantic relation, so the raising sense is never found with LIKE/preposition.

The ambiguity between evaluative and attributary meanings is not available for all of the sensory modalities. When they are complemented by LIKE, SMELL/P and TASTE/P only have an attributary meaning. This fact is related to their behaviour with OF. Only SMELL/P and TASTE/P can be complemented by OF, and this is because OF only occurs in attributary contexts. SMELL/P and TASTE/P are the verbs which are least likely to have an evaluative meaning. There are some examples in (36).

(36) a. it smells of coffee
    b. it tastes of chocolate

OF has a compositional meaning here. It does not suggest that the referent of it smells in a coffee-like way in (36a), nor does it suggest that the referent of it tastes in a chocolate-like way in (36b). Instead, what it suggests is that the sense of of restricts the range of possible smells or tastes.

We can compare OF with LIKE. It smells of coffee means that it has the same smell as coffee. It smells like coffee means that its smell is like the smell of coffee. Therefore, (37) is not acceptable.
(37) it smells like / of paint but it's actually not paint

If something smells of paint, it has the same smell as paint, therefore in all probability it is paint. The examples in (37) relate to category assignment. Examples like this coffee smells of paint suggests the presence of paint, not that the coffee is paint. The fact that the coffee is referred to by a fully referential noun-phrase overrides the category assigning possibility.

(38) it seems like Jane

The only available interpretation of seems in (38) is “I infer from all available evidence that it must be Jane”. This is exactly what we should expect, as the evaluative raising and control meanings of SOUND-class verbs are very similar to SEEM, excepting the possibility of an er relation between the sense of the verb and the referent of the subject.

The next issue to consider is the nature of the semantic relation between LIKE/preposition and the referent of its subject, in the evaluative meanings, and the sense of its head, in the attributary meanings. LIKE/preposition is an inherently relational word, so it always has an er and an ee. We can see that, in (39), the meaning of LIKE/preposition can mediate between two entities, an entity and a situation, and two situations.

(39) a. Jane is like Peter
    b. Jane seems like Peter
    c. Jane ran like Peter
    d. Jane ran like a rocket launch

In (39a) and (39b), like has the referent of Jane as its er and the referent of Peter as its ee. In (39c), the er of like is the referent of ran and the ee of like is the referent of a
running event with 'Peter' as er. In (39d), the er is the sense of ran and the ee is also a situation: the referent of a rocket launch. As with adjectives, er is always the semantic relation to the head or the subject of LIKE, and the semantic relation may have as its relatum things from any ontological class.

The situation is partly complicated by the fact that when the er of LIKE and the ee of LIKE are not in the same ontological category, we have to make an inferential bridge. In (39c) Jane’s running is, of course, not like Peter because there is no way that an event and a person could have sufficient in common that they could be compared. Jane’s running is like Peter to the extent that it is like Peter’s running, which is the only salient aspect of Peter. I take it that this kind of inferential bridging is pragmatic rather than semantic.

There is a second interpretation of (39c) which means “Jane ran just as Peter ran”, where the fact of Jane’s running is compared with the fact of Peter’s running. This interpretation involves an intonational break between ran and like and it is not relevant to my concerns in this chapter.

As we shall see in section 5.3.4 the relationship between adjuncts, attributary meanings and evaluative meanings is very close, and there is a clear development from attributary meanings to evaluative ones in the history of these verbs.

5.3.4 SOUND-class verbs and LIKE, AS THOUGH and AS IF

AS THOUGH and AS IF behave in the same way as one of the senses of LIKE/clausal, so I shall restrict myself to a discussion of LIKE/clausal in this section, apart from some minor observations about AS THOUGH and AS IF here. LIKE/clausal has two senses. The first is the same as the sense of LIKE/preposition, as in (40). The second is the sense of LIKE as in the examples in (41).

(40)  a. Jane looks like Peter
      b. Jane ran like Peter drives, fast.

(41)  a. Jane looks like someone’s walked across her grave
      b. Jane looks like there’s been a terrible accident
The meaning of LIKE/clausal in (40) is the same as the meaning of LIKE/preposition: 'resemble'. In the examples in (41), it is rather more complicated, in that it means that a hypothetical resemblance has been noted. To distinguish between the senses of LIKE/clausal (and between LIKE/clausal and LIKE/preposition), I shall use the following conventions: LIKE/c-h for hypothetical LIKE/clausal; LIKE/c-r for resembling LIKE/clausal and LIKE/p for LIKE/preposition. AS THOUGH and AS IF do not have a sense that corresponds to LIKE/c-r; instead, they have the same sense as LIKE/c-h.

We should treat AS THOUGH and AS IF as complex single word subordinating conjunctions. They behave in the same way as hypothetical LIKE/clausal so any remarks about that word generalise to AS THOUGH and AS IF.

In both its senses, LIKE/clausal is like LIKE/p in that it has an er and an ee. It can mediate between an entity and a situation or between two situations. The main analytical problem that LIKE/clausal presents is how to link its er and ee to its syntactic relations. I deal with the syntax of LIKE/clausal in 5.3.5 and I deal with the semantics of hypothetical LIKE/clausal in 5.3.6.

5.3.5 The syntax of LIKE/clausal
LIKE/clausal presents the problem of being a subordinating conjunction that introduces a tensed declarative clause which can function as both an adjunct and as a complement of its head. Typically, subordinating conjunctions are restricted to appearing as adjuncts, like AFTER, SINCE or WHILE, or as complements, like THAT. IF and WHETHER may both occur as both adjunct and complement, but they do not introduce tensed declarative clauses. FOR is another subordinating conjunction that can function as either an adjunct or a complement but FOR is a sub-case of FOR/TO (Hudson, 1990: 242-4) and introduces an infinitival complement.

On this basis therefore, and bearing in mind Hudson’s (1995b) evidence that the word-class complementiser is not well motivated, I think that LIKE/clausal, AS THOUGH and AS IF are in a unique word-class. The main grammatical issue concerns the relationship between LIKE/clausal and its head.
LIKE/clausal may be the adjunct of a noun, or of a verb. When it is the adjunct of a noun, its meaning is restricted to the 'resemble' meaning. When it is the adjunct of a verb it may have either meaning. When it is the complement of a SOUND-class verb, or of SEEM, its meaning is restricted to the hypothetical meaning. There are examples in (42).

(42)  a. a man like Jane was before her gender re-assignment surgery
    b. Peter was playing like he played the week before
    c. Peter was playing like he had the spirit of Paganini inside him
    d. Peter sounded to me like he had the spirit of Paganini inside him

In (42a), like is the adjunct of man. In (42b-c) it is the adjunct of playing, but there is a difference between the two. In both cases like introduces a manner adjunct, but (42c) expresses a hypothetical resemblance between the manner of Peter's playing and his having the spirit of Paganini inside him, whereas in (42b) Peter's playing is compared with an earlier instance of Peter's playing. Like in (42d) is an instance of LIKE/c-h.

In the examples in (42) the assignation of the er of 'like' in (42a-c) follows the standard rules for linking ers of adjuncts. In all of those cases, the er of 'like' is the sense of the head of like. This is the standard process of reverse unification. In (42d), however, there is no standard rule for assigning the er of 'like'. LIKE/clausal, AS THOUGH, and AS IF are the only subordinating conjunctions I am aware of which introduce tensed declarative clauses and which have ers and which may occur as complements. I take it that any subordinating conjunction that can occur as an adjunct has an er.

I should, perhaps, consider the possibility that these words do not have ers as well as ees. Not all relational concepts are two-place predicates. Some, like FRIEND, are one-place predicates. A diagram for 'friend' is given in Figure 5.21.
The diagram in 5.21 states that the sense of the word FRIEND is the value of a relation, 'friend of'. The analysis is similar to Hudson's (1995a: 46-47) account of ENEMY. It could be possible to say, therefore, that the sense of LIKE was the value of a relation 'like'. We need, therefore, to review the evidence for claiming that LIKE, AS THOUGH, and AS IF are all two place predicates. The first evidence is in the meaning of the words: they all mean that one entity resembles another. In the case of LIKE/preposition this meaning makes it uncontroversial to claim that 'like' has both an er and an ee; indeed, the claim that it has both an er and an ee is substantiated by its occurring as the xcomp of traditional raising verbs like SEEM in structures like she seemed like Jane. A claim that LIKE/clausal has only one argument suggests that it ought to have the same distribution as THAT, which has no er and does not therefore do anything other than instantiate the semantic requirements of its head.

As the complement of SOUND-class verbs, LIKE/clausal does not behave like THAT. Instead certain properties of its character as an adjunct remain. Most importantly, in an example like (42d), like has an er and an ee and its er is the referent of Peter. This linking arrangement is the one that is typical of xcomps; indeed, if we can claim that LIKE/clausal is an xcomp then the linking rule for its er is very simple: the er of the sense of LIKE/clausal links to the referent of the subject of the head of LIKE/clausal. However, analysing LIKE/clausal as an xcomp of SOUND-class verbs raises some problems at the same time as it simplifies the linking issue. The problem is that the only cases of tensed xcomps are LIKE, AS THOUGH, and AS IF when they are the complements of SOUND-class verbs, or of SEEM. Actually, LIKE/clausal can occur in structures with SEEM as in (43).

(43) a. Peter seemed like he’d been hit over the head
b. Jane seemed like she was really happy

The occurrence of *like* in the examples in (43) suggests very strongly that it is an exceptional xcomp. This makes LIKE/clausal different from THAT.

This problem is compounded by the fact that (42d) is ambiguous between a raising and a control interpretation. If the sense of SOUND is the evidential-2 (raising) sense, the referent of *Peter* is not the er of 'sound'. In these circumstances, I might utter (42d) on the basis of some information about Peter's talents that you tell me. If, on the other hand, the sense of SOUND is the evidential-1 (control) sense, I might utter (42d) on the basis of actually hearing Peter performing. In either case, Peter, or some quality of his, is compared to the property of being possessed by the spirit of Paganini. That is, either interpretation of (42d) makes the referent of Peter the er of 'like'.

In these circumstances, it might be best to analyse LIKE/clausal as an exceptional xcomp when it is the clausal complement of a SOUND-class verb. There is some evidence in favour of such an analysis.

- LIKE/clausal can occur as the complement of WITH in absolute phrases as in (44).

(44) a. Jane regretted her sex-change operation and she started to behave like the man she used to be. With Jane like she was before she had her sex-change operation, her partner was confused

b. Peter and Jane were driving along the motorway when all of a sudden Jane went catatonic -- as though she had seen a ghost. With Jane like she had seen a ghost, Peter had to take over the driving

In (44a), *like* is an instance of LIKE/c-r, in (44b) it is an instance of LIKE/c-h. In both of the examples in (44), *Jane* is the complement of *with* and *like* is the xcomp of *with*. *Jane* is the subject of *like*. This structure is the same as the structure of other absolute phrases, such as *with Peter in prison* and it is clear evidence that tensed declarative clauses headed by LIKE/clausal can be xcomps.
• LIKE/clausal can occur as the complement of SEEM when SEEM has a fully referential subject. However, when SEEM has THAT as its complement, there cannot be a fully referential subject. There are some examples in (45).

(45)  
a. Jane seems like she is drunk  
b. *Jane seems that she is drunk

SEEM is always a raising verb. It only has one argument and that argument is always a proposition. If SEEM occurs with a referential subject, its subject is always shared with its xcomp. If SEEM occurs with a tensed clause as its complement, its subject is expletive and co-referential with the tensed clause, as in (46).

(46)  It seems that Jane is drunk

If the referent of Jane in (45a) is the er of 'like' then the most straightforward analysis of the syntax is that Jane is the subject of like and that like is the xcomp of seems. This would make LIKE/clausal, AS IF and AS THOUGH exceptionally capable of being xcomps even though they are subordinating conjunctions whose complement is a tensed verb.

This aspect of the grammar of LIKE/clausal means that we do not need to identify different lexemes for LIKE/clausal where one can be an adjunct and the other can be a complement. There are no other grounds for identifying different lexemes for LIKE since either sense of LIKE/clausal can function as an xcomp or as an adjunct. Furthermore, lots of lexemes can be both adjuncts and complements: in principle, it is worse to identify two lexemes LIKE/clausal, one that can be an adjunct and that has an er, and one that can only be a complement and that has no er, than to allow LIKE/clausal to be an exceptional xcomp.

However, there is a usage of LIKE/clausal where it may be appropriate to recognise a different lexeme. The examples in (47) show a case where like does not have an er;
or, at least, the er of *like is not the referent of the subject of the tensed verb. The reason is that the subject is expletive.

(47)  
a. it seems like/as though Peter has gone home  
b. it looks like/as though Peter has gone home

It looks at first as though *like in (47a-b) is behaving like *that in (48a). However, (48b) shows that *that cannot occur with LOOK.

(48)  
a. it seems that Peter has gone home  
b. *it looks that Peter has gone home

The examples in (48) show that LIKE/clausal cannot be replaced by THAT as the complement of a SOUND-class verb. This fact may be idiosyncratic, simply indicating that SOUND-class verbs select LIKE, but it may be indicative of a substantial difference between LIKE/clausal and THAT even as the sole argument of a raising verb. Furthermore, LIKE/clausal cannot be the subject of SEEM, although THAT can. There are examples in (49).

(49)  
a. that Peter had gone home seemed obvious to everyone  
b. *like Peter had gone home seemed obvious to everyone

I take it that the examples in (49) show that there are substantial differences between like and THAT.

The data are these: (i) LIKE/c-h can occur as the sole referential argument of both SEEM and of SOUND-class verbs; (ii) SEEM can have a THAT-clause behaving in the same way but SOUND-class verbs cannot; (iii) THAT can be the subject of SEEM, whereas LIKE/c-h cannot be the subject of anything. This suggests that in
LIKE/c-h is not an extraposed subject and that, even as the complement of SEEM, LIKE/c-h does not behave in the same way as THAT. 46

There are two possible approaches to these data. The first one assumes that there is a further sub-sense of LIKE/c-h. The sense we have already encountered has an er and an ee and may be an xcomp. This is the LIKE/c-h that we find in examples such as Jane looked like she'd been frightened. The new sub-sense of LIKE/c-h has only an er/ee which is the referent of its tensed verb complement. Consequently, it is not able to be an xcomp as it cannot have a semantic relation with the referent of its subject. This would be the sub-sense of LIKE/c-h that we find in (47) and (49). This analysis accounts for the properties of LIKE/clausal which are like THAT but it cannot account for LIKE/clausal when it does not behave like THAT.

An alternative account would claim that (47) and (49) show that LIKE/clausal is unlike THAT even when it occurs with an expletive subject. Subordinating conjunctions which can occur as subjects clearly have no semantic relation that they assign up the dependency chain so we could claim that the inability of LIKE/clausal to be a subject (as well as the consequential unlikelihood of its being an extraposed subject) suggests that it still has both an er and an ee, at least when it is the complement of a SOUND-class verb.

In examples like (47b), the syntax and semantics are out of step. Like is a syntactic dependent of look. The sense of like, however, forms a semantic unit with its head. That is, the semantic structure of it sounds like the dog is angry is "'sound-like'---ee--> proposition". The claim is that when a SOUND-class verb is complemented by clausal LIKE, and it has an expletive subject, a new complex-predicate is formed. This kind of structure is similar to the attributary structure described in 5.2.6

There is some evidence for this view from nominalisations of SOUND-class verbs. If we take the examples in (50), it is clear that the semantic phrasing involves

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46 Dixon (1990: 201) points out that SEEM cannot have a clausal subject without an xcomp because examples like that something had gone wrong seemed are unacceptable. He shows that SEEM can have a clausal subject with an xcomp as in that something had gone wrong seemed possible. My point here is that LIKE can never be a clausal subject in either context. *Like something had gone wrong seemed possible is ungrammatical.
the LIKE-clause forming a unit with the percept-noun that it is an adjunct of. It is not the case that the LIKE-clause is an argument of the percept noun, and, consequently, it is not the case that the LIKE-clause is coreferential with the expletive subject *there*.

(50) a. *there was an appearance/look like Jane was drunk again*
    b. *there was a sound like Jane was drunk again*
    c. *there was a feel/ feeling like ghosts were at large*
    d. *there was a smell like Jane was drunk again*
    e. *there was a taste like Jane was drunk again*

This structure is, therefore, not the same as the one in (51).

(51) *there was a feeling that ghosts were at large*

In this example, the THAT-clause is coreferential with *feeling*. (Incidentally, the sense of *feeling* in (51) is different from that in (50c). (51) does not involve a physical impression, whereas (50c) suggests that the feeling has a physical manifestation of some kind.)

The argument from the paraphrases is not watertight. One of the problems that it faces is that not all of the examples are perfectly acceptable. For example, (50a) is not easy to get and I think that *appearance* and *look* do not have the same sense as raising LOOK/P. They need an er. (51c) is slightly problematic in that it is unclear what the right noun is, and what the sense of *feel* or *feeling* is. This problem is compounded by the extensive polysemy of FEEL/P.

(50e) is fine, but it does need some context. Typically, TASTE/P has a relation to a thing that can be tasted. *Taste* in (50e), which shares the meaning of TASTE/P does not have such a relation. However, it is possible to use the noun TASTE in just this way if the context is right. For example, burning rubber does not just have a characteristic smell, it also has a characteristic acrid taste. If Jane typically burnt rubber when she was drunk, either (50d) or (50e) would be as felicitous as either *it tasted like Jane was drunk again* or *it smelt like Jane was drunk again.*
This analysis means that SEEM and LIKE/c-h must have a different structure to SEEM and THAT. The fact that there is no coreferential relation between the expletive subject of SEEM and LIKE/c-h although there is such a relation when the complement of SEEM is THAT is some evidence that they do in fact have different structures.

The diagrams in Figures 5.22-5.24 present the following analyses: Figure 5.22 looks at SEEM and THAT, where *that* is coreferential with the expletive subject of *seems*; Figure 5.23 examines SEEM and LIKE/c-h, where 'seem like' forms a complex semantic unit whose ee is the referent of the tensed verb complement of *like*; Figure 5.24 considers SOUND and LIKE/c-h where the structure is the same as that in Figure 5.23.

![Figure 5.22](image)

The structure is the typical one of coreference which is usually assumed for subject raising verbs when they occur with tensed declarative clauses as their complements.

![Figure 5.23](image)

In the diagram in Figure 5.23, c2, the sense *like*, is the ee of c1, the sense of *seems*. At the same time, c1 is the er of c2. C3 is an instance of the fusion of c1 and c2; it corresponds to something like 'seems like'. As 'like' still has an undischarged
argument, its ee, the referent of *has*, c4, which means 'something awful has happened' is linked to c3 as its ee.

Although I have argued that there are grounds for preferring this analysis, it is non-standard in some respects. First, the er of 'like' is filled before its ee, secondly, there is a mutual dependency pattern between c1 and c2 which is quite non-standard.

Figure 5.24 takes the same analysis and applies it to SOUND.

![Diagram](image)

In an analysis of Figure 5.24, the only fundamental difference between this structure and that of Figure 5.23 would be the greater specificity of the meaning of SOUND that that of SEEM which I have not represented in the diagram.

The advantage of this analysis of the alternative is that it maintains a unitary view of the words involved. It is clear that LIKE/c-h is always an instance of LIKE/clausal and that it always has the same number of semantic relations. Furthermore, it is clear that the raising senses of SOUND-class verbs behave in a manner consistent with BE and SEEM when they have expletive subjects and LIKE/clausal complements. That is, this analysis, which rests initially on the assumption that LIKE/clausal can be an xcomp preserves the greatest possible simplicity in the grammar for the cost of an idiosyncrasy in the grammar of a word-class with three members.

Although the structure in Figure 5.24 is similar to the structure in attributary cases described above, the meaning is still one of the evidential meanings of SOUND-class verbs as strings like *it sounds to me like Jane’s had too much to drink again* testify.
5.3.6 The semantics of hypothetical LIKE/clausal

The er of LIKE/c-h may be a situation or a thing. The ee must always be a situation. There are examples in (52).

(52) a. giving up smoking sounds like it is a hard thing to do  
    b. Jane sounds like she is a bit mad

In (52a), the er of 'like' is a situation, the referent of giving up smoking. In (52b), the er of 'like' is the referent of Jane. In both cases, the ee is a situation. It is the referent of it is a hard thing to do in (52a) and of she is a bit mad in (52b). (52a-b) show how the 'hypothetical' element of the meaning of LIKE/clausal is arrived at. (52a) makes an evaluative assertion about a situation: giving up smoking. (52b) compares an entity, Jane with a situation that involves her. 'Like' potentially mediates a comparative relationship between things from different ontological categories as in (52b). This is clearly part of a modal process of hypothesis formation. 'Like' also compares situations with other situations. Given that situations are less stable than other entities, this element of the process also appears to be modal and hypothetical.

Rogers (1974) is particularly exercised with the issue of whether there is a grammatical association between the subject of the subordinate clause and the subject of the SOUND-class verb. In the examples in (52), it is co-referential with giving and she is co-referential with Jane. However, it is not the case that there is a requirement that the subject of the SOUND-class verb be associated with a pronoun in the lower clause as the examples in (53) show.

(53) a. Jane looks like something terrible has happened  
    b. the dogs sound like there is a burglar on the prowl

In the example in (53a), 'like' mediates a comparative relationship between the referent of Jane and a situation which need not involve Jane; in the example in (53b), it mediates a relationship between the referent of the dogs and a situation that certainly does not involve the dogs.
There is, therefore, despite Rogers (1974), no need to establish rules which account for the pronoun in the subordinate clause which is coreferential with the subject of the SOUND-class verb. As we can see from the examples in (53), the association across clauses is a matter of bridging reference (Matsui 1993, 1994) and so it is a pragmatic rather than a semantic issue.

We have seen that the sense of LIKE/c-h is one that hypothesises a resemblance between its er and its ee. LIKE/c-h is, therefore, a kind of modal subordinating conjunction. The ee of LIKE/c-h is always a situation. If the er of 'like' is a situation it must be a participant in the subordinate situation. If it is not a situation but an entity, the pragmatic process of bridging reference assignment ensures that some kind of appropriate connection is drawn.

There is one other relevant semantic fact: "neg-raising" is possible over LIKE/c when it is the xcomp of a SOUND-class verb or of SEEM.

(54)  
a. Jane sounds like she's not very old  
b. Jane doesn't sound like she's very old  
c. Jane seems like she's not very old  
d. Jane doesn't seem like she's very old

Neg-raising shows that the sense of SOUND in (54) must be either the raising or the control sense, rather than the attributary sense, because neg-raising is limited to non-factive verbs (Horn 1989) and, as we saw in the introduction of the Chapter, both evidential senses of SOUND-class verbs are non-factive while the attributary use is, possibly, factive. (54a) and (54b) are ambiguous between a raising and a control interpretation, they could involve either evidential sense.

SOUND-class verb + LIKE strings that have an expletive subject must therefore involve an evidential sense, even though I have offered a structural analysis which looks like the analysis of attributary senses, because they allow neg-raising too. This is as I claimed in the diagram in Figure 5.24. We can therefore be certain that in all cases LIKE/ clausal appears with only the evidential senses of SOUND-class verbs.
5.4 The history of SOUND-class verbs

There are three problems in the history of these verbs. The first, which I shall not address is the development of the different senses. The second, which I discuss in this section, deals with how the post-verbal element should be analysed. It appears in the early history of these verbs that they require a post-verbal adverb. I argue that the grammatical similarity between xcomps and xadjuncts makes this a plausible analysis of the constructions. The third issue concerns the establishment of a dynamic sense.

The development of the evidential senses from an attributary sense follows the classic pattern of subjectivisation. The emergence of the control meaning involves the formation of a secondary predicate. Verbs like LOOK and SOUND move from being verbs that require adverbial modification to being verbs that mediate a relationship between the subject and the predicative complement. Next, the emergence of the raising sense involves the loss of a semantic argument relation between the subject and the verb which is found in the grammaticalisation of the modal auxiliaries, for example. Furthermore, the development of the meanings of these verbs moves from not encoding a speaker judgement to encoding one. The evidential-2 sense is, arguably, the most subjective of the three possible senses. The verbs in (1), (2) and (3) in the introduction to the chapter appear to confirm Traugott’s unidirectional hypothesis.

In contemporary English, all three meanings co-exist. However, verbs referring to the more distal senses, such as sight and hearing appear to prefer an evidential meaning while SMELL and TASTE prefer the attributary meanings. The fact that all three meanings can co-exist gives rise to a degree of ambiguity in some examples.

5.4.1 The classification of the predicative complement

Nevalainen (1995), addresses the issue of the word-class of holwe (“hollow” or “hollowly”) and what its grammatical relation to looked should be in her discussion of looked in (78).

(55) As leene was his hors as is a rake,
And he was nat right fat, I undertake,
But looked holwe, and therto sobrely. (Gen. Prologue to C. Tales 286-8)

Of this case, she says that Mustanoja considers this to be a Latin-influence literary form in Chaucer but that Jespersen states that “predicative adverbs may occur instead of adjectives with verbs of appearance. This is common with verbs such as LOOK in Shakespeare.” She also says that this usage is common in the Early Modern English section of the Helsinki Corpus (Kyto, 1991), giving the following examples.

(56) I warrant you Coach after Coach, letter after letter, gift after gift, smelling so sweetly; (E2 COME SHAKESPEARE 45)

(57) and there being another house pretty close to it hight built with such a tower and lanthorn also, with the two churches towers and some other building pretty good made it appear nobly at a distance; (E3 TRAVEL FIENNES 151-2)

(58) it can receive no Light but at the Doors and Window of the Porch, whereby it looks most solemnly; (E3 TRAVEL FRYER 1, 186)

Nevalainen says that there are two possible analyses of these strings. One is to analyse the predicative complements as adjectives. She does not see this as a plausible strategy, because the low productivity of -ly adjectives cannot be squared with the frequency of words ending in -ly that occurring this context. In addition, -ly adjectives have “specialised metaphorical and moral senses” which are not evident in examples like those in (56)-(58). The other analysis is to see the adverb as a predicative complement of the verb, but only in the context of this small class of verbs. Nevalainen (1995) concludes that predicative complements which look like adverbs are adverbs, and that this pattern constitutes “a weakly codified area of grammar”.

47 The citations in (55), (56), (57), and (58) are all from Nevalainen (1995). The material in parentheses locates the text in the Helsinki Corpus according to the conventions of Kyto (1991). Consequently, all Helsinki Corpus material is referred to as Kyto (1991).
The analysis of these examples is straightforward. They are cases of SOUND-verbs with attributary senses. None of the examples in (57)-(58) could be included in a *to judge by...* paraphrase, as the examples in (59) show.

(59)  
  a. *to judge by their smell, they are sweet*  
  b. *to judge by its appearance, it was noble*  
  c. *to judge by its appearance, it is solemn*

On the other hand, all of the examples could be paraphrased by adjective + noun strings, as the examples in (60) show.

(60)  
  a. *they have a sweet smell*  
  b. *it has a noble appearance*  
  c. *it has a solemn look*

In each of the cases in (56)-(58), the verb and its predicative complement form a semantic unit which is then, in turn, predicated of the subject as the examples in (59) and (60) demonstrate. Nevalainen’s Early Modern English examples can, therefore, be accounted for by analysing them as attributary examples of SMELL, APPEAR and LOOK.

The reason why adverbs become less and less common as the predicative complement of LOOK and SOUND is related to the emergence of the evidential senses. These senses result in the predicative complement forming an independent secondary predicate, which takes the referent of the subject of the verb as its er. In such cases, in contemporary English, the predicative complement is obliged to be an adjective. It is a rule of English grammar that adverbs can only modify verbs and sentences. Once there is a regular control construction involving the evidential-1 sense, the predicative complement of these verbs will be obliged to be an adjective. Adjectives, unlike adverbs, are capable of modifying nouns. We can account for the loss of the adverb as a predicative complement in terms of the emergence of the evidential senses.
Some early examples are ambiguous. In (55) above, an adjective and an adverb are conjoined as the predicative complement of *looked*. Assuming the attributary analysis of *looked...sobrey*, it is necessary to assume an attributary analysis of *looked holwe*. In Chaucer, as now, an adjective predictive complement of these verbs can be attributary. Furthermore, there are examples like that in (61), taken from the OED.

(61) So hungriliche and holwe sire Heruy hym loked (1377)

This could be paraphrased as “Sir Hervy had a hungry and hollow look” but the presence of *hym* suggests that a better paraphrase would be “Sir Hervy looked so hungry and hollow to him”. The *hym* shows that this is a judgement, and what is being judged is the proposition that Sir Hervy is hungry and hollow. The sense of *looked* in (61) is, therefore, an evidential-2 sense. The example in (61) shows that it was possible in the Fourteenth Century for adv&v'ks to modify entities other than verbs and sentences. The story of the predicative complement of LOOK and SOUND is, therefore, not just a story about the grammaticalisation of LOOK and SOUND; it also involves the grammaticalisation of the English adverb system, and the restriction of the environments that they can occur in.

There is a complication to the story, however. In the Nineteenth Century, there is a brief flurry of SOUND-class verbs with adverbs as their predicative complements, but which have evidential senses. By the Nineteenth Century, adverbs have, in all other contexts, become restricted to modifying only verbs and sentences.

(62) a. On the whole, however, things as yet looked not unfavourably for James (1849)

b. It tasked the art of Kneller to make her look tolerably on canvas (1855)

c. Things had, by that time begun to look badly for all concerned (1891)

The examples in (62) are taken from the OED. (62b) is interpretable as an attributary example, but the other examples are clearly control or raising examples. I cannot
account for this curiosity. It was a short-lived possibility and one that, I think, may have been limited to literary language.

5.4.2 Development of the senses

These verbs develop with initial attributary meanings, and the emergence of evidential meanings is a later development. The evidential-2 meanings develop from the evidential-1 meanings. The earliest evidential-2 example for LOOK that I have found is in (63) (from the OED).

(63) How base a thing it is, and how unnaturally it looks, that men should value Money than the Law of God. (1683)

The extraposition in (63) shows that this is an example of raising, in this case with an adverb as the predicative complement. The possibility of adverbs as the predicative complements of these verbs derives from their having an attributary construction as their first, and initially most frequent, construction. In time, the possible predicative complement of these verbs becomes limited to adjectives. As is to be expected in a case of grammaticalisation, there is a considerable degree of overlap between the senses and the complementation pattern. Once adverb predicatives are not possible, these verbs fall in line with other raising and control verbs in English.

5.4.3 Changes in contemporary English

In the discussion in section 5.4.1, I claimed that the presence of hym in (61) was evidence that the sense of looked in that case was control-LOOK rather than attributary LOOK. In contemporary English, LOOK and SOUND can occur with a TO-phrase which indicates the experiencer of the verb. There are some examples in (64), which indicate that it is a speaker judgement that is under consideration.

(64) a. he sounds foreign to me
    b. he looks ill to me
There is an example of a TO-phrase experiencer in (65) (from the OED), which reveals the writer's judgement.

(65) It looks to me to be narrow and pedantic, to apply the ordinary ideals of criminal justice to this great public contest (1775)

In this case, the extraposition shows that the sense of *looks* is the raising sense. The TO-phrase is an argument of the verb: its semantic role is fixed by the verb. As it does not stipulate its own semantic role, it cannot be an adjunct. The TO-phrase is also evidence of emerging, or increasing, subjectivity. It indicates that the proposition that *looks* in (65), (the idea that to apply the ordinary ideals of criminal justice to this great public contest would be narrow and pedantic) is a personal or subjective judgement.

In contemporary English, this subjectivity has been encoded in the meanings of the verbs under consideration to such an extent that by default we accept the control and raising examples as being indicative of speaker orientated beliefs. The *to me* phrases in (64) are, in some way, redundant. We would assume them anyway.

The example in (61) shows that it was possible to construe these verbs with an experiencer at least from the Fourteenth Century. A subjective interpretation is compatible with the example in (61), where the subjectivity is that of the narrated subject. However, examples like (63) show that subjectivity was not necessarily encoded into the meanings of these verbs, even when it is clear that the instance of LOOK has a raising sense. Indeed, it is arguable that the presence of *to me* in (65) is a function of a need to express the subjectivity directly.⁴⁸ It appears, therefore, that as part of their grammaticalisation as control and raising verbs, these verbs become more subjective. We would assume that, by default, they expressed a speaker opinion.

⁴⁸ Wright (1995) points out that there are two distinct usages of the term *subjectivity* in the literature. Traugott's, as in Traugott (1989), refers to speaker attitude or meaning. Langacker's usage of subjectivity, as in Langacker (1990) is related to his analysis of how verbs profile situations. He consequently draws a distinction between *it looks nice* and *it looks nice to me*, claiming that the second is less subjective than the first, because the experiencer is 'onstage'. Here, I use subjective and subjectivity as Traugott does, and not in Langacker's sense.
Given that they always encode a subjective judgement, either that of the speaker or the referent of the TO-phrase, we need to identify how the speaker is encoded into the meaning of the verbs. I have argued that the speaker/TO-phrase argument of the verb is a force-dynamic argument of the verb as in Sweetser's (1990) analysis of deontic and epistemic modality. In Sweetser's (1990: 64) analysis of MUST, she says that epistemic MUST compels the speaker to reach the conclusion embodied in the sentence. That is, there is a force-dynamic relationship between the proposition and the speaker encoded by MUST in examples like that in (66).

(66) Jane must be in Manchester by now -- she left four hours ago.

This analysis of epistemic modality is clearly relevant to the analysis of raising and control LOOK and SOUND. If I state something like (67a), I am compelled to the conclusion in the proposition by Jane's appearance. If I state something like (67b), I am compelled to the conclusion in the subordinate proposition by some information that is visually available to me.

(67) a. Jane looks drunk (to me)
    b. tomorrow's weather looks good for a sailing trip

On this basis, therefore, I conclude that the speaker (or referent of the TO-phrase, who may be the speaker) is a force-dynamic argument of the sense of LOOK or SOUND or similar verbs when they have a raising or control sense.

There is, however, evidence that these verbs are undergoing a process of desubjectivisation. Rogers (1974) claims that these verbs are always stative and that the subject of the verb is never an agentive argument of the verb. He claims, that they can never be progressive, that they cannot be the complement of FORCE or PERSUADE and that they cannot occur with manner adverbs. However, although it was not possible for Rogers or his informants to have these verbs in these contexts. I find the examples in (68) all perfectly acceptable.
(68)  a. Jane is looking drunk
      b. I persuaded Jane to look drunk
      c. Jane deliberately looked drunk, in order to fob off the attentions of the man
          she disliked

Ljung (1980) notes that the progressive is perfectly natural with SOUND-class
perception verbs. The examples in (68) are all perfectly acceptable. However, the
examples in (69b-c) are unacceptable.

(69)  a. Jane is looking drunk to me
      b. !I persuaded Jane to look drunk to me
      c. !Jane deliberately looked drunk to me

(69a) is acceptable, but only on the basis that the progressive is construed non-
agentively. Such a construal of the progressive would depend on interpreting it as
referring to a temporally limited situation although it could possibly be an example of
the experiential progressive in Wright's (1995) terms.

When a verb occurs in the frames indicated in (69b-c) what is being
investigated is the agentivity of the subject. In these cases, the subject is being
construed as an agentive element, responsible for its appearance. Furthermore, the
agentive subject is incompatible with the presence of the TO-phrase. In addition, it
blocks the interpretation of such sentences as speaker judgements when there is no
speaker indicated. I discussed the force-dynamics and agentivity of these examples in
5.2.4. There, I argued that the sense of a dynamic SOUND-class verb was attributary,
but a reanalysed attributary sense with force-dynamic participants.

In these cases, what has happened is that the subject has come to be interpreted
as being force-dynamically responsible for the situation. If we accept Rogers' data we
can only assume that the reanalysis of the force-dynamic relations is a modern
phenomenon. Even if we do not accept Rogers' data, it is fair to assume that the
establishment of an agentive and dynamic variant of the attributary sense of these
verbs is a modern phenomenon.
There is a further point. The establishment of a dynamic agentive attributary sense is at odds with Traugott's (1982, 1989) unidirectional hypothesis. While the development of the evidential senses from the attributary sense is consonant with her hypothesis, the development of a dynamic attributary sense reinforces the propositional (in Traugott's terms) nature of attributary SOUND-class verbs. For the unidirectional hypothesis to be borne out, it would be necessary for the attributary senses to disappear eventually.

Clearly, the fact that these verbs are not unequivocally agentive unless they occur in agentive contexts shows that this nature of the subject as an agentive element in the meaning of the verb has not become fully encoded in the grammar. The necessity for agentive contexts suggests that what is found in examples like (68) is a case of what Traugott calls pragmatic strengthening. But, nevertheless, it is clear that it is necessary to consider whether desubjectivisation is a phenomenon elsewhere in the grammar.

5.4.4 Conclusions
In this section, I have shown that SOUND-class verbs have three senses: an attributary sense, and two evidential senses. I have shown how the presence of the attributary sense can account for the historical presence of a predicative adverb and how the evidential senses are later developments than the attributary sense. I have also shown how these verbs show increasing subjectivity associated with their grammaticalisation. Finally, I have discussed the current changes in the force-dynamic status of these verbs arguing that in agentive contexts, the subject of the verb is construed as being a force-dynamic participant whereas in non-agentive contexts, the force-dynamic relations hold between the speaker and the proposition as in cases of epistemic modality. This last process is a form of desubjectivisation.
Chapter 6
Conclusions

The most important point to emerge from this study concerns the relationships between the verbs' senses. In each case, there is an element of physical perception which is identifiable as a significant element in the decomposition of the sense of each of the verbs. I have explored some of the consequences of the embodiment hypothesis in the analysis of SEE; I have looked at the representation of dynamicity and agency in the case of LISTEN-class verbs; and I have shown how SOUND-class verbs fall into two domains of meaning, the evidential and the attributary. In all of the cases, these investigations into the meanings of the verbs have been tied to an account of the syntactic valency of each of the verbs. In the sections below, I discuss some of the consequences of the discussion in the previous chapters.

6.1 Semantic consequences

6.1.1 Relationships between the senses

One assumption that has been tacit throughout this study is that semantic relatedness does not entail a productive relationship of morphological derivation. We have seen that there is a consistent relationship between the elements of meaning present in the HEAR-class verbs, which are also part of the definition, potentially, of the other two classes of verbs.

The senses of the HEAR-class verbs are related in different ways to the other two classes of verbs. With the exception of LOOK/A, LISTEN-class verbs encode the sense of their HEAR-class counterpart as a result or an effect of their sense; for FEEL/A, SMELL/A and TASTE/A the HEAR-class sense is an obligatory part of the LISTEN-class sense. For LISTEN, it is an optional part. LOOK/A has a different structure from the other verbs in this class, which relates to the thematic nature of 'see1', and consequently its sense is a dynamic 'gazing'. We have been able to account for the dynamicity of LISTEN-class verbs in terms of a force-dynamic structure, which also captures the agency of these verbs, and I have been able to account for the absence of
a direct semantic relation between the verb and its object, for the transitive verbs, and between LISTEN and TO.

One surprising factor is the inconsistency within this class: there are three different types of semantic structure which the LISTEN-class verbs conform to. In one respect this makes the problem of linking more acute. If one small set of closely related verbs cannot behave consistently, what hope is there for a convincing linking theory? On the other hand there is a nice iconicity in the semantic patterns for LISTEN-class verbs: those verbs that entail perception have direct objects; LISTEN, which optionally involves perception, has an oblique; and LOOK/A, which does not entail perception, does not have a second syntactic valent. It is possible to conclude that this study provides further evidence for the position of Levin and Rappaport (1991), namely that describing the relation between syntax and semantics requires a high degree of semantic specificity in a fine grained account.

The relationship of the SOUND-class verbs to the HEAR-class verbs presents a different set of conditions. The most surprising element of this connection is the fact that SOUND-class verbs are defined as results: HEAR-class verbs are profiled in the senses of SOUND-class verbs as being the reason why a particular inference or understanding is arrived at. The second factor is that these verbs have three different senses, the two evidential senses and the attributary sense. One of the significant conclusions of this study has been the identification of the attributary sense; no earlier accounts make mention of this sense, even those as careful as Dixon (1991). Again, there has been some variation noted within the class. Particularly, it is clear that the perceptual modalities of seeing and hearing are more likely with an evidential sense, while those of smelling and tasting are more likely with an attributary sense.

The HEAR-class verbs have, therefore, been at the core of this study. In Chapter 3, I concentrated on an analysis of SEE: parts of that analysis extend to the other verbs, particularly the analysis of its force-dynamics, temporal co-extensiveness with a reported situation, and its aktionsart. However, even within this class of verbs there was a certain disunity among the verbs. The sense of SEE has a thematic nature which is not found in the senses of the other verbs.
Perhaps the most striking part of the analysis of HEAR-class verbs was their complexity. In all cases, there was a perceptual trace, which travels, as it were, from the percept to the perceiver. And yet, despite the complexity of the verbs in terms of their semantic decomposition, there was a simplicity in their meanings, compatible with the embodiment hypothesis, which was due to the underspecification of certain aspects of their meanings. Hence HEAR-class verbs are neither punctual nor durative: their temporal specification is determined by the nature of the particular situation of perceiving.

6.1.2 The nature of semantic relations

There have been other semantic consequences of this study. The most significant has been the unpacking of the er and ee prototypes. This has had two consequences. First, it has been possible to examine the nature of agency. We have been able to identify agentive elements in the senses of the LISTEN-class verbs, without having to have recourse to conditions on the agent entity, as in Dowty (1991), or having to discuss different kinds of causation, as in Pinker (1989). Agency has been identified as a force-dynamic concept. It too has a prototypical nature, and the semantic subordination found in the meanings of unergative verbs, as opposed to the comparatively simpler structure of the meanings of unaccusative verbs, is one device that we could use in accounting for the higher degree of agency the subjects of unergative verbs appear to evince.

Another conclusion concerns the nature of the semantic relation experiencer. This has been shown to have two quite different characteristics. In the case of the HEAR-class verbs, with the exception of SEE, the experiencer is the er of a ‘perceiving’ situation. We could, quite properly, assume that verbs that are instances of ‘perceiving’ constitute their own semantic field, in Jackendoff’s (1983) sense of that term. However, there is a further fact which is consistent across the whole HEAR-class of verbs. In the case of each of these verbs, the perceiver is the location of the perceptual trace. My claim is, therefore, that there is a localist account for the experiencer of HEAR-class verbs and the location is the mind of the perceiver.
The experiencer of SOUND-class verbs is quite a different matter. This is a force-dynamic relationship and it captures the modality of SOUND-class verbs. I analysed the experiencer of SOUND-class verbs as being equivalent to the subjective element in epistemic modality. I have shown that experiencer is not a single uniform semantic relation. It is not necessary to include it in an inventory of semantic relations and, indeed, to do so would be unhelpful given that it would be necessary to establish which kind of experiencer was being discussed.

One final consequence of the discussion of semantic relations in this thesis has been the conclusion, supported by the nature of the analysis in other authors, such as Jackendoff (1990), that force-dynamic and localist relations are of essentially different characters. Localist relations are determined by the situation of which they are a relation, whereas force-dynamic relations have a different, independent, nature and can be involved in determining the situation type.

I have also shown that it is possible to have a constrained semantic representation in which semantic relations are basic and which is not syntax dependent.

6.2 Relations between syntax and semantics

A theme throughout the thesis has been that it is necessary to establish both the syntactic and the semantic structure of a construction; from an identification of each of these domains, it is possible to sketch an account of the relationship between them. I have not attempted, nor shall I attempt here, to outline the mechanism by which the link between syntactic and semantic structure can be established. The linking rules belong in a separate, and potentially larger, research project than this. But it is possible from this thesis to make some predictions about what the correspondences would look like.

WG assumes that there is a minimum of three domains of representation: the phonological; the syntactic; and the semantic. A lexeme stores all three types of information and a word inherites the relevant information from its lexeme. For example, EVERY says that its syntax is that of a singular pronoun (or determiner) and its instances refer to distributed sets. In the entry for a word like EVERY there is
clear evidence that syntax and semantics can be out of step and that there is need for a plane of syntactic information distinct from a plane of semantic information.

In the case of the verbs that this thesis has examined, it has been necessary to maintain the assumption that syntax and semantics can be out of step. The decompositional account of the senses of the verbs rests on the assumption that there is no one-to-one correspondence between the planes of the grammar. It has been profitable to assume a decompositional model: in this way, I have been able to account for a number of features of the verbs.

The assumption that syntax and semantics are out of step was demonstrated in the initial sections of Chapter 3. Valency includes a statement about the category of the relata and the nature of the relationship. In the discussion of the range of valency possibilities of SEE and the range of senses associated with them, it became clear that there is not a one-to-one correspondence between syntactic entities and the ontological categories of the senses of those entities.

This conclusion, by itself, raises problems for those theories of linking that seek to identify which element out a range of semantic possibilities can be identified as the possible subject, for example. Dowty’s (1991) case is for a linking system which assumes that certain relata are more likely to be a possible subject entity than others.

This is not to say that linking is impossible in WG. However, further research is necessary and it will have to state whether linking regularities are constrained in terms of the nature of the semantic and syntactic relationships, or whether they are constrained in terms of the entities which are in a dependency or semantic relationship. Certain aspects of the theory make an account of linking very plausible indeed: the prototypism of both syntactic and semantic relations ensures that it is possible to make linking statements which can be overridden; and the clearly marked distinction between relationship and relata ensures that linking regularities can make reference to the nature of the relata, but that it has to be explicit.

The most significant prospect that WG offers in terms of linking regularities is in not needing a further plane of representation between the semantic and the syntactic. The prototypical nature of semantic relations and dependencies ensures that it is possible to link directly from one to the other without there being any mediating
level of argument structure either as an additional stratum of semantic representation or as a stratum of syntactic representation. It is a potential advantage of WG that it can use the same relations within word meanings and within the grammar.
Bibliography

Abbreviations

CLS: Papers from the Regional Meeting of the Chicago Linguistics Society.
CUP: Cambridge University Press.
LAGB: Linguistics Association of Great Britain.

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