MODALITY AND THE **V WH** PATTERN

By

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Abstract

Research into modality has tended to focus on modal auxiliary verbs (modals) at the expense of other forms that may express modal meaning. This thesis takes a phraseological, exploratory approach to the investigation of modal meaning by focusing on modal expressions with verbs with wh-clause complementation (the V wh pattern). The approach first tests the hypothesis that the pattern is associated with markers of modal meaning and then goes on to conduct a concordance analysis of samples of frequently-occurring V wh verbs taken from the British National Corpus. This analysis first categorizes these verbs into semantic sets and then explores which realizations of different types of modal meaning – obligation, volition, potential, and uncertainty – are most often found with verbs in particular sets. The presentation of the results of this analysis also involves a discussion of how exponents of modal meaning other than modals extend the range of expression available to users of English, indicating what an exclusive focus on modals will tend to overlook.

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Note on coding conventions used and works frequently cited

italics   wordforms, for example *specify*

SMALL CAPITALS   the lemma; SPECIFY stands for *specify, specifies, specified, specifying*

square brackets [ ] semantic sets, for example [describe] stands for the set of verbs with similar meanings to DESCRIBE (EXPLAIN, SPECIFY, SAY, TELL etc.)

bold typeface   grammar patterns such as **V wh**

single quotations used for quotations and technical terms

double quotations used for glosses of meanings

A reference book which is cited several times in the thesis is abbreviated thus:

CCED The Collins Cobuild English Dictionary (2nd edition) (Sinclair 1995)

Corpora referred to

BNC The British National Corpus

BoE The Bank of English

In some cases when presenting examples it has been necessary to omit some words which are not important to the meaning I am interested in. Such cases are marked **[…]** in the concordance lines. A further issue when dealing with (most)

corpora is that of errors that have either been introduced into the data during transcription or scanning or were there originally. Where they are noted, **[sic]** is used.

CHAPTER 1 – INTRODUCTION

1.1 General aim of the thesis

It has been widely noted that there are resources for expressing modal meaning beyond modal verbs and semi-modals, with various categorisations and forms suggested (Perkins 1983, Stubbs 1986, Halliday 1994, Hoye 2005, Hunston 2011). However, despite this wide recognition, corpus research is quite limited in this area, mainly confining itself to modals and semi-modals (Coates 1983, Leech 2003, Collins 2009). The result is that Stubbs's (1986, 1996) point that there is a need for 'prolonged fieldwork' in modality remains valid.

The aim of this thesis is to carry out some of this exploratory fieldwork by investigating what a lexical grammar approach (Sinclair, 2000, Hunston & Francis 2000) can bring to the description of modal meaning. More specifically, this thesis will consider an 'attractor' (Hunston 2011) of modal meaning, verbs with *wh*-clause complementation (the **V wh** pattern), in order to find out what is attracted. The research questions that the thesis seeks to answer are therefore:

- What can investigating **V wh** verbs as an attractor of modal meaning add to what is already known about the resources of modal meaning?

- That is, what main realizations of modal meaning beyond modals and semi-modals are attracted to **V wh** verbs?

- How are they related to modals and semi-modals?

- How does their investigation and description contribute to the phraseology of modality?

By taking this approach it will be argued that it is possible to extend the description of the resources of modal meaning.

1.2 Background

The importance of phraseology to a description of language is now widely acknowledged in applied linguistics (Granger & Pacquot 2008). This development is largely due to the advent of corpus linguistics (Stubbs 2007), research from which has consistently sought to break down distinctions between lexis and grammar (Römer 2009) in investigating 'the preferred way of saying things' (Gledhill 2000: 1).

This study is an investigation of how the phraseological insights of lexical grammar (Sinclair 2000, 2004) developing originally from the COBUILD project (Sinclair 1987) can inform the description of modal meaning. As the name suggests, in lexical grammar, description often starts with the word, or more accurately the surface form of a word, rather than the structure (Sinclair 1996), and seeks to investigate how the two interact with each other. Alternatively, one can start with a structure and investigate which words are associated with it (Francis

1993). Neither grammatical structures nor wordforms are seen as having meanings in isolation, just 'meaning potential' (Hanks 2013) which is realised in text. This view, as Sinclair (2000: 195) points out, contrasts with the 'slot and filler' approach of traditional grammar, where 'syntactic structures form a series of slots, and these are filled with choices from the dictionary'. It should also not be confused with the term 'lexicogrammar' as it is used in e.g. Halliday (1994), Hasan (1996) and Halliday & Matthiessen (2004), where lexical choice is seen as 'the most delicate form of grammar', the 'end point of a unique set of choices', rather than a two-way interaction between lexis and structure (Hunston & Francis 2000: 251)

By adopting this approach, lexical grammar has made considerable contributions to the description of language. The first and probably best known of these is the 'idiom principle' (Sinclair 1991: 110). This principle says that a large proportion of language in use is made up of 'semi-preconstructed phrases', the analysis of which reveals the pervasive nature of phraseological constraints, which are 'at least as important as grammar in the explanation of how meaning arises in text' (Sinclair 1991: 112). An example provided by Hunston & Francis (2000: 22) is *I must confess*, which in its usual meaning (which they paraphrase as 'I am going to tell you something you may find unpleasant or something I find embarrassing') is quite fixed; other grammatical options such as a change of person (*he must confess*) or polarity (*I mustn't confess*) are not generally available with this meaning (Hunston 2000).

A second contribution is a development from the 'idiom principle', the model

of the 'unit of meaning' (Sinclair 1996; Stubbs 2013). This model builds from a core item (normally a lexical word) to a phrasal unit by considering associated words (collocations), grammar (colligations) and semantic sets (semantic preferences); once the phrase is identified, it is also possible to identify its 'semantic prosody'[1], that is, attitude or evaluation of the speaker in using the phrase.

In the case of lexical grammar, then, the essential insight is that 'there is a strong tendency for sense and syntax to be associated' (Sinclair 1991: 65) and that, therefore, descriptions of language need to pay far more attention to the association between lexis and grammar in order to get at meaning. The new approach that enabled this insight to emerge was that of corpus linguistics and its methods of concordance and collocation analysis (Sinclair 1991). As Stubbs (2007: 128) notes, 'technological advances now provide access to large text collections and allow linguists to record and observe things whose existence was rarely imagined because they could never be directly observed'.

One influential product of the lexical grammar approach is pattern grammar (Francis et al.1996; Francis et al. 1998; Hunston & Francis 1998; Hunston & Francis 2000). This research has developed Sinclair's (1991) observation that the different syntactic patterns of a word are associated with the meanings of that word to show that it is possible to divide words which share complementation patterns

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[1] As Hunston (2007) points out, this use of the term 'semantic prosody' to refer to the 'attitudinal discourse function' of a **phrase** is different from the (probably more prevalent) use originating in Louw (1993) which refers only to positive or negative meanings a **word** has due to its semantic preferences.

into meaning groups. As Hunston & Francis (2000: 14) put it, '[g]rammar patterns … constitute an attempt to describe the whole of the language (or rather, all the frequently-occurring items in the language) in a principled way'. Pattern grammar indicates how a closer integration of lexis and grammar may be achieved by demonstrating the association between complementation pattern and meaning over a large number of patterns of verbs, nouns and adjectives. To take the example of the pattern investigated in this thesis, **V wh**, Francis et al. (1996) propose five main groups, ASK, THINK, DISCOVER, SHOW, and DETERMINE, each one of which contains a number of verbs with similar meanings; the SHOW group, for example, includes *demonstrate, indicate, reveal* and *illustrate*.

However, pattern grammar does not identify 'phrases' *per se*; patterns 'are often best seen as coming about because of a more pervasive phraseology than is represented by the pattern itself' (Hunston 2011: 123). This can be seen from the way that patterns such as **V wh** are divided into meaning groups; based on the observation that there is an association between meaning and form, the separation of verbs into different groups according to meaning suggests that verbs in similar groups will share phraseologies to some extent. Moreover, from the perspective of lexical grammar, the focus in pattern grammar on complementation patterns may overlook other potentially important phraseological information. As Hunston & Francis (2000: 37) acknowledge:

[t]hough complementation patterns are usually the most interesting facts

about verbs, there may be reasons for sorting [concordance lines] to the left, as this would show how often a verb occurs in the passive or infinitive, which modals it is often used with, what are its typical Subjects, whether it is frequently negative and so on.

This quotation suggests where work on the phraseology of patterns might start – by looking to the left of the verb – not to mention the methodology (concordance analysis) and the types of questions it might address. One of the most important of these is how modality, a major aspect of verbal meaning, interacts with the patterns of pattern grammar. If lexical grammar aims to explore how a phraseological description of the language looks, modality is an important area to investigate, but it has so far escaped the attention of studies in lexical grammar (with the exception of Hunston 2000). Adopting this approach means a commitment to building one's description on observations of co-occurrence patterns of words and to 'push[ing] the boundary that roughly demarcates the 'phraseological' more and more in to the zone previously thought of as free' (Cowie 1998: 20).

Modality can be argued to be such a zone. Previous research on modality has tended to focus on modal verbs and closely related items such as semi-modals, typically without detailed consideration of their typical co-occurrence patterns. The result of this is that while there is information about frequencies of modal verbs and some semi-modals, descriptions of other forms and frequency information are less

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extensive. There is also a lack of research that investigates the preferred ways of using these forms and thus their phraseologies.

It is not possible to address such issues in detail by looking at all the patterns of pattern grammar. This thesis focuses therefore on two closely related patterns, **V wh** and **V wh-to-inf** (for convenience of reference, I will use **V wh** in this thesis to refer to both of these patterns). The choice of these two patterns was informed by earlier work (Hunston 2003, 2008, 2011) which has suggested that they are associated with markers of modal meaning.

This thesis adopts the hypothesis that the meaning groups of Francis et al. (1996) and other broadly similar ones in other studies (Biber et al. 1999; Huddleston & Pullum 2002; Trotta 2000) are suggestive of larger phraseologies. It proposes a framework inspired by lexical grammar to classify typical elements of **V wh** clauses into 'meaning frames' which are broadly comparable with but of necessity more specific than meaning groups in the literature. Using these meaning frames, the aim is then to explore the types of modal meaning that they attract. This provides the framework within which it is then possible to investigate the types and exponents of modal meaning that co-occur with particular meaning groups.

1.3 Outline of the thesis

In line with the aim of this thesis to investigate what a phraseological description of modality might look like, Chapter 2 outlines current descriptions of modality, aiming

to derive a consensual definition of modality and of the main areas of modal meaning recognised in other studies. It argues that, in focusing on modal verbs and semi-modals, studies of modality have tended to underestimate the importance of other expressions of modal meaning; but also that the problem with going beyond modal verbs and semi-modals is one of description as well as discovery processes. Finally, it surveys the literature on the **V wh** pattern, considering why it might be a good candidate for investigation and what its distinctive features are.

Chapter 3 is divided into two main parts, the first of which is describes a preliminary quantitative study carried out to ascertain whether, and to what extent, forms thought to mark modal and modal-like meaning are associated with **V wh**. The issues identified in the evaluation of this preliminary study are then addressed in the qualitative research methodology described in the second part of the chapter, which introduces and explains the rationale for the 'meaning frames' detailed in Chapters 4-8. These sequences of elements generalise instances of **V wh** to frames such as [source] + [describe] + *wh* and [knowledge-seeker] + [find out] + *wh* which can then be used to investigate the kinds of modal meanings that occur with them.

Chapters 4 to 8 offer descriptions of meaning frames that have been grouped under the headings 'Finding out', 'Thinking', 'Knowing', 'Communicating' and 'Showing/Explaining/Determining', respectively. Each of these chapters looks in detail at the meaning frames in terms of the types of modal meaning that occur with them, and evaluates the resulting phraseologies.

Chapter 9 involves a discussion of the main achievements of the study as well as its limitations. It concludes by considering some of the implications of the study including what future research might address.

CHAPTER 2 – DESCRIBING AND INVESTIGATING MODAL MEANING

2.1 Introduction

The study of modality is an area which, even in 1983, Perkins was able to describe as having a vast literature and a range of approaches. An explanation for the interest modality has attracted is provided by Stubbs (1996: 202):

> 'Whenever speakers or writers say anything, they encode their point of view towards it: whether they think it is a reasonable thing to say, or might be found to be obvious, questionable, tentative, provisional, controversial, contradictory, irrelevant, impolite or whatever. The expression of such speaker's attitudes is pervasive in all uses of language. All utterances encode such a point of view, and the description of the markers of such points of view and their meanings is a central topic in linguistics'

That is, to understand an utterance fully, one needs to be able to decode the 'attitude' of the speaker[1] by grasping the import of the 'markers' Stubbs refers to. While not all studies agree with Stubbs that modality should be quite as widely drawn as suggested in this quotation, there is general agreement that speaker

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[1] This study follows Stubbs (2013) in using 'speaker' to refer to both speaker and writer

attitude is a central concept in modality, and that, as Depraetere & Reed (2006: 269) put it: 'modal utterances … do not represent situations as straightforward facts'.

The description of the markers of modal meaning is, for Stubbs (1986, 1996) 'a matter of prolonged fieldwork' involving corpus analysis. This study is an attempt to conduct some of this fieldwork. It is therefore the task of this chapter to outline the reasons why such fieldwork is necessary and why it is restricted to one area of grammar, verbs with *wh*-clause complementation. This first of all necessitates a review of previous approaches to modality and the categories of modal meaning that they propose, and then a survey of the forms which are usually considered in studies of modality and modal meaning. Finally, there will be a brief survey of the **V wh** pattern and why it might be a good candidate for this type of research.

2.2 Definitions of modality and categories of modal meaning

A useful starting point for the definition of modality and for approaching different types of modal meaning is that provided by Lyons (1977, 1981, 1995). This is the 'distinction between descriptive (or propositional) and non-descriptive (or non-propositional) meaning' (Lyons 1995: 44) or, in other terms, what is said and the (speaker's) 'attitude' towards it (the 'expressive component'). Similar distinctions are made by Stubbs in the quotation above, Givon (2001), and Halliday (1994), who contrasts 'ideational' and 'interpersonal' meanings. Different types of attitudes,

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how they are framed and the types of marker that are considered will decide the different types of modal meaning that are recognised.

Lyons' description of modality is also a good starting point because, as can be seen in Table 2.1, it focuses on two main types – what Bybee & Fleischman (1995) term 'supercategories' – of modal meaning, 'deontic' and 'epistemic', which the other studies listed build on to present more specific models. Moreover, as will be shown, the other models typically consider the more specific meanings either in terms of concepts introduced by Lyons or reject them to propose new ones.

Table 2.1. Categories of modal meaning in a range of studies

Lyons (1977, 1981, 1995)	deontic			epistemic		
Perkins (1983)	deontic	dynamic		epistemic		
	obligation permission	*volition necessity ability*				
Coates (1983)	root			epistemic		
	obligation necessity	*permission possibility ability*	*volition intention*			
Quirk et al. (1985). Biber et al. (1999)	intrinsic			extrinsic		
	obligation	*permission*	*volition*	*possibility (ability)*	*(logical) necessity*	*prediction*
Halliday (1994)	modulation			modalization		
	obligation permission	*inclination*		*probability*	*usuality*	
Huddleston & Pullum (2002)	deontic	dynamic		epistemic		
	obligation permission	*necessity possibility/ability volition*				
Gabrielatos (2010)	attitude to desirability			attitude to factuality		
	directed desirability	*non-directed desirability*		*attitude to propensity*	*attitude to likelihood*	

2.2.1 The 'supercategories': deontic and epistemic modality

The limit Lyons places on the meanings involved in modality is the extent to which a statement or a course of action can be analysed in terms of its *necessity* or *possibility*, an approach taken also by Kratzer (1981, 1991), Van der Auwera & Plungian (1998) and Furmaniak (2010) and deriving from the field of modal logic, where these concepts are used to establish logical equivalences (Garson 2014).

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As Table 2.1 indicates, Lyons (1977, 1981, 1995) recognises two main types of modality (in everyday language), 'epistemic' and 'deontic'[1], which also originate in modal logic and relate to questions of knowledge and obligation/permission, respectively. Markers of 'epistemic' modality make explicit reference to the extent to which an inference is justified on the basis of the speaker's knowledge (Lyons 1977). That is, in saying *He may have gone to Paris* or *Perhaps/I think he went to Paris* rather than *He went to Paris*, a speaker no longer makes a 'straightforward statement of fact' but instead shows that they infer that 'his going to Paris' possibly happened; *may, perhaps* and *I think* are here markers of 'epistemic possibility' (Lyons 1977). In contrast, stating *He must have gone to Paris* or *I know he went to Paris* indicates that, according to one's current knowledge, it is necessarily the case that his going to Paris took place. The introduction of markers of 'epistemic necessity' such as *must, necessarily* and *certainly* shows that this is no longer a 'categorical statement' but dependent on the speaker's potentially fallible knowledge. As Halliday & Matthiessen (2004: 147) put it, 'you only say you are certain when you are not'.

In contrast to epistemic modality, which relates to the contingency of knowledge, 'deontic modality is concerned with the necessity or possibility of acts performed by morally responsible agents' (Lyons 1977: 823), that is, the expression of obligation ('deontic necessity') and permission ('deontic possibility').

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[1] A third type, 'alethic', or 'aletheutic' modality is also mentioned, but is limited to philosophical discussions and thus seen as at best marginally relevant to everyday language use (Lyons 1977, 1981, 1995).

In uttering *you must not tell lies*, for example, reference is made to an obligation (or 'deontic necessity') on the listener to tell the truth, while *you may tell lies* would be usually be interpreted as granting the listener permission to tell lies. In both cases, reference is made to potential future events; 'deontic' modality is forward projecting – one cannot order, or give permission to, someone to do something they have already done (Lyons 1977, Coates 1983).

Lyons introduces an influential, although, as we shall see, somewhat problematic, distinction between 'subjective' and 'objective' modality which applies to both 'epistemic' and 'deontic' modality and which informs some of the distinctions provided in the other studies listed in Table 2.1.

In the case of epistemic modality, Lyons distinguishes between inferences based on the speaker's 'subjective' knowledge and those which rely on 'objective' knowledge. This distinction can be demonstrated by the two meanings that Lyons (1977) argues a speaker may have in mind in uttering *Alfred must be unmarried* expressing epistemic necessity, repeated here as (1) and (2).

(1)   "In the light of what is known, it is necessarily the case that Alfred is

        unmarried"   (Lyons 1977: 792)

(2)   "I (confidently) infer that Alfred is unmarried" (Lyons 1977: 791)

Gloss (1) would apply if, in uttering *Alfred must be unmarried*, one had some kind of independent verification such as *Alfred* being a member of a community in which

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everyone else's marital status had already been established (Lyons 1977: 798). In contrast, gloss (2), the more likely option (Lyons 1977, 1981), indicates that it is the speaker's judgement of the strong likelihood that this is the case. It is important to note that this distinction is proposed tentatively; it 'is not a distinction that can be drawn sharply in the everyday use of language' (Lyons 1977: 797). This seems to be the case in examples involving modal verbs, as here, where no linguistic marker of objectivity/subjectivity (e.g. 'subjective' *in my opinion*) is available. As Nuyts (2001) points out, this is relatable to the distinction made (e.g. by Palmer 2001) between 'epistemic' modality and 'evidential' modality, the latter a label applied to forms that explicitly refer to the evidence on which an inference is drawn (Chafe, 1986), some of which, such as *according to* and other reporting structures, are surveyed by Stubbs (1986, 1996).

The distinction between 'objective' and 'subjective' deontic modality, is based on the notion of the 'source' of the obligation. Where the 'source' is seen as the speaker, 'subjective deontic' modality is expressed, otherwise we have 'objective deontic' modality. Generally, in uttering an imperative sentence such as example (3), one 'creates, or brings into existence, a certain obligation' (Lyons 1977: 828) on the listener, in this case to avoid telling lies and one therefore identifies oneself as the 'source'.

(3)   Don't tell lies

(4)   It's wrong to tell lies.   (examples from Lyons 1977: 828)

(5)   You must not tell lies.

In contrast, examples (4) and (5) may express both 'objective' and 'subjective' meanings. An 'objective' interpretation sees such examples as making 'deontic statements' by referring to the existence of an obligation (not to tell lies); the 'source' in this case may be a set of moral principles, rather than the speaker's authority. A 'subjective' interpretation would have the speaker as taking responsibility for the imposition of the obligation. However, in the absence of 'parenthetical clauses like *I say so* or *X says so*' (Lyons 1977: 841), one cannot tell whether (4) and (5) are to be taken as meaning "I order you not to tell lies" or "there exists a prohibition against telling lies". The same arguments apply to the expression of permission by means of modal verbs; *you may enter* could mean "I (hereby) permit you to enter" or "it is permitted (by X) for you to enter".

Lyons (1977: 824) argues that a linguistic view of types of deontic 'source' should 'take a maximally inclusive view of what constitutes obligation, drawing no distinction, in the first instances at least, between morality, legality and physical necessity'. This is an important point, since, as will be shown below, other linguists (e.g. Perkins 1983, Palmer 1990, Nuyts 2005, Collins 2009) have argued that this distinction *should* be drawn, in particular with reference to dynamic modality.

In summary, Lyons (1977, 1981, 1995) takes a conceptual approach using terms taken from modal logic, and is not focussed on systematically exploring particular forms that realize modal meaning but in presenting examples that fit an

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existing framework. The *a priori* acceptance of necessity and possibility as underlying all modal meaning results in his overlooking types of modal meaning such as *volition*, which is not as easily analysed in those terms. The other studies listed in Table 2.1 all propose categories that are more closely tied to the analysis of linguistic forms, typically, but not exclusively, modal verbs. Since there is general agreement (no matter what the terminology used) regarding the distinction between 'deontic' and 'epistemic' meanings, the chief differences between these studies relate to how they deal with the more specific meanings, or modal 'notions' (Gabrielatos 2010), specifically *obligation/necessity, possibility, ability, permission, and volition*. These more specific meanings will now be considered in turn, to see how the studies listed in Table 2.1 distinguish between them.

2.2.2 The treatment of obligation and (non-epistemic) necessity in the literature

As noted above, Lyons (1977) introduces the notion of 'source' of obligation to make a conceptual distinction between 'objective' (speaker-external) and 'subjective' (deriving from the speaker) deontic modality, while warning that many instances will be ambiguous between the two readings. He also suggests potential types of source, including 'morality, legality and physical necessity'. A number of these studies (Coates 1983, Perkins 1983, Quirk et al. 1985, Huddleston & Pullum 2002) try to apply the distinction between 'subjective' and 'objective' deontic modality, generally, as in the case of Coates (1983) drawing the conclusion that

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this is a gradient rather than categorical distinction. Proponents of 'dynamic' modality argue a further distinction can be drawn between 'moral/social' and 'physical' necessity. Halliday (1994), meanwhile, rejects this approach to obligation, offering his own interpretation of 'subjective' and 'objective' modality, which will be discussed at the end of this section.

There are, then, two main approaches to obligation and (non-epistemic) necessity in studies apart from Lyons. Coates (1983), Biber et al. (1999) and Gabrielatos (2010) hold that obligation and (physical) necessity may be conceptually distinct but in the practical analysis of authentic examples such distinctions are unreliable. In contrast, proponents of dynamic modality such as Perkins (1983) and Huddleston & Pullum (2002), but also Palmer (1990), Hoye (1995), Collins (2009) and Van linden (2012) argue that it is possible to distinguish on the one hand between 'objective' and 'subjective' deontic modality, and on the other, between deontic obligation and dynamic (physical) necessity; Quirk et al. (1985) do not use this terminology but make similar points.

In order to illustrate these distinctions, it is necessary to consider some examples and their analyses. Two examples that Coates (1983: 33-34) provides to indicate opposite ends of her obligation-necessity gradient are repeated below as (6) and (7).

(6)   "You *must* play this ten times over", Miss Jarrova would say, pointing

        with relentless fingers to a jumble of crotchets and quavers.

Coates identifies the following 'features' in (6) which make it a 'core' example of obligation, conforming to the 'native speaker's psychological stereotype of Root MUST':

(i)   Subject is animate.

(ii)   Main verb is activity verb.

(iii)   Speaker is interested in getting subject to perform the action.

(iv)   Speaker has authority over subject.   (Coates 1983: 33)

The first two features are arguably easier to identify since they are co-textual; while all of the other studies here surveyed include examples which conform to Coates's(1983) description, only Biber et al. (1999) and Collins (2009) make reference to such co-textual features. The second two features are reliant on a description of the context in which the utterance is made and which is not always provided or is simply implicit, not just in Coates (1983) but through all the studies included in this section.

The analysis of these features being present in (6) leads Coates to a 'subjective' analysis – it 'can be paraphrased by 'I order you to play this'' (Coates 1983: 33). This is an analysis that is consistent with those in all the other studies that make reference to 'subjective' deontic modality. However, proposing this analysis disregards Lyons's (1977) point that modal auxiliaries such as *must* are

ambiguous and also make 'deontic statements' regarding the existence of an obligation. *Miss Jarrova* in (6) may well be issuing a directive and acting as a 'deontic source', but could equally be reporting or explaining the rules of a music competition. Moreover, Coates (1983) provides no explicit description of the context; we are not told who *Miss Jarrova* is, but are presumably expected to deduce that she is a music teacher based on the mention of *crotchets and quavers* and, on this basis, to accept that conditions (iii) and (iv) are met.

(7)   Clay pots ... *must* have some protection from severe weather.

Coates (1983) analyses (7) as having none of the 'core' features of obligation, which makes such instances more 'objective', as 'the speaker's involvement is minimal' (Coates 1983: 36). Once again, one can agree with the analysis in terms of features (i) and (ii), but since no context is provided, it is not possible to say anything for certain about (iii) and (iv), although the associated lexis suggests that this example may be from a gardening manual of some kind. Thus, analyses that are expressed in terms of 'context' can in fact be seen to be related to co-textual features which evoke a schema or script (Schank & Abelson 2013); 'gardening' in the case of (7) and 'music lesson' in the case of (6).

An alternative view of examples like (7) taken by proponents of 'dynamic' modality (and Quirk et al. 1985, who refer to 'root necessity') is that, in making reference to physical conditions, they express 'dynamic necessity', or lie on 'the

boundary between deontic and dynamic modality', (Huddleston & Pullum 2002: 184). Since little analysis is provided of such examples except reference to 'physical conditions', it is hard to know where Huddleston & Pullum's 'boundary' may lie, making reliable distinctions in terms of 'dynamic' and 'deontic' necessity difficult, if not impossible, to draw (Smith 2003).

In any case, Coates finds that most instances are somewhere between the two extremes represented by (6) and (7), and that there is no clear dividing line between 'obligation' and 'necessity'. Coates (1983: 33) acknowledges that 'it is often difficult to tell whether examples are subjective or not'. Collins (2009), also a corpus-based study, likewise finds the subjective / objective distinction an unreliable one, as does Smith (2003), in his analysis of a range of forms marking obligation and necessity (*must,* HAVE *got to,* HAVE *to, need and* NEED *to). Moreover,* Biber et al. (1999), although nominally using the same model of modality as Quirk et al. (1985) quietly drop the distinction between 'root necessity' and 'obligation or compulsion' used in the latter study. It is noteworthy that most studies that find the distinction between 'obligation' and 'necessity' difficult to draw are corpus-based ones while the majority that retain it are not.

This is where Halliday's (1994) analysis of obligation is arguably more suited to the analysis of everyday language. Halliday agrees with Lyons (1977) that examples of obligation like (6) above are 'ambiguous between proposition and proposal' (Halliday & Matthiessen 2004: 147). However, if one considers the forms that are available to express obligation, it is possible to distinguish the four different

'orientations' shown in Table 2.2. In this model, the expression of obligation is 'subjective' when the speaker takes responsibility for the judgement and or 'objective' when the speaker claims that it derives from another source. This responsibility is 'implicit' where the expression is integrated into the clause, and 'explicit' where it is expressed by means of a projection and the source of the modality is therefore explicitly identified. Thus, the distinctions proposed by Halliday, unlike those of Lyons, are based on formal differences.

Table 2.2. Halliday's model of obligation

	Subjective: explicit	Subjective: implicit	Objective: implicit	Objective: explicit
obligation	I want John to go	John should go	John's supposed to go	It's expected that John goes

2.2.3 The treatment of ability, possibility and permission in the literature

Ability (non-epistemic) possibility and permission are related in that their expression typically involves the same modal markers (*can, could, may,* BE *able to*). However, they are usually distinguished in the literature with reference to the 'source' of the possibility. The distinctions that Coates (1983) proposes are 'human authority/rules and regulations' for permission; 'external circumstances' for possibility; and 'inherent properties' for ability. These are a matter of general

consensus, but the application of these concepts to examples results in quite different categorisations (see Table 2.1).

The area of greatest agreement is 'permission'. Examples (8) and (9) are provided by Coates (1983: 88-89) with the explanatory notes in parentheses; similar examples can be found in Quirk et al. (1985: 222), Carter & McCarthy (2006: 639), Huddleston & Pullum (2002: 183) and Collins (2009: 100). Similarly to examples of obligation, Coates (1983: 87) notes that such instances tend to involve animate subjects and agentive verbs.

(8)   You *can* start the revels now (Personal authority)

(9)   Poppy *can't* drive (her car) because she hasn't got any insurance on it (Law)

In both (8) and (9), this permission reading sees the subject (*you* and *Poppy*) as being allowed (or not allowed) to carry out an action by some 'source' which is not explicitly specified (compare *He says you can start the revels now*). Example (8) is one of only two examples of 'subjective' permission Coates (1983: 87) finds[1]. This analysis seems to be linked to the second person subject but this is not made explicit (nor is it in the other studies cited above). Since no further context is

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[1] Collins (2009) finds permission to be rare in general with *can* and *may* (9.9% and 7% of instances, respectively). Biber et al. (1999) also find it to be rare, although less so in conversation with *can.*

provided, this is a difficult instance to evaluate, but it is similar to the example

provided by Carter & McCarthy (2006: 639) for the permission sense of *may*:

[spoken instruction to students taking a timed examination]

*You **may** start now.*

(permission: You are allowed to start now.)

The information that Carter & McCarthy provide that this is a spoken instruction is

helpful in assigning a permission meaning. At the same time, it is interesting that

the co-text in both examples includes *now*; of the 9 instances of *you may start* in

the BNC, the only two which clearly express permission are also followed by

adverbials of time (*at once*, *as soon as...*). It is also interesting to note that Carter &

McCarthy's paraphrase includes a form – *you are allowed to* – that Coates (1983)

and other studies in this section would class as 'objective', rather than 'subjective'.

Example (9), meanwhile, shows (lack of) permission because of the legal context;

reference to lacking *insurance* is already an indication that the use of *can* in this

sentence relates to permission.

Coates (1983) is unique amongst the studies in Table 2.1 (and unusual in

general) in classifying permission together with possibility and ability, but in

agreement with Quirk et al. (1985) and Biber et al. (1999) that it should be treated

separately from obligation as it involves different forms. In contrast, Gabrielatos

(2010) and Halliday (1994), like Lyons (1977) consider permission as a weak form

of obligation.

Ability and (non-epistemic) possibility tend to be distinguished according to whether the possibility is 'inherent' to the subject (ability) or derives from the situation (possibility). Coates (1983: 14) includes 'what has been learnt' in the notion of ability, pointing out that these types of 'source' are frequently difficult to distinguish in discourse. For Coates, the features that tend to distinguish instances of ability and (non-epistemic) possibility are the animacy / agency of the subject referent and the extent to which the verb involved 'denotes physical action/activity', a common theme for 'root' meanings.

(10) She *can* run the marathon in under 3 hours (Huddleston & Pullum 2002)

(11) I mean, you *can* travel from Belgium to France with much less palaver than you can travel from the North to the South of Ireland. (Palmer 1990: 84)

(12) Eucalypts that grow on nutrient-poor soils, however, *cannot* do this, because the lack of nutrients limits their growth. (Collins 2009: 102)

Huddleston & Pullum provide (10) as an example of ability, the analysis here appearing to rest on the fact that running a marathon is a matter of inherent capacity, which is the 'source' of the possibility here. Clear examples provided in the literature typically therefore tend to involve verbs referring to physical capacity (e.g. *singing* in Coates 1983) or learned skill (e.g. *speaking a language* in Quirk et

al. 1985, Palmer 1990 and Collins 2009). However, as Coates (1983) and Palmer (1990) point out, such clear examples are quite rare; Collins (2009: 101) quantifies this 'rarity', finding around 29% of instances of *can* with an ability meaning. More common are examples like (11), which 'represent judgments about the degree or extent that an action is possible' (Palmer (1990: 84), and (12), which Collins classifies as 'theoretical possibility', making note of the fact that the 'enabling circumstances' (or in this case, 'preventing circumstances') are explicitly mentioned here (he does not explicitly mention what these are, but they appear to be the *lack of nutrients*).

What can be seen then is that, while permission is typically seen as distinct from ability and possibility, the latter two are usually dealt with together, with ability is seen as 'a special case of the 'possibility' meaning' (Quirk et al. 1985: 222). The question remains where these notions 'belong' in the categorisation and how 'modal' they are. Coates's (1983) categorisation of these as 'root' is based on common features which she sees as precluding an epistemic categorisation. Proponents of 'dynamic' modality including Perkins (1983), Palmer (1990) and Huddleston & Pullum (2002), meanwhile, argue that ability and (non-epistemic) possibility describe supposedly objective characteristics of the subject referent or the circumstances, and are not really modal, since no speaker attitude is involved (Palmer 1990). Putting aside the fact that dynamic modality as a concept is not coherent, since it is at the same time 'concerned with the properties and dispositions of persons ... referred to in the clause, especially by the subject noun

phrase' (Huddleston & Pullum 2002) *and* the 'circumstances' that might affect the subject referent, Palmer's reference to 'judgments' in the quotation above suggest that it is 'speaker attitude' that is at stake. This is why the decision by Quirk et al. (1985) and Gabrielatos (2010) to place these meanings in a category which refers to speaker judgment of 'potential' (or Gabrielatos's term, 'propensity') appears more logical. Another proponent of 'dynamic' modality, Collins (2009: 103) also refers to 'the notion of potentiality' as uniting ability and possibility. The use of items with these meanings refers to the existence of potential without making any commitment to how likely the 'event' is to take place: 'any inferences regarding the likelihood of actualisation are the prerogative of the hearer' (Gabrielatos 2010: 140).

2.2.4 The treatment of volition and intention in the literature

Lyons (1977: 826) relates deontic modality to the 'desiderative and instrumental function of language', or the expression of 'wants and desires' (volition) and 'imposing one's will on other agents'. But he stops short of including the expression of volition within deontic modality, perhaps because it is not as amenable to an analysis in terms of necessity and possibility (cf also Van der Auwera & Plungian 1998, who use this as grounds for excluding volition from their analysis).

However, as can be seen in Table 2.1, volition – alternatively 'inclination' (Halliday 1994) or 'non-directed desirability' (Gabrielatos 2010) – is widely

recognised in other studies, covering very similar meanings. Coates (1983), Quirk et al. (1985) and Collins (2009) seek to distinguish between 'willingness' and 'intention'[1] with reference to examples involving *will, shall* and BE *going to*. However, the difference between them is not always very clear ''willingness' is ... salient to both meanings, since intending to do something presupposes willingness to do it' (Coates 1983: 173). Coates (1983) provides example (13) as an example of 'willingness' because it can be paraphrased with 'is willing/prepared to', while (14) is interpreted as 'intention'. However, Quirk et al. (1985) provide the very similar (15) as an example of 'willingness'.

(13)   I mean I don't think the bibliography should suffer because we can't find a publisher who *will* do the whole thing

(14)   I'*ll* put them in the post today

(15)   I'*ll* do it if you like.   (Quirk et al. 1985: 229)

The 'willingness' / 'intention' distinction is thus not necessarily one that is reliably made on the basis of instances involving modal verbs. However, but we can note that first person instances are more likely to commit the speaker to action (Coates 1983, Palmer 1990, Collins 2009); we cannot be sure about others' intentions (Coates 1983) which may explain why *is willing/prepared to* is a paraphrase in third

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[1] Reference is also made to 'insistence'; Quirk et al. (1985: 229) give the example *She would keep interrupting* me, but, as they (and Coates 1983) point out, this is a 'somewhat rare use'. It was not found in this study.

person instances such as (13). An alternative view is Halliday's (1994) consideration of volition in terms of three levels of meaning – *determined / keen / willing*, which lexicalises the different levels of commitment which are largely implicit in examples involving *will.*

As indicated in Table 2.1, volition is related to meanings such as obligation and permission in Quirk et al. (1985), Halliday (1994) and Gabrielatos (2010) by being placed in the same 'supercategories'; this categorisation draws attention to the association between expression of volition and making offers or requests. In contrast, studies such as Perkins (1983) and Huddleston & Pullum (2002) place volition in 'dynamic' modality on the grounds that expressions of volition essentially report the 'willingness … of the subject and not the speaker's attitude or opinion' (Hoye 1997: 44). This argument overlooks the fact that many instances of *will* and *would* with volitional meaning have first person subjects, in which case the speaker's attitude clearly *is* at stake.

A further point to raise concerning markers of volition such as *will* regards the potential ambiguity between prediction ('epistemic') and 'volition' meanings. This apparent ambiguity leads Huddleston & Pullum (2002) to argue that volition is not a separate meaning from prediction but an implicature arising in certain situations (Collins 2009). However, Coates (1983) identifies certain linguistic features that fairly clearly distinguish these two meanings. The *will* of volition is almost always associated with an animate subject and an agentive verb. In contrast, epistemic *will* is strongly associated with a range of features including

existential subjects – *there* in (16), stative verbs (16 - 17), passive voice (18) and inanimate subjects (17). These same features are associated with epistemic meanings of other modal verbs, e.g. *must* and *may* (Coates 1983).

(16) I mean *there'll be* his mother and and grandad so we won't be able to do anything exciting

(17) If the weights are clustered closely around the centre of gravity, **it** *will be* highly stable

(18) and his mount centre circle *will* now *be ridden* by John Haine

(all examples from Coates 1983: 178-182)

All of these examples are predictions – they present confident judgements of likelihood by the speaker. This is an important observation, corroborated by Biber et al. (1999), Hunston (2000) and Collins (2009); as Hunston (2000) points out, it provides evidence against the prevailing 'atomistic' view of modal meaning (seen in e.g. Huddleston & Pullum 2002) and for a view of modality that is 'located in the phrase rather than in the word' (Hunston 2011: 68). That is, modal verbs may have a number of potential meanings when considered in isolation, but these will tend to be resolved where relevant co-textual features are identified such as those noted by Coates (1983). However, Hunston (2000) aside, very little attention has been paid to the phraseology of modal verbs, possibly because they are considered too frequent and 'grammatical' to warrant collocational analysis (Perkins, 1997).

2.2.5 Towards a definition of modality

As we have seen this section, many studies of modality follow Lyons (1977) in emphasizing the role of speaker attitude in modal meaning (e.g. Stubbs 1986, 1996, Palmer 1990, Halliday 1994, Givon 2001, Huddleston & Pullum 2002, Nuyts 2005, 2006, and Gabrielatos 2010). The clearest cases of modality are generally agreed to be where a speaker 'intrudes' (Halliday 1970) to offer their judgement (or ask that of an addressee) regarding the possibility, desirability, likelihood or necessity of a particular state of affairs, which is consequently seen as in some way uncertain (Gabrielatos 2010). However, most studies (with Halliday 1994 as an exception), whether explicitly or implicitly, also allow into modality instances and categories where the speaker may not directly offering a judgement.

   Huddleston & Pullum (2002: 173) provide a good example of this, extending their definition of modality to include not just the speaker's attitude, but 'the attitude of persons referred to in the sentence'. They illustrate this with reference to example (19) below, where the inference indicated by *must* is attributed to *Kim*, not the speaker, 'but we shall of course still regard it as expressing modal necessity' (Huddleston & Pullum 2002: 173).

   (19) Kim *thinks* he *must have written* it himself (Huddleston & Pullum

         2002: 173)

Stubbs (1986, 1996) also takes the view that attributing a claim to a third party using a reporting structure such as *according to* in (20) is modal. However, it is no longer 'epistemic' but 'evidential' modality, although the two are clearly linked. Here the speaker defers judgement over whether or not there was a build-up to the *Water Board official* and is hence not committed to its factuality.

(20) *According to* a Water Board official, there had been a sizeable build-up
        of methane in the pipe. (Stubbs 1996: 198)

Examples of this kind show how speakers may employ linguistic devices to indicate varying 'degrees of certainty and commitment' depending on 'what credence is given to the source' of the information (Stubbs 1996: 199, Hunston 2011).

Reports of modal meanings extend to past forms such as *had to*, exemplified in (21), from the data in this study, although the reporting of past obligation is not about a current proposal, but a historical situation in which *Nicholas's son* was forced to make a decision. As Gabrielatos (2010: 136) argues, when, as here, 'a past desirability is reported, the modalised statement does not, in itself, explicitly state whether the desired state of affairs actually took place'. The use of *had to*, in other words, can be seen as a means of avoiding commitment as to whether the decision was actually made as well as a judgement on the part of the speaker that the activity in question was needed.

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(21) A regime that could not win a war on its own soil was ripe for reform. Nicholas's son *had to* decide whether and to what extent he was prepared to diverge from his father's methods. (BNC HY7 573)

While in examples (19)-(21) the addition of a modal marker clearly has an effect on meaning, there are also cases where modal marker is used without apparently adding a great deal. Huddleston & Pullum (2002: 179) introduce the term 'low degree modality' for instances such as (22) – (25) where 'it is difficult to detect any meaning difference at all'. For example it is not necessarily clear why *will be* is preferred to *is* in (22) or *must be* is chosen instead of *is* in (23).

(22)   She *will* be one year old tomorrow. (Huddleston & Pullum 2002: 179)

(23)   If x is a prime number between 90 and 100 it *must* be 97 (Huddleston & Pullum 2002: 179)

(24)   And now I *can* see the Prime Minister, John Major. (Collins 2009: 104)

(25)   Dai had some quite interesting ideas which surprised me rather I *must* admit. (Coates 1983: 34)

Collins (2009) also uses this term to describe example (24) to describe *can* with

what Leech (1987) calls 'inert verbs of cognition and perception' (see Chapter 7). 'Low degree' modality also seems to apply to examples such as (25) – similar conventionalized uses of *must* are noted by Hunston (2000) – where the 'admitting' is carried out in uttering *I must admit*. In these cases, the role of modal forms to express 'speaker attitude' seems to extend to what Kjellmer (2003: 154) calls the 'formal concession to the feelings of the hearer by introducing an optional element'. That is, the use of a modal suggests there is more doubt or tentativeness than there actually is in interactional situations.

In summary, while definitions of modality may narrow or broaden its scope, there is a degree of consensus that modality relates to linguistic means speakers employ to express an attitude towards a particular state of affairs, often to avoid commitment as to whether it is or was actualized. This can be extended to include the views of others and attribution of claims to others as well as past forms. The categories of modality that are recognised in this study are obligation

2.3 Forms realising modal meaning

The discussion up to this point has focused on the definition of modality and the types of meanings that are considered to be modal. This section moves on to consider what forms have been linked to the expression of modal meaning. As mentioned at the beginning of Section 2.1, Stubbs (1986, 1996) has called for

'prolonged fieldwork' into modality in English, an in-depth study into the expression of modal meaning. The need for this fieldwork derives from the 'modal-centric' nature of much previous research; as Nuyts (2005) points out, most studies of modality have taken a form-to-function approach, starting with modal verbs (and a small set of related forms) and investigating what meanings they have. This formal tendency explains the prevalence of modal auxiliaries in the examples provided in Section 2.2. The result is that, beyond these forms, we have incomplete information regarding the 'variety of means' a speaker has 'for expressing similar modal notions' (Hoye, 1997: 52), in particular regarding their frequencies. This lack of information can be attributed to the fact that, while modal verbs are a relatively clear-cut formally distinct set, once one moves beyond this set to consider other realizations of modal meaning, a wide variety of forms may be implicated which are not as amenable to concise grammatical description, and are

2.3.1 Modal auxiliaries

While other means of expressing modal meaning are commonly acknowledged to exist, investigations of modality in English have typically concentrated on the central modal auxiliaries *will, would, can, could, may, might, shall, should* and *must* (Perkins 1983, Hoye 1997, Nuyts 2005 Gabrielatos 2010, Van linden & Verstraete 2011, Hunston 2011).

There are several reasons for this general tendency to focus on modal

verbs. Firstly, in formal/syntactic terms, modal verbs constitute a small, closed group, making research relatively manageable. Secondly, modal verbs are integrated into the verb phrase and the grammatical system, which, as Perkins (1983: 104) argues, means that they 'provide the least marked, and thus the most straightforward means of expressing modality that is available in English'. It is probably for this reason that modal verbs are commonly held to be the main way of expressing modality in English (Huddleston & Pullum 2002; Depraetere & Reed 2006); for Perkins (1983) and Hoye (1997), this explains the interest in modals at the expense of other forms, which are mainly used to provide paraphrases for modal meanings (Perkins 1983).

A third reason for the interest in modals is, as we have seen in Section 2.2, that they are able to express more than one type of modal meaning and therefore 'establish a formal tie between [modal] categories' (Van linden 2012: 12). This tie can be seen in examples such as (26) and (27), which Carter & McCarthy (2006: 639) provide to illustrate that 'the same modal form can be used with different meanings, depending on context'.

(26)   *I don't know. You **may** be right*

        (possibility: It is possible you are right.)

(27)   [spoken instruction to students taking a timed examination]

        *You **may** start now.*

        (permission: You are allowed to start now.)

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It is interesting to consider the way that Carter & McCarthy (2006) gloss and contextualise these examples from the point of view of Coates (1983) and Hunston (2000) that co-text is usually as powerful a disambiguator as context. The gloss provided for (26) makes no actual reference to 'context' (of situation) but is simply a gloss. However, certain features of the example not alluded to by Carter & McCarthy (2006) support their interpretation. We can note, for example, that the previous clause, *I don't know*, could lead to the expectation that a judgement of likelihood/certainty will follow; it is explicitly mentioned by Collins (2009: 93) as a 'harmonic' combination with epistemic *may*. Also the stative use of *be* following a modal like *may* is found by Coates (1983) to be strongly associated with this 'epistemic' reading. Example (27), was seen above in Section 2.2.3, where it was noted that the co-text here includes *now* as well as an agentive verb (*start*), both of which would tend to indicate non-epistemic meanings.

This is not to claim that it is possible to determine the meaning of every instance found, but to point out that the meanings of modal verbs are often closely associated with their co-text – the verbs and the subjects that they appear with, as Coates (1983) and Hunston (2000) have suggested.

A final potential reason why modals have attracted attention is that many of them are amongst the most frequent words in English. Figure 2.1 shows the frequencies of modal verbs (including contracted forms such as *can't* and *won't*) found by Collins (2009) in the three corpora he consulted (ICE-GB, ICE-AUS and

C-US); these have been normalised to hits per million words based on the data Collins provides. These are similar to the rankings and frequencies in Biber et al. (1999) although the ranking order *should, may, might* and *must*, shown here becomes *may*, *should, must, might* in Biber et al. (1999: 486). They do not give exact numbers but the normalised frequencies of *will*, *would* and *can* appear to be around 10% higher in Collins' corpora.
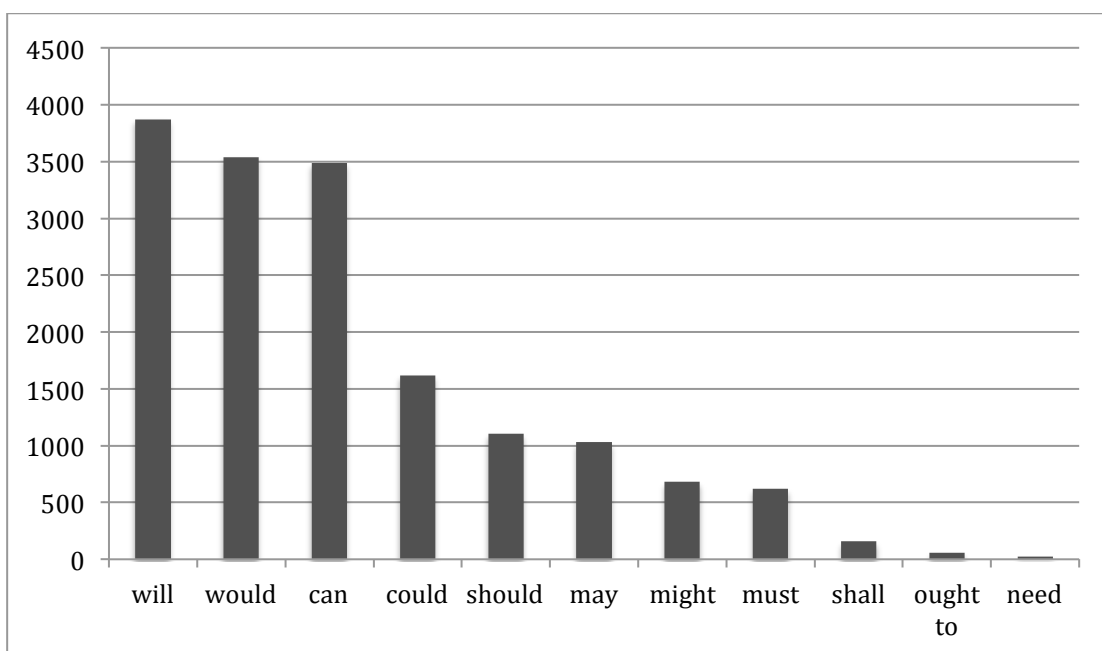
Figure 2.1. Normalised frequencies (per million words) of modals in Collins (2009)

2.3.2. Semi-modals

The form-to-function bias that Nuyts (2005) refers to can also explain the tendency of studies of modality in English to include reference to a range of linguistic forms which I shall for convenience label 'semi-modals' (see Table 2.2 for other terms). Semi-modals to a greater or lesser extent share the meanings and syntactic behaviour of modal verbs and are commonly treated as comparable forms. They are of interest firstly because they can be used in situations where they have very similar meanings to modal verbs, as illustrated by examples (28) and (29), taken from the sample analysed in this study. Although the forms used, *must* and *have to*, are different, their meaning in the two examples is arguably very similar, probably because in both cases there is a second person subject, and the verbs are also semantically related.

(28)   if you need to do a phonemic analysis you *must* decide which

sounds are in contrast

(29)   earlier in the chapter I referred to 'judicious' ignoring; you *have*

to judge when it is best to ignore certain childish actions.

Semi-modals have also attracted interest since they contrast with modal auxiliaries in that acting as apparently 'suppletive' forms for modal verbs with similar meanings by replacing them in syntactic contexts where they cannot occur (Coates

1983; Palmer 2003; Hoye 2005). An example of this suppletive function from the data examined in this study is BE *able to* in example (25). While *can* and BE *able to* both refer to possibility/ability, the lack of a non-finite form and inability to follow another modal verb (in standard English) means that *can* cannot occur in this sentence. In example (26), meanwhile, *had to* can be seen as providing an option for speakers to refer to past obligation – which is indicated by being associated with a *task* – which is not generally available with modals such as *must.*

(25)   Perhaps, after patient investigation, he would be able to match the handwriting. He should certainly *be able to* check whether or not the feather came from a swan.

(26)   In the other task, subjects *had to* judge whether or not a sentence followed appropriately from the preceding context.

Table 2.3 provides an overview of the forms which are included in various studies. The variety of forms across studies gives an indication of the extent to which semi-modals, compared to modal verbs are a more heterogeneous group without clear boundaries (Perkins 1983). One perspective on this heterogeneity is provided by Biber (2004: 108-9), who argues that four aspects tend to be taken into account when deciding what counts as a semi-modal: '(1) loss of inflection; (2) idiomatic

meaning; (3) phonological reduction; and (4) functional use to express modality'[1].

Thus, forms such as *got to* (or *gotta*) for Biber fit all the criteria, while others, such as BE *able to* may only conform to criterion (4). However, it is difficult to apply these criteria consistently in practice, which may account for the differences in the lists provided in Table 2.3.

If we consider the items listed in Biber et al. (1999: 484), for example, we can note that the criteria provided for classification as a 'marginal auxiliary' are purely formal ones; these items 'can behave like modals in taking auxiliary negation and *yes-no* question inversion'. However, one of the forms listed, NEED *to*, does not behave in this way ('modal' *need*, which is not followed by *to* does, however) and indeed, as Biber (2004) points out, NEED *to* only conforms to criterion (4). It can also be noted that *used to* does not meet Biber's (2004) criterion (4) since it does not express modal meaning, a reason Palmer (1990) provides for excluding it from consideration. Moving to 'semi-modals', Biber et al. (1999: 484) characterise those listed (see Table 2.3) as 'fixed idiomatic phrases with function similar to those of modals', noting that phonological reduction of three of these forms (*had better – better, have got to – gotta* and *be going to – gonna*) is often shown when writers try to represent spoken forms. This description suggests the forms listed fulfill almost all of Biber's (2004) criteria, but tends to ignore (1) in that (*had*) *better*, unlike the other forms, does not inflect (Mitchell 2003). We might also

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[1] It is interesting to note that Biber (2004) does not mention frequency as one of the criteria for deciding which 'semi-modals' are worthy of consideration

wonder why BE *to* is not included as a semi-modal in Biber et al. (1999) when it adheres to criteria (2) and (4)[1].

Table 2.3. Classes of semi-modals in the literature and realizations included

study	Terms		items included
Perkins (1983)	quasi-auxiliary modal expressions		*have (got) to, need to, had better*
Quirk et al. (1985)	marginal modal		*dare, need, ought to, used to*
	modal idioms		*had better, would rather/sooner, be to, have got to*
	semi auxiliaries		*have to, be about to, be able to, be bound to, be going to, be obliged to, be supposed to, be willing to*
Palmer (1990)	semi-modals		*would rather, had better, be bound to, be able to, have to/have got to, be going to*
Francis et al. (1996)	phrasal modals		*be able to, have got to, would rather, be unable to, had best, have to, would just as soon, used to, had better, be liable to, would sooner, would do well to, be bound to, be meant to, be supposed to, be going to, ought to, be sure to*
Biber et al. (1999)	marginal auxiliaries		*dare (to), need (to), ought to, used to*
	semi-modals		*(had) better, have to, (have) got to, be supposed to, be going to*
Collins (2009)	quasi-modals	semi-modals	*be to, had better, would rather, have got to*
		lexico-modals	*be able to, be about to, be bound to, be going to, be supposed to, have to, need to, want to*

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[1] This may be for the same reason that Millar (2009: 205) omits BE to, i.e. on the grounds that it is rather hard to isolate instances automatically in a corpus, 'due to its formal ambiguity'

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The point here is not to criticise Biber et al. (1999), who are in many ways consistent – particularly by excluding items that they consider compositional, such as BE *able to* – but to illustrate the difficulties involved in pinning down semi-modals from a grammatical perspective. It is also to show that, once one passes into the area of modal meaning expressed by such compositional items, lists of items become more arbitrary. As Biber (2004: 109) notes, given that many 'other forms … express modal-like meanings, it is reasonable to ask why forms like .. *be able to* have been privileged with semi-modal status in some previous accounts'. Leech et al. (2009: 96) also point out that the group is open and could include a 'considerable number of additional items'. Continuing with the example of BE *able to*[1], there are several other items with similar meanings which could be considered but are not, for example BE *capable of* and HAVE *the ability to*.

The issue of the delimitation of semi-modals assumes greater importance when we consider their frequencies, in particular in comparison with modal verbs with similar meanings. Figure 2.2 shows the frequencies Collins (2009) finds for the 'quasi-modals' he includes in his study. A comparison with Figure 2.1 shows that these forms are typically less frequent than modal verbs, a finding that is repeated across a range of studies including Biber et al. (1999), Leech (2003) and Millar (2009). However, corpus-based studies typically only consider a subset of the forms listed in Table 2.3; Collins's list is longer than the other studies just

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[1] whether or not BE *unable to* is treated as the 'same' item – Francis et al. 1996 treat it differently, while Palmer (1990) and Collins (2009) treat it as effectively the same

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mentioned. This is not to claim that semi-modals not included in Figure 2.2 are more frequent, but to draw attention to the restricted nature of the frequency information available.
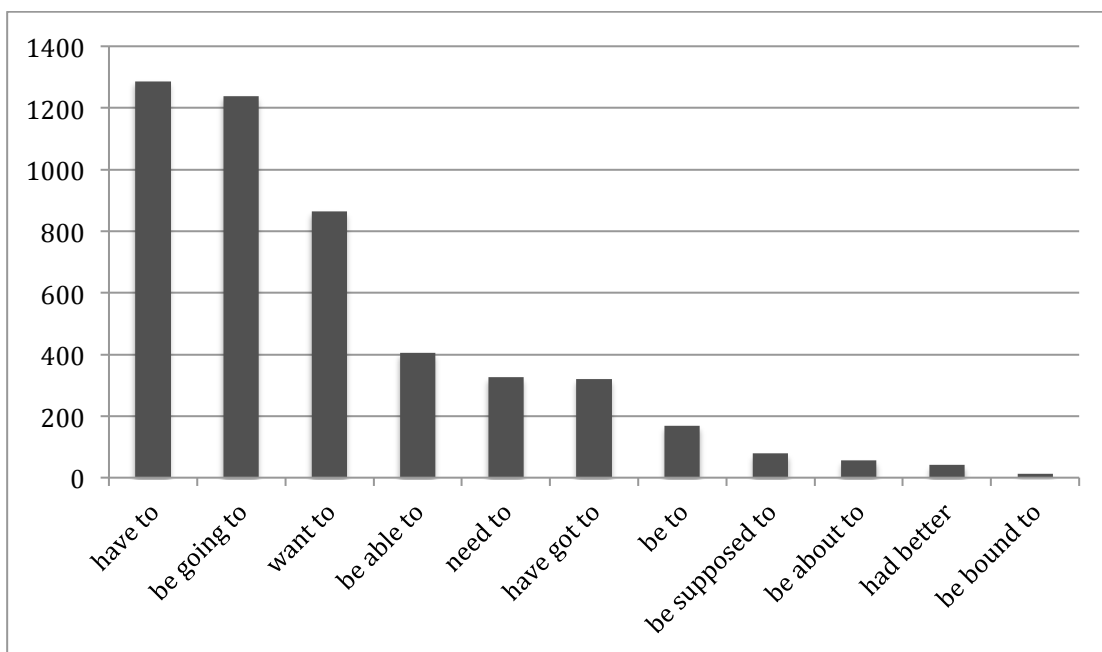
Figure 2.2. Normalised frequencies (pmw) of quasi-modals in Collins (2009: 5)

Thus, while certain semi-modals have been compared with modal verbs having similar meanings (e.g. *must* and HAVE *to*) in terms of their relative frequencies in corpora (e.g. Leech 2003, Smith 2003, Millar 2009, Close & Aarts 2010), this list is small, not including any forms beyond those listed in Table 2.3 For example, Biber et al. (1999) compare the frequencies of HAVE *to* and NEED *to* with those of *must* and *should* in the areas of obligation and extrinsic (epistemic) necessity. In the area of volition / prediction, they compare the frequencies of BE *going to* with *will*

and *would*. However, since (by their definition) there is no semi-modal of 'permission / possibility / ability', there is nothing to compare with *can*, *could*, *may* and *might*.

2.3.3 Other means of expressing modal meaning

Hoye (2005: 1496) points out that there has been a growing recognition of the need for studies of modality to take a wider view of the subject, moving beyond 'the verbal element or single/isolated modal expressions'. A number of studies have investigated individual expressions or groups of modal expressions (e.g. Krug 2000, Traugott 1997, Van linden & Verstraete 2011, Van linden 2012) and these will be referred to as necessary in the following chapters. Far fewer studies have considered the wider expression of modal meaning in English by investigating the range of linguistic means available, and these studies have not considered the extent to which these are actually used in discourse. In short, we are provided with typologies of forms which may then be related to particular modal meanings, but no frequencies.

It is interesting in this respect to consider the typologies presented by Perkins (1983), Huddleston & Pullum (2002) and Gabrielatos (2010) shown in Table 2.4. These studies differ in the amount of detail provided; in the case of Perkins (1983), only a small sample of the modal expressions he lists can be shown. Nevertheless, the realizations proposed in the three studies are

comparable, although there are a few noteworthy differences, such as the imperative, excluded by Perkins but included by both Huddleston & Pullum and Gabrielatos.

As Table 2.4 indicates, these three studies look at both lexical realizations according to whether verbs, nouns, adjectives (including participles in Perkins' case) or adverbs are involved, and also, in the 'Other' category, realizations which are related to clause or sentence level phenomena. The 'Other' category is interesting not only in terms of the level of agreement shown but in that these are phenomena often overlooked by studies of modal meaning.

In terms of verbs, nouns and adjectives, the three studies show different perspectives regarding the extent to which the modal meaning is attributable to the lexical item itself, its associated complementation pattern (almost all the items identified have *to*-infinitive and *that*-clause complements) or indeed specific phraseologies – Perkins refers to 'frames' and Gabrielatos to 'constructions'. While Huddleston & Pullum's analytic approach leads them to focus on isolated items and downplay complementation and phraseology, they do separately list subordination, which includes both *to-* and *that*-clauses, as strongly linked with modal meaning. Gabrielatos, meanwhile, mentions 'constructions' with these complementation patterns, without necessarily specifying the nouns or adjectives involved, or, in the case of nouns, the range of constructions he considers[1]. Perkins is explicit about

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[1] Gabrielatos (2007:2) also includes 'have an obligation to', presumably an example of the 'have + modal noun + to-infinitive' construction.

the association between modal meaning and *to-* and *that-*clause complementation. Furthermore, as the examples demonstrate, Perkins indicates that the modal meaning of nouns and adjectives/participles he identifies is dependent to some extent on their occurrence within the expressions he lists. This point is probably clearest with his category of 'adjectival and participial modal expressions', almost all of which are of the form BE + adjective/participle + *to / that.* Like Gabrielatos, Perkins is not committed to listing all of these expressions, or, in the case of 'nominal modal expressions' (Perkins 1983: 86-87), the 'frames' that might occur, confining himself in this respect 'largely to the occurrence of modal nouns in the frame 'there is a … TO/THAT''.

In terms of modal adverbs, the three studies provide lists of (varying lengths of) items; Perkins also discusses the various positions such adverbs can occur in the sentence.

Table 2.4 Realizations of modal meaning in Perkins (1983), Huddleston & Pullum (2002) and Gabrielatos (2010).

	Perkins (1983)	Huddleston & Pullum (2002)	Gabrielatos (2010)
Verbs	'modal lexical verbs' *assume, order, estimate, beg, advise, allow, promise, want, require*	[1] verbs *insist, permit, require*	Modal verb[3] + infinitive Modal verb[3] + *that*-clause • catenative verbs • mental state predicates
Nouns	'nominal modal expressions' ('there is a … to/that') *allegation, command, compulsion, assumption, ability, probability*	[1] nouns *possibility, permission*	Constructions involving modal nouns (e.g. *The possibility exists that...*)
Adjectives	'adjectival and participial modal expressions' *be going to, be sure to/that, be probable that, be compulsory to/that, be permissible to, be alleged to/that*	[1] adjectives *possible, necessary, likely, bound, supposed*	Constructions involving modal adjectives • BE + modal adjective + *that*-clause • BE + modal adjective + infinitive
Adverbs	modal adverbs *allegedly, apparently, arguably, certainly, conceivably* etc.	[1] adverbs *perhaps, possibly, necessarily, probably, certainly, surely*	Adverbs (e.g. *possibly, probably*)
Other	questions (past) tense IF-clauses	imperatives (polar) questions past tense other verb inflection (*were*) plain form of verb [2] the conditional	imperative past tense (+ perfect aspect) subjunctive protases

[1] these items are combined in the category of 'lexical modals' by Huddleston & Pullum
[2] this is an example of a broader category of 'subordination'
[3] this category includes 'any auxiliary or lexical verb with modal meaning' (Gabrielatos 2010: 148)

In short, the three studies in Table 2.4 raise a number of interconnected issues which this study seeks to address. First of all, they are not interested in phraseology *per se* and are consequently less than fully explicit regarding the extent to which phraseological information may play a part in modal meaning. However, the forms that they present suggest that certain complementation patterns – in particular *to*-infinitive and *that*-clauses – and 'frames' or 'constructions' are associated with modal meaning in conjunction with particular nouns, adjectives and verbs. This seems at least partly related to the basis on which the forms are identified. None of the studies in question gives information about how this was done, nor do they provide relative frequencies for different expressions or particular meanings. Therefore, we have information about a wide range of forms and their potential to realise modal meaning, but little idea about the extent to which they actually do realise modal meaning, or indeed about how they might be identified and distinguished.

A final issue that can be addressed immediately is the means of presentation: since the studies presented in Table 2.4 are in the first instance interested in the forms that realise modal meaning and secondly in the meanings they realise, it is hard to derive a picture of which forms might be associated with which meanings in more than a piecemeal fashion. The following section, therefore, summarises which forms these and other studies have proposed as associated with which particular meanings.

2.4 Modal meanings and their realisations: a synthesis

Section 2.2 gave an overview of different categorisations of modal meaning, concluding that it is possible to divide modal meanings into five main types: obligation, permission, volition, potential, and epistemic/evidential. Section 2.3 discussed the means available to express modal meaning, showing that, beyond modal verbs and semi-modals information is rather sketchy. However, since each study has its own aims and also its own means of organising the area of modal meaning, up to this point it has not been possible to show the realisations for each modal meaning that may be found. This section will therefore attempt a synthesis of the meanings and (in some cases rather tentative) potential realisations. The description of forms beyond modals and semi-modals attempts to indicate how they might be described from a lexical grammar perspective, that is by indicating how the structures involved, e.g. *it* BE Adj *to*, can include lexical or semantic content depending on the meaning involved using square brackets to denote lexical sets. Thus *it* BE Adj *to* expressing obligation becomes *it* BE [important] *to*, where [important] represents a range of adjectives with similar meanings to *important* when they occur in this pattern, such as *necessary, vital,* and *essential.*

2.4.1 Obligation: main meanings and forms

As we saw in Section 2.2.2, obligation is a notion that is referenced in all previous

studies of modality, whether or not it is seen as a separate notion from, on the one

hand 'dynamic' necessity or, on the other, from permission. The view that this

study takes is that distinctions between obligation and necessity[1] are not applicable

to a reliable degree (Collins 2009, Coates 1983, Biber et al. 1999, Smith 2003,

Lewis 2015). In contrast, the difference between permission and obligation is far

more clear-cut; the modal verbs involved are mainly separate (*must/should/ought*

for obligation, *can/could/may* for permission).

A number of different means of referring to obligation have been identified in

the literature. These are organised according to the typology proposed in Table 2.5

This is inspired by Halliday's (1994) orientations of obligation (see Table 2.2) but

expands on it to encompass forms he either does not consider or that he explicitly

excludes, such as imperatives, which are not 'discretionary' as they are direct

proposals (Halliday & Matthiessen 2004: 147). The distinctions between the types

are an attempt to take account of certain factors: the identity of the agent

responsible for carrying out the desired action, which is restricted in the case of

imperatives and 'implicit' with existential obligation; their role in the clause, whether

subject, as in most cases, or object in the case of X [ask] Y *to*; and whether the

purported 'source' of the obligation is identified.

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[1] at least as currently formulated in the literature

Table 2.5. Typology of expressions of 'obligation'

Type	Main forms
imperatives, imperative-likes	imperative, *let's* *Can/will you...?*
modals	*must, should*
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*
existential	*it* BE [important] *to* (*there* BE) *need* to
X ask Y to	X [ask] Y *to*
X BE asked to	X BE [asked] *to*
task BE to	*it* BE X's [task] *to*

A first means of expressing obligation is imperatives and what might be termed 'imperative-like' expressions. These share the feature that the range of addressees is restricted, either to second person or first and second person (*let's/let us*). Although imperatives are an important means of expressing obligation, being intimately bound up with the directive speech act (Lyons 1977, Huddleston & Pullum 2002), they are not generally included in the discussion of modal expressions and corpus-based studies of obligation (e.g. Smith 2003) have not counted them. Considering the range of uses of the imperative in discourse, which, as Huddleston & Pullum (2002: 929) note, is 'comparable to that of the deontic modals *must, should, may/can*', a modal interpretation of the imperative seems unproblematic (Gabrielatos 2010). Included with imperatives is *let's/let us* which is commonly counted as an imperative construction (Biber et al. 1999; Mindt 2000; Halliday & Matthiessen 2004). Other expressions with similar restrictions in terms of obliged party are also considered with imperatives, such as *you may/might want/wish to*, *would you mind...?*, or *can/will/would you...?*. These 'imperative-likes'

are not declarative modal verb clauses, but involve modal verbs combined with other forms (*may wish to*) or in interrogative constructions; they are conventionally associated with suggestions (*you may/might want/wish to*) and requests (interrogatives), respectively (Palmer 1990; Carter & McCarthy 2006, Adolphs 2008).

The modal auxiliaries and semi-modals of obligation have already been discussed to some extent in Section 2.2. Since, unlike imperatives, the 'full indicative person system' (Halliday & Matthiessen 2004: 148) is available, it is of interest to compare differences meaning associated with first, second and third person (Collins 2009, de Haan 2012). Obligation-related meanings are commonly noted also for second person *you will* (e.g. Coates 1983, Quirk et al. 1985, Carter & McCarthy 2006, Collins 2009) and *can/could* used in suggestions (Carter & McCarthy 2006).

'Existential' expressions of obligation have been given this label since they merely refer to the existence of an obligation without saying where it comes from or (usually) identifying the entity affected by the obligation. Halliday's term 'explicit objective', which covers approximately the same area of meaning is avoided due to the problematic nature of the term 'objective', which, as noted in Section 2.2.2, has two quite distinct meanings in the modality literature (Verstraete 2001 argues there are further meanings). Two types of existential expression of obligation are noted in the literature. The first of these is anticipatory *it* expressions (Hewings & Hewings 2002, Groom 2005, Hunston 2011), most commonly of the form *it* BE [important]

to/that. Several studies briefly mention BE *necessary to/that* (Perkins 1983, Biber 2004, Hunston 2008) without considering other adjectives that have similar meanings to *necessary*. Van linden & Verstraete (2011) and Van linden (2012), however, consider a range of 'deontic and evaluative' adjectives with *to-infinitive* and *that*-clause complementation, noting adjectives of different strengths including *necessary, crucial, vital, proper, essential, advisable, obligatory* and *compulsory*. They also discuss the difference between those that suggest a course of action for others, such as (27), and those that express 'the speaker's argumentative goals in building a text' (Van linden & Verstraete 2011: 159), here exemplified by (28).

> (27) OBVIOUSLY, when choosing a guitar, *it's important to* consider the
>   style of music you'll be playing. (Van linden & Verstraete 2011: 153)

> (28) Whatever the case, *it would be appropriate to* conclude this section of
>   our discussion with a closer clarification of the vernacular issue in
>   Christian missionary translation. (Van linden & Verstraete 2011: 159)

Although Van linden and Verstraete do not point this out, it seems relevant in terms of the functions they identify that, in (27) co-textual features include *obviously* and *you*, showing that this is addressed to an audience, while in (28) there is direct reference to *our discussion*.

Existential *there is a need to* as well as *the need to* are noted by Hunston (2011: 75) but generally not elsewhere. On the basis that, as with anticipatory *it*

expressions, other nouns with meanings of obligation (e.g. *duty, obligation*) may replace *need* here, it seems possible to propose the phraseology (*there* BE) [need] *to*. Frequency information regarding existential forms is generally lacking, in particular in comparison to modals and semi-modals of obligation. From the point of view of the expression of obligation they are interesting because, as noted by Hunston (2011) and Van linden & Verstraete (2011), in comparison to comparable uses of modal verbs, they are less direct and hence less potentially face-threatening (Brown & Levinson 1987). In other words, in appearing more like 'deontic statements', they allow the speaker to deny that any directive meaning was intended (Van linden & Verstraete 2011).

Another type of expression whose potential for expressing obligation is noted in the literature is here denoted as X [ask] Y *to*. Examples are provided by Halliday & Matthiessen (2004: 627), who note the relationship between *I urge you to vote* and *you must vote '*as explicit and implicit variants of … the type obligation', also giving examples including 'I want you to have…' and 'I would strongly advise you to pay a visit...'. The label reflects several distinct features. Firstly, that the verbs involved have the grammar pattern **V n to-inf** (Francis et al. 1996: 290), or 'Object + *to*-infinitive complementation' (Quirk et al. 1985: 1203-4). Secondly, the verb involved will have a meaning similar to "ask": other verbs noted include URGE, ADVISE, WANT (Halliday & Matthiessen 2004: 627), REQUIRE, OBLIGE (Quirk et al. 1985) and INVITE and ORDER (Perkins 1983). The third feature is that the subject (X) in such expressions identifies the 'obliger' or the source of the obligation, while the

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object (Y) is the entity obliged to carry out the action. There is little information in the literature about which of these verbs occurs most often with this meaning, although Biber et al. (1999) list REQUIRE as a frequently occurring verb of 'modality/causation'.

X BE [asked] *to* is effectively the passive of X [ask] Y *to*, and involves the same verbs. There is little about this type of expression in the literature except a list of verbs in Perkins (1983), although some exponents are sometimes mentioned as semi-modals, such as *be obliged to* (Quirk et al. 1985).

The final type of expression of obligation in Table 2.5 is X's [task] BE *to*. This type of expression and its relationship with obligation has been noted by Hunston (2008, 2011). It is different from expressions of existential obligation because the entity responsible for carrying out the 'task' (X) is identified. Hunston (2011) argues that the obligation meaning is linked to the meaning of the nouns (*task, role, responsibility, job*) but they seem to have this meaning in part due to the phrase they occur in. The noun *task* also may occur in different environments where it indicates difficulty rather than responsibility (e.g. *it would be an arduous task to*...).

2.4.2 Volition / purpose: main meanings and forms

As we saw in Section 2.2.4, while the area of volition (and related notions such as intention and purpose) is noted in many if not most studies of modality, there is less agreement about which 'supercategory' of modality it fits into, that is, whether

it is 'dynamic', 'intrinsic', 'root' or a type of 'modulation' (Halliday 1994). This study takes the view that exponents of volition and purpose, as distinct meanings, should be considered in their own right. As Givon (2001: 308) points out, 'intention, ability, preference, permission and obligation are all *future projecting*' (emphasis as in original) and therefore inherently uncertain. Saying that one wants or intends to do something gives no guarantee that it will be done and, by extension, saying that an action was intended avoids commitment as to whether it was in fact carried out or was successful. It also carries an element of attitude towards the carrying out of this action, that of its desirability (Gabrielatos 2010).

As with other types of modal meaning, most previous literature has focused on modal verbs and semi-modals, but a number of exponents of volition and purpose have been noted, for which there is rather more patchy information. Based on these, it is possible to propose a general categorisation of types of expressions of volition and purpose which can then be investigated. This categorisation is set out in Table 2.6. The first four rows divide exponents of volition and intention largely on formal lines, while the final two rows relate more to the expression of purpose, separated into lexical 'trying' and infinitival purpose clauses. Beyond the modal verbs (and semi-modal BE *going to*), which tend to commit the subject-referent to action, the other forms generally imply a lower level of commitment to carrying out the **V wh** action with the exception of 'trying' and 'purpose clauses' which instead refer to goal-directed activity whose result is not clear.

Table 2.6. Typology of expressions of volition and purpose

Type	Main forms
modals, semi-modals	*will, would, shall,* BE *going to*
be willing to	BE [willing] *to*
wanting	[want] *to*
aim be to	[aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose clause	*(in order) to* USE X *to*

The first type of exponent of volition is the modal verbs *will, would* and *shall* and the semi-modal BE *going to/gonna*, all of which are commonly associated with volition in the literature (e.g. Coates 1983; Quirk et al. 1985, Collins 2009). Since all of these forms may also express uncertainty, it is important to be able to distinguish between these meanings; the associations noted by Coates (1983) and listed in Section 2.2.4 are very useful here. These include the general association on the one hand between volition and agentive verbs, and, on the other, between uncertainty (epistemic meaning) and existential or inanimate subjects (*it, there*), stative verbs and passive voice.

The second type of expression of volition which has been noted in the literature is adjectival expressions (Perkins 1983, Huddleston & Pullum 2002), which usually occur in 'periphrastic expressions such as *be willing to*, and *be*

prepared to' (Collins 2009: 312). Halliday (1994: 89) mentions further examples such as *anxious to* and *determined to* which, together with *willing to* 'represent degrees of inclination'; they make explicit the range of meanings which are more implicit with modal verbs expressing volition. The subject-referent in such cases is invariably an animate being (Perkins 1983). Putting this information together suggests the phraseology X BE [willing] *to,* where X is an animate entity and there is an adjective with a meaning similar to *willing*. This phraseology is clearly related to the grammar pattern **Adj to-inf** in Francis et al. (1998), which lists a range of adjectives in the 'unwilling' and 'willing' meaning groups, such as *reluctant, hesitant, eager, interested* and *prepared*. However, there is little or no information in the literature about which adjectives occur most frequently or indeed the frequency of the phraseology as a whole.

In terms of verbs that are related to volition, WANT is most often mentioned in particular with *to*-infinitive complementation. Krug (2000) includes WANT as an 'emerging English modal' and Collins (2009) lists it as a semi-modal – it is in fact the third most frequent semi-modal in his study (see Figure 2.2). Although WANT is only one of a number of verbs with *to*-infinitive complementation which have similar future projecting meanings (Fries 1927) – Francis et al. (1996) include AIM, EXPECT, FEAR and SEEK in their 'hope' meaning group and AGREE, CHOOSE, DECIDE, OFFER, PLAN and PROMISE in the 'promise' meaning group of the **V to-inf** pattern – these other verbs have received little attention in the modality literature. Perkins (1983) mentions several of these verbs and Traugott (1997) considers THREATEN and

PROMISE as potential 'quasi-modals' but neither study makes reference to their frequencies or phraseological associations. There are thus two important phraseological aspects of this group of verbs: the 'volition' meaning and the infinitival complement.

Although studies commonly refer to modal meanings of intention, the noun *intention* is rarely considered in terms of its potential to express modal meaning; where 'modal nouns' are mentioned, as in Perkins (1983), Huddleston & Pullum (2002) and Gabrielatos (2010) these tend to be those that are related to obligation, possibility and permission (see Table 2.4) rather than volition. However, Hunston (2011) notes the volition meaning of a group of related nouns – *aim, purpose, intention, objective* and *goal* – which are all found to co-occur with *of preserving*, suggesting the phraseology *the* [aim] *of –ing*. However, this is not the only pattern these nouns occur in; they are also grouped in the 'aim' meaning groups of the related patterns **the N be to-inf** (i.e. *the aim is to ...*) and **poss N *be* to-inf** (i.e. *our aim is to...*) in Francis et al. (1998: 244), which are here combined in the phraseology [aim] BE *to.* Since studies do not commonly reference these nouns, we have little idea about which ones occur in which patterns most frequently.

The examples of volition/intention presented so far tend to focus on the aims of, or commitments to, future action. However, as Hunston (2008; 2011) has pointed out, there is a range of expressions related to volition/intention – including BE *used to*, ATTEMPT *to* (noun and verb), TRY *to* and (*in order*) *to* – which refer to purpose and which 'could be considered close to Halliday's notion of 'inclination''

(Hunston 2011: 76)*. One important difference between instances involving these items and those mentioned so far under 'volition' is that they not only express volition/intention but also implicate some kind of action. The modal meaning of TRY *to* and associated forms such as ATTEMPT is not widely recognised and even where it is, only mentioned in passing (e.g. Krug 2000; Bybee et al. 1994). It is based on the 'forward projecting' feature common to volition expressions; at the time of the attempt there is no commitment as to whether it is or is not successful which, as Givon (2001) notes, adds an element of uncertainty. If we consider one example from the sample considered in this study (29), we can see firstly that the addition of *trying to* in this sentence does not tell us whether the detectives were successful, but it also adds an element of speaker attitude in that the detectives are shown as wanting to discover this information and making an effort to do so. In fact, a number of volition expressions could be substituted for *trying to* here, including *wanting to, who wanted to* or *who were keen to*. It is therefore of interest to investigate to what extent 'trying' expressions occur and which verbs are associated with them.

(29) Mr Tree was quizzed by detectives *trying to discover how* much of

the drug she had taken.

Apart from 'trying' expressions, Hunston (2011) notes BE *used to* and *in order to*, both of which introduce a purpose clause like the one seen in (30). Biber et al.

(1999) also note the close association between such *to*-clauses and the expression of purpose.

(30) *In order to* establish whether an agreement is registrable, the
        following steps should be followed:

This type of clause complex is glossed by Winter (1992: 164) as a *purpose - achievement of purpose* clause relation and is described within Rhetorical Structure Theory by Mann & Thompson (1988) and Mann et al. (1992) as the 'purpose' relation. This relation consists of two parts, the 'overall objective', realised by the purpose clause, and the 'preliminary step', the action taken to achieve the objective. It is notable that in their description of this relation, Mann & Thompson (1988: 277) state that the purpose clause 'presents a situation that is unrealized', a description that is compatible with the reading of these clauses as associated with modal meaning; Givon (2001) also includes purpose clauses amongst those with 'irrealis scope'.

2.4.3 Potential: main meanings and forms

Section 2.2.3 showed how ability and possibility are commonly associated in studies of modality and how previous attempts to distinguish them on the basis of source ('inherent source' = ability; 'external source' = possibility) have found

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considerable difficulty. For this reason, they are considered together in this study, a position that finds support in Gabrielatos (2010: 140); his category of *attitude to propensity* (PP) includes expressions referring to 'abilities, skills, qualities, aptitude, feasibility or propensity'.

As indicated in Table 2.7, it is possible to devise a relatively concise typology of expressions of potential. This categorisation takes inspiration from Halliday's (1994) 'orientations', already seen for 'obligation' (see Table 2.2)[1], in that modal verbs are implicit/subjective, able/ability type expressions are implicit/objective, existential expressions relate to the explicit/objective category in and enabling expressions are similar to the explicit/subjective category.

Table 2.7. Typology of expressions of potential

type	main forms
modal	*can, could, may*
able/ability	X BE [able] *to* X HAVE [ability] *to*
existential	*it* BE [difficult] *to* [way] *to / of*
enabling	X [enable] Y (*to*)

The modal verbs of potential, *can, could* and *may*, have already received some attention in Section 2.2.3. They are all noted to be polysemous, although Coates

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[1] Although Halliday's model of modality struggles to accommodate ability / potentiality, placing it on the 'fringe of the modality system' (Halliday & Matthiessen 2004: 621) as it does not fit into his conception of modality, which revolves around 'proposals' and 'propositions'

(1983) provides indications of how the senses may be distinguished, by considering subject types (animate/inanimate) and meanings of main verbs (stative/agentive). Other explicit co-textual indicators such as reference to a law or an enabling factor will also be of help.

As noted in Section 2.3.2, BE *(un)able to* has often been singled out for attention as a semi-modal, but there are other ways of referring to the potential of the subject referent such as BE *capable of* or *good at* (Hunston 2011: 77) which have received little attention in the modality literature. A related way of referring to potential is HAVE *the ability to*; this is sometimes as a means of paraphrasing the meaning of *can* (e.g. Quirk et al. 1985), but it is not generally considered as an expression of modal meaning in its own right, nor are other nouns of potential such as *opportunity*, which may be used to specify the kind of potential in question.

Existential expressions of potential allow speakers to avoid direct reference to the entity whose potential is estimated and instead merely claim that a potential exists or does not exist. Perkins (1983) notes the anticipatory *it* expression *it* BE *(im)possible to*, which is often used as a paraphrase to illustrate the meanings of *can* and *could* but is not generally listed as a modal expression in its own right. Hunston (2011: 75) notes the related adjectives *difficult, hard* and *easy* and glosses them as referring to 'degree of difficulty'; these can be combined in the phraseology *it* BE [difficult] *to*, which provides a range of meanings between *can* and *can't.* We can also note further ways of referring to potential without necessarily specifying whose potential; [way] *to/of* is just one of a set of similar

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nouns such as *means, method, basis, criterion* and *rules* (Hunston 2011: 77) which may refer to potential. Similarly, *difficulty* is a member of a group which includes items such as *problem(s)* and *task* (ibid.).

The final main type of modal expression of potential which has been noted is 'enabling' expressions. While there is passing reference to the modal meaning of ENABLE and ALLOW as exponents of the pattern **V n to-inf** (Francis et al. 1996) in Hunston (2011) and Quirk et al. (1985), these expressions are largely ignored in the modality literature. What distinguishes 'enabling' from other realizations of potential is that it brings to prominence the enabling factor by making it the subject of the modal expression X [enable] Y (*to*). This option is not available with the other means of expressing potential, where enabling/preventing circumstances are generally referred to in optional elements of the sentence such as prepositional phrases.

2.4.4 Uncertainty: main meanings and forms

This is an area of modal meaning which is generally discussed in the modality literature under the heading of epistemic modality, although Halliday (1994) and Gabrielatos (2010) prefer the terms 'probability' and 'attitude to likelihood', respectively. Whichever term is used, there is a broad agreement regarding the types of meaning involved; Gabrielatos (2010: 139) summmarises these as 'assessments of actuality, factuality, truth, knowledge, belief, possibility, likelihood

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or probability.' The related area of evidential modality, which relates to the source of information and therefore usually to the amount of confidence one might have, tends (usually implicitly) to be included as part of epistemic meaning in studies of modality in English (Nuyts 2001b). This is because – unlike in the languages where it was originally noted, such as Turkish (Lyons 1977) – there is no formal requirement in English to indicate (e.g. by using verbal inflection) whence one's information derives. In this study clear instances of evidential modality will be discussed where they occur. The label 'uncertainty' is preferred to others previously suggested since 'probability' and 'likelihood' are too narrow and 'epistemic' suggests notions of possibility and necessity which are not always relevant to the meanings involved here.

As with the other types of modal meaning discussed in this study, most studies focus on the use of modal verbs to express different levels of confidence or likelihood, although other ways of expressing this type of meaning are noted in the literature; they are shown in Table 2.8.

Table 2.8. Typology of expressions of uncertainty

Type	Main forms
modals, semi-modals	*will, would, may, might, must, be going to*
adverbs	*probably, perhaps*
that-projection	[think] that [say] that
conditional	*if, unless*
***yes-no* question**	*Have you …?*

Modal verbs are invariably associated with the expression of uncertainty, likelihood inference and probability in the literature. In most cases, these refer to the speaker's assessment of varying levels of likelihood as well as hypothetical and counter-factual instances. Modals are also commonly noted to combine with other 'harmonic' expressions of uncertainty such as modal adverbs and expressions like *I think/suppose* (Lyons 1977, Coates 1983, Hoye 1997, Collins 2009).

A range of adverbs are noted to express different levels of probability and certainty from *probably* and *perhaps* to *certainly* (Perkins 1983, Huddleston & Pullum 2002; see Table 2.4). Hoye (1997) also notes 'evidential' adverbs that indicate that the assessment is based on evidence of some kind: *apparently, clearly, evidently* and *obviously*.

Mental predicates introducing subordinate *that*-clauses are commonly noted (e.g. Perkins 1983; Halliday 1994, Aijmer 2002, Huddleston & Pullum 2002, Carter

& McCarthy 2006, de Haan 2006) as a means of qualifying commitment or expressing different degrees of certainty, from BE *sure that* through EXPECT *that* to GUESS *that*. As the verb THINK is most commonly noted, it is used to represent this group in Table 2.8: [think] *that*. With verbs or adjectives introducing *that*-clauses, the entity whose judgement is at stake is identified, which is why Halliday (1994) refers to such instances as 'explicit', in contrast to the 'implicit' judgement made using a modal verb. Stubbs (1986, 1996) also notes reporting structures as a type of evidential expression, which is why [say] *that* is included.

As Gabrielatos (2010: 124) points out, the *if*-clause (or *protasis*), or the subordinate clause of what is traditionally (e.g. Palmer 1990) called a 'conditional sentence', is commonly associated with the expression of modal meaning (Perkins 1983, Palmer 1990, Bybee et al. 1994). Since most studies of modality focus mainly on modal auxiliaries, the place of *if*-clauses in categorisations of modal meaning is not generally considered. However, since it is widely agreed that *if*-clauses are associated with hypotheticality and uncertainty (Perkins 1983; Quirk et al 1985; Palmer 1990; Gabrielatos 2010), they most clearly belong in this current category. As is commonly noted (Perkins 1983, Leech 1987; Quirk et al 1985), there are several ways of introducing *if*-clauses, including *if, unless,* and *in case*.

A further means of expressing uncertainty that can be considered is *yes-no* questions. Like *if*-clauses, the association between questions, and in particular *yes-no* questions, and modal meaning is widely noted (Lyons 1977, Perkins 1983, Quirk et al. 1985, Chafe 1995, Huddleston & Pullum 2002, Gabrielatos 2010) since

they are an 'expression of a speaker's ignorance or doubt' (Perkins 1983: 111). The fact that, with this type of question 'the speaker will usually regard both positive and negative answers as possibly true' (Huddleston & Pullum 2002: 174), draws attention to the similarity between them and the characterisation of modality as 'the region of uncertainty that lies between 'yes' and 'no'' (Halliday & Matthiessen 2004: 147).

The means of expressing uncertainty mentioned so far and listed in Table 2.8 do not cover all possibilities; it is very possible that other ways will be found. An example mentioned in a number of studies is 'catenative' SEEM and APPEAR *to* (Quirk et al. 1985, Carter & McCarthy 2006, Gabrielatos 2010). Carter & McCarthy (2006: 401) argue that *you appear to be* might be paraphrased using an adverb as *you are probably*, but we could note that reference to appearance (evidentiality) seems different from reference to probability.

2.5 Investigating modal meaning

The survey of forms that have been associated with particular modal meanings in the literature presented in Section 2.4 indicates how these might be described from a lexical grammar perspective to integrate grammatical and lexical information. However, it does not indicate how they might be investigated, one of the issues mentioned with regard to Perkins (1983), Huddleston & Pullum (2002) and Gabrielatos (2010). What is needed, then is an approach that is consistent with the

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aims of lexical grammar, that is, that can be used to see which modal meanings and exponents are associated with which lexical items.

The work of Hunston (2003, 2006, 2008, 2011) suggests just such an approach. This focuses on means of identifying 'modal-like expressions', or realizations of modal meaning other than modal verbs, demonstrating that certain 'verbs act as 'attractors' of modal meaning' (Hunston 2011: 66) through analysis of frequently co-occurring items (collocates[1]) and their concordance lines in a corpus. The starting point for this research is the observation that certain verbs have apparently imbalanced distributions of forms in a corpus, in particular high proportions of base (uninflected) forms. Taking the example of *distinguish*, Hunston (2011) notes that its most frequent collocate immediately to the left (L1) is *to* (60% of all instances); amongst the next 14 most frequently occurring words in L1 position are the modal verbs *can, could, must, will* and *should*. An examination of the left collocates of *to distinguish* shows that the most frequent items include *difficult, able, hard, important, unable, impossible, need, easy, ability, how, used, have, possible* (Hunston 2011: 74). After investigating the concordance lines for these items, considering them 'in terms of the sequence each word is part of, the grammar patterns these sequences realise ... and the meanings expressed' (ibid.) Hunston identifies a range of 'modal-like expressions', some of which are shown in Table 2.9.

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[1] It should be noted out that Hunston does not in these studies tend to use statistical measures for identifying collocates, relying instead on raw frequency or percentage measures

Table 2.9. First 4 rows of Hunston's (2011: 75) Table of Sequences, Patterns and Meanings with *to distinguish*

Sequence	Grammar pattern	Meaning
it is difficult to distinguish *it is hard to distinguish* *it is (not) easy to distinguish* *it is impossible to distinguish*	*it be* + adjective + to-infinitive	degree of difficulty
x is easy to distinguish from y *x is difficult to distinguish from y* *x is hard to distinguish from y*	link verb + adjective + to-infinitive	degree of difficulty
be able to distinguish *be unable to distinguish*	link verb + adjective + to-infinitive	ability
it's important to distinguish	*it be* + adjective + to-infinitive	necessity

Hunston's point here is not to provide a comprehensive list of realizations of modal meaning, and the meanings suggested are themselves tentative. Instead, this procedure indicates how modal expressions might be investigated, that is by starting with an 'attractor' of modal meaning and finding what is attracted to it.

There are thus two main implications of Hunston's work on modal expressions. The first one of these is that certain forms (e.g. *distinguish*) act as attractors of modal meaning and their investigation in a corpus can therefore be used to ascertain which modal expressions occur, which modal meanings they express and how frequently they are found. The second is that the modal expressions thus identified may be amenable to a phraseological description based on a long line of work including Sinclair & Renouf (1991), Francis (1993), Francis et al. (1996) and Francis et al. (1998) and outlined in Section 2.4. A potential

candidate for this investigation is verbs with *wh*-clause complementation (the **V wh** pattern), which Hunston (2003, 2008, 2011) has proposed as an 'attractor' of modal meanings on the basis of uneven distributions of the forms of verbs such as DECIDE when followed by *wh*-clauses.

2.6 The V wh pattern

Hunston suggests certain verbs or patterns act as 'attractors' of modal meaning and that one candidate is the **V wh** pattern, or verbs with *wh*-clause complementation. It is first important to consider why verbs with *wh*-clause complementation might attract modal meaning and what features of the **V wh** pattern are relevant to this study. This means first looking at the ways that **V wh** and similar phenomena have been dealt with in the literature.

An important initial point is that the term *wh*-clause as used in this study is not the same as that in Biber et al. (1999), who include all clauses starting with a *wh*-word. An example of a clause starting with a *wh*-word which is not of interest here is provided in (31). This is what Biber et al. (1999) and Quirk et al. (1985) refer to as a 'nominal relative clause', which can occur 'with almost any transitive verb' (Biber et al. 1999: 687). In contrast, (32) includes an example of a *wh*-interrogative clause since it reports a question; this type of clause only occurs with a fairly restricted set of verbs.

(31)   Look *what I've done*   (Biber et al. 1999: 688)

(32)   She asked me *who would look after the baby.*   (Quirk et al.

1985: 1051)

Quirk et al. (1985: 1184) note further that many verbs have *wh*-interrogative complementation mainly when they are in a 'nonassertive context', that is, when 'the superordinate clause is interrogative or negative'. They account for this relationship by noting that 'the *wh*-interrogative clause … generally implies lack of knowledge on the part of the speaker'. From the point of view of this study, it is interesting to note that, although no explicit reference is made to modal meaning and its relation to 'nonassertive contexts', of the three examples Quirk et al. provide, (5) involves the modal expression X [ask] Y *to* and (6) a modal verb.

(5)   I *asked her to confirm* whether the flight had been booked.

(6)   *Can you confirm* which flight we are taking?

Quirk et al. (1985: 1184) also point out that 'some verbs which themselves express uncertainty, such as *ask* and *wonder*' are therefore are not liable to this 'nonassertive constraint'. These latter verbs are termed 'question-oriented' by Ohlander (1986) while those that tend to non-assertive contexts are 'answer-oriented', terms which are used in a similar way by Trotta (2000) and Huddleston & Pullum (2002). This contrast between question- and answer-orientation is of

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particular interest to this study because of the ways that these studies show how 'answer-oriented words' can become question-oriented. As Trotta (2000: 39) observes:

> both *I knew what he did* and *I found out what he did* are answer-oriented,
>
> but the predication can be changed to question-orientation, *eg I don't know*
>
> *what he did, Do you know what he did?; I tried to find out what he did,*
>
> *Please find out what he did!*

As we can see, the means of changing one orientation to another, like Quirk et al.'s (1985) 'non-assertive contexts' involve not just a change of polarity (*I knew – I don't know*) but also forms that are associated with modal meaning: polar interrogatives (*yes-no* questions), TRY *to* and the imperative *find out*. While Hunston (2003, 2008, 2011) makes no reference to these observations regarding question- and answer-orientation, they have implications for the proposal of the association between the **V wh** pattern and modal meaning. First of all, this association is to some extent suggested by previous (non corpus-based) work, and, secondly, it is likely that the strength of the association will vary according to the meaning of the **V wh** verb concerned. This is where questions of the range of verbs involved and their meanings become important.

*2.6.1 Meanings of **V wh** verbs*

While Quirk et al. (1985) provide a list of verbs with *wh*-interrogative complementation, other studies have shown how these verbs can be divided into groups according to perceived commonalities of meaning. Table 2.10 shows some of these classifications, indicating the general agreement across these studies that verbs with *wh*-clause complementation express notions such as *communicating, thinking, discovering,* and *knowing.*

There are several differences across the studies listed in Table 2.10. The most obvious is that certain verbs receive different categorisations; for example INVESTIGATE is classed as an 'inquisitive verb' by Karttunen (1977) but in the 'discover' meaning group by Francis et al. (1996). Hunston & Francis (2000: 86) account for such differences by observing that 'the verbs in [meaning] groups are not synonyms of each other, but simply share an aspect of meaning, and different observers would prioritise different aspects.' While this may be true, unfortunately, none of the studies in Table 2.10 discuss the reasons underlying their categorisations.

Table 2.10. Semantic sets of **V wh** verbs in the literature

study	meaning groups	example verbs
Karttunen (1977)	verbs of communication inquisitive verbs verbs of conjecture verbs of retaining knowledge verbs of acquiring knowledge decision verbs verbs of relevance verbs of dependancy [sic]	*tell, show, indicate* *ask, wonder, investigate* *guess, predict* *know, remember, forget* *learn, notice, find out, discover* *decide, determine, specify* *matter, care* *depend on, be related to*
Francis et al. (1996): V wh pattern	'ASK' 'THINK' 'DISCOVER' 'SHOW' 'DETERMINE'	*describe, explain, say* *appreciate, consider, forget, know* *ascertain, guess, investigate* *demonstrate, indicate, reveal* *decide, determine*
Francis et al. (1996): V wh-to-inf pattern	'DESCRIBE' 'DISCOVER' 'DECIDE' 'REMEMBER'	*demonstrate, explain, indicate, say* *ask, check, determine, see* *consider, decide, imagine, judge* *forget, know, realize, see*
Biber et al. (1999)	Speech act verbs Other communication verbs Cognition verbs Perception verbs Attitude / emotion verbs	*ask, discuss, explain, question, say* *show, describe, indicate, reveal* *know, remember, wonder, ascertain* *see, hear, notice* *care*
Trotta (2000)	Communication Inquiry Knowledge/Cognition Recollection Judgment Doubt/Certainty Perception/Reflection Concern	*demonstrate, describe, explain, say* *ask, investigate, question* *discover, figure out, find out, know* *forget, remember* *decide, determine, guess* *doubt* *consider, hear, imagine, see, wonder* *care*
Huddleston & Pullum (2002)	Telling Asking Guessing Knowing Deciding Disbelief Significance Dependence	*tell, show* *ask, wonder, investigate* *guess, predict, judge* *know, find out, remember, discover* *decide, determine* *question* *matter, care* *depend on*

A further difference between the studies listed in Table 2.10 is that, while Karttunen

(1977), Trotta (2000) and Huddleston & Pullum (2002) only list verbs in one meaning, Francis et al. (1996) attempts to account for the polysemy of the verbs concerned. For example, SEE is listed in four different meaning groups ('ASK', 'THINK', 'DISCOVER' and 'VERBS WITH OTHER MEANINGS') on the basis of different senses listed in the CCED.

The final difference between these studies is the types of *wh*-clause that are included. As can be seen, Francis et al. (1996) present two categorisations of verbs which have formally distinct patterns, **V wh** and **V wh-to-inf** (these are not treated separately in this study). The other studies implicitly include both of these without necessarily distinguishing between them. What is not evident from the classification, however, is that the examples in Francis et al. (1996) show that they include embedded exclamative clauses; other studies tend to treat these clauses separately. Since this may have an effect on the classifications provided, it is important to clarify the types of *wh*-clause that can be recognised.

2.6.2 Types of wh-clause

As indicated in Table 2.11, this study recognises two main types of *wh*-clauses, 'genuine' and 'special', which are then subdivided into more specific types. It is important to mention at the outset that these types of *wh*-clause do not generally have an existence independent of their governing expressions; examples taken out of their co-text may be ambiguous. The distinction between 'genuine' and 'special' relates to the attitude of the discourse participants (usually either the speaker or

the subject referent) to the information in question. With 'genuine' types this information is lacking in some way, while with 'special' clauses either the information is not really missing or some kind of attitude is expressed towards it.

Table 2.11. Types of *wh*-clause recognised in this study

'genuine' *wh*-clause	'special' *wh*-clauses
information *wh*-clause	rhetorical/biased *wh*-clause
direction *wh*-clause	*wh*-exclamative
	declarative *how*

Information wh-clause

The term 'information *wh*-clause' is taken from Huddleston & Pullum (2002) and is essentially the same as *wh*-interrogative in Quirk et al. (1985). The interpretation of a *wh*-clause as realising an (embedded) information question is based on the understanding that it 'contains a gap of unknown information, expressed by the wh-element' (Quirk et al. 1985: 1060). This 'gap' is what makes such *wh*-clauses 'genuine', in contrast to the 'special' ones presented below.

Some examples from the sample are provided in Figure 2.3; these include 'variable' *wh*-clauses (lines 1-3), 'alternative' *wh*-clauses, that is, those involving *whether/if ... or ...* (line 4) and 'polar' *whether/if*-clauses (line 5). In each case, the answer to the question is unknown to some participant in the discourse, whether the reader (lines 1 and 2), the subject of the sentence (lines 3 and 4) or (implicitly)

the speaker (line 5).

1	Schneider (1974)	explains how	male silk moth pheromones are received
2	I want in this book to	discuss what	is involved in giving RE the positive and creative image which it should have
3	A novelist from Ghana stood up and demanded to	know why	Surkov had used the expression 'black and white'.
4	The court must	find out whether	the payment stipulated is in truth a penalty **or** liquidated damages.
5	It is difficult to	judge if	the Air Force and NASA got good value for the $1,700 million they spent – $13.17 million per flight.

Figure 2.3. Examples of information *wh*-clauses in the data analysed in this study

Direction wh-clauses

The distinction between 'information' questions and 'direction' questions made by Huddleston & Pullum (2002) is related to the formal distinction between the **V wh** and **V wh-to-inf** patterns in Francis et al. (1996). However, it is not intended to be a formal distinction but a semantic one; Huddleston & Pullum (2002: 877) characterise direction questions as those whose 'answers characteristically have the force of directives. They seek not information but direction'. They are still 'genuine' *wh*-clauses, since the answer is unknown.

 This type of question typically expresses advice, instruction or obligation to perform an action, involving 'a judgement as to what course of action is in the best interests of the one uttering the question' (Huddleston & Pullum 2002: 879). The analysis of concordance lines of **V wh** instances shows that 'direction' *wh*-clauses are not limited to infinitival *wh*-clauses. Example (13) shows a non-infinitival

'direction' *wh*-clause. The presence of a modal verb or other marker of obligation (items in italics) in the *wh*-clause may indicate a 'direction' *wh*-clause.

(13) Instead, there would be a set of lexical rules **indicating which** affix *had to* be added to produce each inflected form.

As with other *wh*-clause types, direction *wh*-clauses are associated with particular verbs; Francis et al. (1996) indicate this (see Table 2.10), although their distinction is a purely formal one (**V wh** vs. **V wh-to-inf**).

Exclamatives

While information and direction *wh*-clauses implicitly pose a 'genuine' question, leaving 'a gap of unknown information, expressed by the wh-element' (Quirk et al. 1985: 1060), this is not really the case with *wh*-exclamatives (Huddleston 1993); they are the first type of 'special' *wh*-clause. Their function instead is to 'express the speaker's strong emotional reaction of attitude to some situation' (Huddleston & Pullum 2002: 922), that is, the situation presented in the *wh*-clause is pre-supposed. Examples (3) and (4) are *wh*-exclamatives from the sample analysed in this study. They show the two main exponents, *how* followed by an adjective or adverb and *what (a)* followed by a noun. In (3), the attitude towards the *wh*-clause element is that it *is* lucrative and therefore positive. This is not implicitly a question, and nor is (4), the *wh*-element of which cannot even be paraphrased as a question.

It is noticeable that, in both cases the controlling verb (*discovered*, *demonstrate*) is in an answer-oriented environment, a point that Trotta (2000) makes more generally for *wh*-exclamatives.

(3) Over the last thirty years advertising […] has discovered *how lucrative* it can be to add a "new dimension" to the service it offers to clients.

(4) The Kiwis are starting to demonstrate *what a fine squad of players* they have.

These differences from *wh*-interrogatives lead Quirk et al. (1985), Huddleston & Pullum (2002) and Trotta (2000) separate *wh*-exclamatives out for the purposes of discussion. However, these studies also point out the formal similarities between *wh*-exclamatives and *wh*-interrogatives which can result in ambiguity in some instances 'if the superordinate clause has a predication appropriate for both types of clauses' (Quirk et al. 1985: 1055). Example (3) is such a case: the more salient reading is exclamative (i.e. it is very lucrative), but an interrogative reading could be argued (i.e. there is some specific amount of money which is in question and advertising has discovered it). Another similarity between *wh*-interrogatives and *wh*-exclamatives is that all verbs that have *wh*-exclamative complementation also have *wh*-interrogative complements, although as Trotta (2000) observes, the group of verbs with *wh*-exclamative complementation is somewhat smaller.

Declarative how

The second type of 'special' *wh*-clause is 'declarative *how*' (Huddleston & Pullum 2002). These are formally similar to *wh*-interrogatives, but differ semantically in that the information that would make them a question is not missing. Examples such as (17) provide specific information and are thus similar in function to *that*-clauses (Huddleston & Pullum 2002). It can be seen that no question is involved here from the fact that it would make little sense to ask 'how will Dawn be fully conscious throughout the operation?'.

(17) they knew enough about Dawn's condition to question the neurosurgeon closely when he **described how** Dawn would be fully conscious throughout the operation so that he could identify the damaged brain cells

(19) the three men now at liberty talk at length – for the first time since their release – and **reveal how** they were beaten into signing confessions.

Huddleston & Pullum (2002: 954), who coin the term 'declarative *how*' is one of very few studies to mention this phenomenon, associating it with 'very informal style'. *How*-clauses sometimes have both a 'declarative' and a 'question' reading. In (19), the declarative *how* interpretation applies if *they were beaten into signing their confesssions* is seen as comprising all the information that will be provided (in

this case *that* would be substitutable for *how* with this verb). However, it may be that some description of the beating and how it led to their confessions will be provided, in which case a 'genuine' question reading of the clause is also possible.

The significance of the recognition of declarative *how* clauses is that this reading is partly dependent on the 'declarative', or answer-oriented nature of the verb; in these examples the description or revealing has already happened. Thus, a declarative *how* reading is not available in question-oriented environments; this type of clause will only be found with certain verbs.

'Rhetorical' or 'biased' wh-clauses

The final type of 'special' *wh*-clause is 'rhetorical' *wh*-clauses. With this type of *wh*-clause, as with *wh*-exclamatives, the purpose of using such a *wh*-clause is not to indicate that this is a question that requires answering, but to express some kind of attitude to its answer: doubt, surprise, suspicion, or emphasis on its importance. There is also an expectation on the part of the speaker/writer that the attitude is or should be shared with other discourse participants; clues as to this attitude (the expected interpretation) are not generally confined to the *wh*-clause itself but are also found in the co-text. 'Rhetorical' or 'biased' *wh*-clauses are not necessarily formally distinct from 'genuine' *wh*-clauses, which may explain why they have received little attention in the literature.

Some rhetorical *wh*-clauses have a 'biased' reading, that is, 'the speaker is predisposed to accept one particular answer as the right one' (Huddleston &

Pullum 2002: 879). Some examples are provided in Figure 2.4. Lines 1-2 are rhetorical *yes-no wh*-clauses, which express an attitude of doubt, hesitation or suspicion which the reader or listener is encouraged to share. Line 3 shows a 'variable' instance with *what*, where the suggestion again is that the answer to the implicit question is obvious and generally in some way extreme, with negative implications for those involved (*the place would go crazy*). Lines 4-6 are instances where the answer to the question is presented as unknown or unknowable, serving to emphasise the attitude of the speaker, frequently that of bafflement or incomprehension. Lines 7 and 8 show examples of *wh*-clauses as 'pre-announcements' (Schegloff 1988), that is, as preparing the addressee for important information to follow. In these examples the addressee is not expected to actually guess the answer; as Schegloff observes, a normal response to a *wh*-clause interpreted as a 'pre-announcement' is to repeat the *wh*-word, as in line 8, although sometimes the addressee is not given time to even do that (line 7). The function of the *wh*-clause is thus to draw attention to the importance of the answer, with the implication being that it is newsworthy in some way.

1	The Bohemians thought that they were glimpsing 'humanity at large', the 'throng', but more recently historians have	questioned whether	that was the case .
2	They went on a honeymoon to India where Gould sulked profusely and Rebuck kept	wondering if	she had done the **right** thing.
3	Can you	imagine what	would happen if I had a rest. The place would go crazy.
4	I want to talk about Alex Household.' 'I can't	think what	relevance he has to **anything**.'
5	Christina took a big gulp of champagne, and	wondered what	**on earth** she was going to find to talk about all evening with this woman.
6	I don't	know where	he gets the gall.
7	You'll never	guess what	's happened? Oliver has gone and lost his job .
8	'Yeah	guess how	much that cost?' 'How much?'

Figure 2.4. Examples of rhetorical and biased *wh*-clauses

The bolded items in Figure 2.4 indicate that there are certain signals that a *wh*-clause is intended as having a rhetorical meaning, including evaluative adjectives such as *right* and emphatic items such as *on earth* and *anything.* However, certain verbs and governing expressions (e.g. QUESTION in line 1; *can you imagine...* in line 3) are more associated with this meaning.

Rhetorical *wh*-clauses are of note for several reasons. They show phraseological restrictions on their use in that, as Figure 2.4 suggests, they are mainly found either with verbs of asking, thinking or knowing.

2.6.3 Types of wh-clause: conclusion

There are two general types of *wh*-clause, 'genuine' and 'special'; their interpretation is not independent of their co-text, although there may be associated markers in the case of rhetorical *wh*-clauses. 'Special' *wh*-clauses are associated with *wh*-exclamatives in that they express an attitude towards the answer and/or increase the specificity provided. Most importantly, there appears to be an association between certain *wh*-clause types and the meanings of the verbs they complement which can be helpful in categorising **V wh** instances.

2.7 Conclusion

This chapter has provided a survey of the modality literature, showing how previous studies have generally recognised similar categories of modal meaning, as well as a number of different forms. However, the general tendency in corpus studies to focus on the more easily retrievable modal and semi-modal verbs means we lack information about other forms which may express similar meanings. Indeed, the possibility exists that there are other forms which have not yet been described. However, most studies do not suggest means by which one could investigate whether or what these other forms are. The approach suggested by Hunston (2011) of focusing on an 'attractor' of modal meanings seems a potentially fruitful one in this regard and the **V wh** pattern a promising candidate. The next

chapter seeks to ascertain the extent to which this pattern may be an attractor and,

if so, how to investigate the types and exponents of modal meaning that it attracts.

CHAPTER 3 – METHODOLOGY

3.1 Introduction

This chapter is divided into two parts. The first of these presents a preliminary study conducted to test Hunston's hypothesis that the **V wh**[1] pattern acts as an 'attractor' of modal forms. This is followed by an evaluation of the results of the preliminary study, points arising from which are used to inform the qualitative methodology described in the second part of the chapter. This second part describes the steps involved in this methodology and introduces the notion of the 'meaning frame', the approach taken to grouping **V wh** verbs by meanings and investigate the modal meanings and exponents associated with them.

3.2 A preliminary quantitative investigation of the association between modal markers and the V wh pattern[2]

This section outlines the preliminary study undertaken to which established that the **V wh** pattern was a good candidate for extensive fieldwork into the expression of modal meaning in English.

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[1] as noted in Chapter 1, unless otherwise indicated, in this study **V wh** includes also verbs with infinitival *wh*-clause complements (**V wh-to-inf**)

[2] an earlier version of this section appeared as Vincent (2013)

*3.2.1 Initial observations of the association between **V wh** and modal meaning*

The hypothesis that verbs with *wh*-clause complementation (the **V wh** and **V wh-to-inf** patterns in Francis et al. 1996) may attract expressions of modal meaning arises from two main observations made by Hunston (2003). The first of these is that the distribution of the different forms of DECIDE (*decide, decides, decided, deciding*) in the 450-million-word 2002 Bank of English changes quite drastically when it is followed by a *wh*-word. Hunston's search included the wh-words *what, where, when, why, who, how, if* and *whether*. As we can see from Table 3.1, the percentage of total instances accounted for by the uninflected form *decide* rises dramatically when DECIDE is followed by a *wh*-word.

Table 3.1. Distribution of DECIDE and DECIDE *wh* in the BoE in terms of percentages by wordform (adapted from Hunston (2003: 37))

	distribution of forms of DECIDE	distribution of DECIDE *wh*
decide	28%	70%
decided	61%	9%
decides	5%	4%
deciding	7%	17%

The second, related, observation Hunston (2003: 38) makes is that, looking at concordance lines of *decide* + *wh*-word, '*decide* is rarely finite', tending to occur instead either with modal verbs or 'modal-like expressions' involving *to*-infinitives.

As Hunston notes, the modal meaning derives from the fact that such instances usually refer to a decision that has yet to be made. To illustrate, Figure 3.1 presents the first 10 concordance lines from a randomized search for *decide* + *wh-*word in the British National Corpus (BNC) using the BNCweb CQP Edition (Hoffman & Evert 2008). All of the instances shown here conform to Hunston's observation that the decision referred to has yet to be made. We can note that there is only one line where *decide* is not infinitive, line 4, which involves imperative *decide*, a form associated with the expression of obligation as discussed in Section 2.4.1. The other lines either feature modal auxiliaries (lines 2 and 3) or *to-*infinitives, typically in expressions that can be associated with modal meaning. Lines 6, 8 and 9 involve the semi-modals HAVE (*got*) *to*, and NEED *to* (Coates 1983, Collins 2009). The other lines contain other forms (bolded) that are not typically discussed in the literature, but nonetheless talk about unrealized decisions.

1	an appellate court **has power to**	decide whether	the decision under appeal was 'right or wrong'
2	9.1 [gap:name] **shall** initially	decide whether	or not proceedings shall be brought against third parties
3	it has to refer the application to the secretary of state so that he **can**	decide whether	to 'call in' the proposal and deal with it himself .
4		Decide whether	you want to show variety or whether you want to develop a theme .
5	**To**	decide whether	or not the increases are realistic , you have to look at the expenses side .
6	you **have got to**	decide whether	things at present are tolerable or not tolerable
7	**The point is** for you **to** think	decide what	you think [unclear] .
8	Closer to home we **have to**	decide whether	[…] to recognise that an increase in food prices […] would be rather like the poll tax .
9	we **need to**	decide whether	there is any real difference between 'humanities' and 'arts'.
10	You**'ve** then **got the time to** look at your report,	decide whether	it 's suitable

Figure 3.1. Random 10-line concordance of 'decide (who|what|where|why|when|how|whether|if)' from BNCweb

These observations suggest a relationship between *to*-infinitives and modal meaning noted by Hunston (2003, 2008, 2011) in this context, but more generally alluded to by Perkins (1983). Quirk et al. (1985: 150) refer to the infinitive as the 'least finite' form, stating that it 'typically expresses nonfactual meaning', one of the most important aspects of modal meaning. Similar observations are made by Halliday & Matthiessen (2004) and Gabrielatos (2010).

In the case of DECIDE, then, there is evidence that the choice of the uninflected form *decide* is associated with the choice of *wh*-clause. Moreover, investigation of such instances suggests that they are a rich source of modal expressions; DECIDE *wh* is an ''attractor' of modal meaning' (Hunston 2011: 66).

This raises the question of whether **V wh** verbs more generally are attractors of modal meaning.

Hunston (2003) investigates distributions of a ten-verb sample of **V wh** verbs[1] with mixed results. However, there are some methodological issues with Hunston's study, which, as Table 3.1 indicates, involved comparing the percentages of overall frequency attributable to four forms of the verb with any complementation pattern and the distributions when followed by *wh*-clause. Firstly, this approach involves descriptive rather than inferential statistics and so does not tell us whether any difference observed is statistically significant and therefore likely to be observed in another corpus; for verbs such as DECIDE, the differences in distributions are very clear, but for other verbs (e.g. ACCEPT, MENTION) this is not the case. Secondly, Hunston's approach does not separate '**V wh** instances' (**V wh**) from 'not **V wh** instances' (**V ¬ wh**), meaning that they are not independent samples, making comparison of the two figures less reliable. Finally, even where a clear increase can be seen in terms of proportion of the verbal paradigm when the base form is followed by a *wh*-clause, we cannot know whether this is due to an increase in infinitives or not. This is because no distinction is made between the formally identical infinitive and base form (i.e. simple present following *I, you, we, they* and imperative), nor indeed is such a distinction possible to in the corpus Hunston (2003) consulted (the Bank of English accessed via the LookUp software

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[1] ACCEPT, CALCULATE, DISCERN, ESTABLISH, HEAR, MENTION, RECOMMEND, SAY, SURMISE, FIND *out*

at the University of Birmingham).

What remains to be shown, therefore, is whether a wide range of **V wh** verbs attract modal meaning, and thus whether they merit extended fieldwork into the expression of modality in English. The remainder of this section describes an investigation carried out to ascertain whether an association between the infinitive and the **V wh** pattern can be seen for all verbs that occur frequently in the pattern, showing how the chi-square test of independence can be used for this purpose. Such an association is important to establish since the infinitive is the form that occurs after modal verbs and infinitival *to*. Section 3.2.3 then investigates whether such an association, once established, may be attributed to co-occurrence with modals and *to*-infinitives. Section 3.2.4 offers a critique of the methodology and the results.

3.2.2 Corpus and interface used

In order to ascertain whether frequently occurring **V wh** verbs show a tendency to occur in the infinitive form, it was decided to conduct a corpus-based analysis using a large corpus of general English. As noted above, Hunston (2003) consulted the BoE using the LookUp software; using this means of access, the corpus contains around 450-million words, making it one of the largest of its type and a good candidate for use in this study. However, as Davies (2010) points out, the BoE has certain design drawbacks which arise from its somewhat opportunistic compilation

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process and which make it unbalanced. For example, it contains a very high proportion (more than 50%) of news and magazine articles, but a very low proportion of academic texts (around 1%) which are, moreover, all from US textbooks rather than a full range of academic texts (journal articles, books, grant proposals etc.). It would therefore seem that the BoE is a less than ideal candidate for a study seeking to investigate the grammatical properties of general English. Further, as already mentioned, one of the chief issues with the BoE accessed using LookUp from the perspective of this study is the inability to compose queries that distinguish between the formally identical but functionally distinct infinitive and 'base' form of a verb. For these reasons, the BoE was discarded from consideration.

Instead it was decided to consult the 100-million-word British National Corpus (BNC), using the online BNCweb CQP Edition (Hoffman & Evert 2008). While being relatively old, having been compiled in the early 1990s, Hanks (2013: 93) argues that 'it still provides valid evidence for the patterns of present-day language... because mainstream linguistic norms do not change that quickly'. Another important feature of the BNC is that it is a carefully compiled, 'non opportunistic' corpus (Burnard 2002) which attempts to achieve balance at a number of levels inasmuch as this is possible. As Burnard (2007) points out, ideally it would be preferable to have more spoken than written material in the corpus but due to the fact that spoken material is far more difficult and expensive to collect, the proportions are around 90% written to 10% spoken. These two parts of the

corpus were carefully planned. In terms of its written texts, the inclusion of texts took into account three main selection criteria: domain, or subject area (9 were defined), the date of publication (3 ranges: 1960-1974, 1975-1984 and 1985-1993), and the medium, or type of publication (5 categories) (Burnard 2007, Hoffman et al. 2008). The proportions of these were decided in advance based on evidence such as library lending statistics, sales, circulation figures and catalogues of published works (Burnard 2007). While not criterial, other 'descriptive features' such as age of target audience and sex of author were also considered where possible. The spoken component of the BNC has two separate parts to include both 'demographically sampled' spoken conversation and speech in particular contexts (business, educational and informative, leisure and public or institutional). The conversations were collected by a representative range of male and female respondents living in different parts of the country, including different age groups and social classes (Hoffman et al. 2008).

A further important feature of the version of the BNC accessible through the BNCweb interface is that it is tagged to allow researchers to specify which form is searched. For lexical verbs, the CLAWS 5 tagset used in the BNC recognises six different forms: VVB - the 'base' form (which includes imperatives as well as uninflected present simple); VVI - the infinitive; VVD - the past tense form; VVN - the past participle form; VVZ - the *-s* form; VVG - the *-ing* form. This six-way distinction offers a significant methodological advantage over the tagset used in the Bank of English consulted by Hunston (2003).

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*3.2.3 Selection of **V wh** verbs and query procedure*

The most comprehensive list of **V wh** verbs in the literature is that provided by Francis et al. (1996: 105-112), who provide around 150 verbs in the **V wh** pattern. These they divide into six meaning groups: the ASK group; the THINK group; the DISCOVER group; the SHOW group; the DETERMINE group; and 'verbs with other meanings'. Some verbs are listed in more than one group to account for different senses that they have – to some extent following the senses described in the second edition of the Collins COBUILD English Dictionary (CCED). These verbs have a wide range of **V wh** frequencies in the BNC, from SUSS *wh* with 1 instance, to KNOW *wh,* with more than 32,000 occurrences. Since the form of interest in this study was the infinitive, an arbitrary minimum threshold of 100 instances of _VVI tagged **V wh** verbs was applied for the preliminary study to ensure that there were enough instances to draw meaningful conclusions. All figures quoted in this section are based on queries of the relevant verb form with its tag immediately followed by the *wh*-words *who, where, whether, when, why, what, which, how, if, whose,* and *whom*. These are the main *wh*-words listed in Francis et al. (1996) and other studies of *wh*-clauses referred to (Quirk et al. 1985; Trotta 2000; Huddleston & Pullum 2002). For example, the query entered on BNCweb to retrieve instances of KNOW *wh* was as follows:

(know_VVI|know_VVB|knows_VVZ|knowing_VVG|knew_VVD|known_VVN)

(who|where|why|what|when|how|which|whether|if|whose|whom[1])

To retrieve instances of particular forms of a verb such as KNOW, the relevant form and tag was written followed by *wh*-words. Thus, the query for the infinitive form of KNOW followed by *wh*-words was:

know_VVI (who|where|why|what|when|how|which|whether|if|whose|whom)

Table 3.2 lists the 47 verbs that passed the threshold, with figures for the total number of **V wh** hits for all forms of the verb as well as the number of hits for the infinitive form followed by a *wh*-word (**VVI wh**) in the BNC. The verbs are listed in the groups in which they appear in Francis et al. (1996). Two verbs, CHOOSE and QUESTION were not originally listed in Francis et al. (1996), which is why they are here classed as 'groupless'. The likely reason for their being overlooked is that the criterion for including a verb in a particular pattern was whether it was listed as such in the CCED; since CHOOSE and QUESTION were not listed as having the **V wh** pattern, they were not included (Hunston, personal communication). The verbs REALISZE and RECOGNISZE are written thus to indicate that both spellings for verb were considered and the results were combined; in the rest of this thesis, *recognise* and *realise* should be understood as standing for both spellings of these two verbs.

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[1] in specifying the tag for each form of the verb, rather than simply using the verbal lemma KNOW, which can be retrieved with the query {know/V}, tokens with ambiguity tags, which by definition are less likely to be reliable, are not retrieved

Table 3.2. V wh verbs in the BNC with more than 100 **VVI wh** hits

Meaning group	Verb	V wh hits	VVI wh hits
1: ASK	specify	220	114
	describe	805	179
	discuss	421	184
	ask	4756	1239
	explain	2898	1370
	say	5298	2003
2: THINK	worry	134	112
	appreciate	243	137
	forget	753	173
	predict	246	204
	guess	531	229
	believe	443	311
	mind	753	421
	imagine	760	561
	care	717	597
	think	2609	720
	wonder	7925	796
	consider	1672	860
	understand	2975	2191
	know	32693	17971
3: DISCOVER	figure out	126	105
	recognisze	265	127
	notice	434	137
	investigate	245	138
	ascertain	207	164
	judge	252	188
	check	340	227
	assess	395	254
	find	659	268
	establish	556	364
	realisze	1334	477
	learn	1013	478
	hear	970	505
	work out	851	533
	discover	926	558
	tell	1430	795
	find out	2651	1761
	remember	2359	1301
	see	14550	9485
4: SHOW	demonstrate	370	116
	reveal	338	121
	indicate	659	300
	show	2531	813
5: DETERMINE	determine	1497	1034
	decide	3842	2167
Groupless	question	288	133
	choose	306	222

3.2.4 Ascertaining the association between the infinitive and V wh

It was decided in this study to use the chi-square test to establish whether apparent distributional differences between **V wh** and **V ¬ wh** are statistically significant. The chi-square test is well-established in corpus studies (Baron et al. 2009) since it offers a means of determining whether differences observed between categorical variables are statistically significant and therefore whether they are likely to be seen in outside the current corpus. It has the advantage over other parametric tests such as the *t*-test that it does not assume normal distribution of data, an assumption that rarely if ever applies in natural language data (Stefanowitsch & Gries 2003). In this case the variables involved are the different forms of the verbal paradigm and whether or not each form is complemented by a *wh*-clause. Therefore, in order to carry out this test, it was necessary to establish the **V ¬ wh** and **V wh** frequencies for each verb from Table 3.2 to produce contingency tables such as the one for DECIDE provided in Table 3.3.

Table 3.3. Contingency table for forms of DECIDE with and without *wh-* complementation

Forms	V ¬ wh	V wh	Sum (total hits in BNC)
decided_VVD	7138	67	*7205*
decided_VVN	5155	196	*5351*
decide_VVI	2638	2167	*4805*
deciding_VVG	922	838	*1760*
decide_VVB	1318	438	*1756*
decides_VVZ	741	136	*877*
Sum	*17912*	*3842*	*21754*

According to the null hypothesis of no interaction between the complementation pattern and the form of the verb, the proportions observed in the **V ¬ wh** and **V wh** columns in Table 3.3 would be similar. For example, looking at the past form of decide (decided_VVD) in Table 3.3, given that there are 7205 hits for this form in the corpus, and that there are 17912 instances of DECIDE which are not followed by a *wh*-clause and 3842 instances of DECIDE *wh*, we might expect to see these 7205 hits distributed in the ratio 5932.5: 1272.5 – the two 'expected' values which are calculated by the chi-square test using R (R Development Core Team 2011; see Table 3.4). In fact, the observed values are 7138 and 67, indicating that past tense *decided* occurs far less often than might be expected followed by a *wh*-clause and far more often than expected without *wh*-clause complementation. The chi-square test takes into account the differences between observed and expected frequencies for every cell in calculating a statistic that can then be used to provide a p-value according to the degrees of freedom (here, 5); the higher the chi-square

score, the bigger the difference between observed and expected scores and the less likely that this difference can be attributed to chance.

Table 3.4. Expected frequencies for DECIDE using the chi-square test

Forms	V ¬ wh expected	V wh expected
decided_VVD	5932.5	1272.5
decided_VVN	4406.0	945.0
decide_VVI	3956.4	848.6
deciding_VVG	1449.2	310.8
decide_VVB	1445.9	310.1
decides_VVZ	722.1	154.9
Total	*17912.1*	*3841.9*

For DECIDE, the chi-square test yields a very low p-value of $p < 2.2e\text{-}16$ ($x^2 =$ 5748.171, df 5), the value provided by R as a default when p is very small; we can be very confident that the observed values are not due to chance. Since this is a test that gives a sum for the whole table and involves squared numbers, it is impossible to say which cell in the table has had the greatest effect on the result (Gries 2014; Hinton 2004). However, it is possible to see which cells have the greatest effect on the chi-square result and the direction of this effect by calculating Pearson residuals for each cell, using the formula *observed – expected / √ (expected)* (Gries 2014). As we can see from the residuals for DECIDE in Table 3.5, the cell which has the highest figure, and therefore the highest effect size, is 'decide_VVI wh'. This provides statistically robust confirmation of Hunston's (2003) observation, indicating that there is a close association between the infinitive and

wh-clause complementation for DECIDE.

Table 3.5. Pearson residuals for DECIDE

Forms	V ¬ wh expected	V wh expected
decided_VVD	15.6509918	-33.793660
decided_VVN	11.2846693	-24.365885
decide_VVI	-20.9600582	**45.257009**
deciding_VVG	-13.8480038	29.900643
decide_VVB	-3.3628418	7.261056
decides_VVZ	0.7028848	-1.517671

The calculations carried out for DECIDE were applied to all the verbs listed in Table 3.2 to ascertain whether a similar association was found for them.

Table 3.6 presents the results of the tests to determine whether the distributions for each verb are independent and then which cell has the greatest positive effect on the result. The difference between the distributions of **V ¬ wh** and **V wh** is significant for almost all of the verbs; we can be confident that they are independent. However, several points need to be raised regarding these results. Firstly, chi-square scores for the less frequent **V wh** verbs FIGURE *out* and WORRY cannot be considered reliable because expected frequencies were lower than 5 in more than 20% of the cells (Hinton 2004, Gries 2014). Gries (2014) points out that the Fisher exact test can be used in such situations: for FIGURE *out* the result of the test suggests that the two distributions are independent (p = 8.896e-05); this test does not allow us to say which cell might be responsible. In the case of WORRY, neither the Fisher test nor the chi-square test indicates that we can be confident

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that the distributions are independent. Since FIGURE *out* and WORRY are the two verbs with the lowest overall frequencies, this finding vindicates the decision to set a minimum threshold of 100 VVI *wh* hits for statistical analysis, since verbs with lower numbers of hits are unlikely to provide high enough frequencies over the whole contingency table for an analysis of this type to be carried out. The other verb with a relatively high p-value is APPRECIATE, which also has a low number of VVI *wh* hits.

Table 3.6 shows that, in the large majority of cases where the chi-square approximation is reliable, the cell with the highest Pearson residual scores is the one which links the VVI form and the *wh*-clause. For all but nine of the verbs surveyed, the infinitive is closely associated with *wh*-complementation. Moreover, most of these nine verbs still show a positive association with the infinitive. The only exceptions to this tendency are the verbs FORGET and WONDER, whose Pearson residual figures suggest that the VVI form is actually less likely to occur with a *wh*-clause than expected.

Table 3.6. Results of chi-square tests for all the **V wh** verbs sampled

GP1 Meaning group	Verb	χ2 test result, df: 5	p-value	Cell with highest + Pearson residual
1: ASK	specify	133.3847	< 2.2e-16	VVI wh
	describe	549.6636	< 2.2e-16	**VVZ wh**
	discuss	145.196	< 2.2e-16	**VVB wh**
	ask	271.3174	< 2.2e-16	**VVN wh**
	explain	903.6679	< 2.2e-16	VVI wh
	say	3800.165	< 2.2e-16	VVI wh
2: THINK	worry	NA	NA	VVI wh
	appreciate	15.1057	.00992	VVI wh
	forget	82.4767	2.543e-16	**VVN wh**
	predict	357.6515	< 2.2e-16	VVI wh
	guess	152.1395	< 2.2e-16	VVI wh
	believe	357.0423	< 2.2e-16	VVI wh
	mind	186.0114	< 2.2e-16	VVI wh
	imagine	228.1284	< 2.2e-16	VVI wh
	care	218.0428	< 2.2e-16	VVI wh
	think	310.1665	< 2.2e-16	**VVB wh**
	wonder	181.6447	< 2.2e-16	**VVD**
	consider	893.9018	< 2.2e-16	VVI wh
	understand	862.3009	< 2.2e-16	VVI wh
	know	16357.64	< 2.2e-16	VVI wh
3: DISCOVER	figure out	-	8.896e-05*	-
	recognisze	44.7903	1.601e-08	VVI wh
	notice	26.356	7.611e-05	VVI wh
	investigate	61.7216	5.355e-12	VVI wh
	ascertain	63.243	2.592e-12	VVI wh
	judge	246.3078	< 2.2e-16	VVI wh
	check	137.8872	< 2.2e-16	VVI wh
	assess	193.0177	< 2.2e-16	VVI wh
	find	76.6736	4.161e-15	**VVN wh**
	establish	384.4421	< 2.2e-16	VVI wh
	realisze	37.5965	4.547e-07	VVI wh
	learn	115.9586	< 2.2e-16	VVI wh
	hear	246.5431	< 2.2e-16	VVI wh
	work out	240.216	< 2.2e-16	VVI wh
	discover	758.6143	< 2.2e-16	VVI wh
	tell	783.1505	< 2.2e-16	VVI wh
	find out	401.3436	< 2.2e-16	**VVD**
	remember	433.7166	< 2.2e-16	VVI wh
	see	9195.167	< 2.2e-16	VVI wh
4: SHOW	demonstrate	53.7166	2.40e-10	**VVZ wh**
	reveal	67.1383	4.03e-13	VVI wh
	indicate	327.5844	< 2.2e-16	VVI wh
	show	712.9857	< 2.2e-16	VVI wh
5: DETERMINE	determine	1400.748	< 2.2e-16	VVI wh
	decide	11254.74	< 2.2e-16	VVI wh
Groupless	question	104.8681	< 2.2e-16	**VVB wh**
	choose	356.7081	< 2.2e-16	VVI wh

*3.2.5 The association between modal verbs, to and **V wh** verbs*

Section 3.2.4 presented statistical evidence that, for the majority of frequently occurring **V wh** verbs there is an association between the syntagmatic choice of *wh*-clause and the paradigmatic choice of the infinitive. This is a promising finding in that it indicates the potential of instances of this pattern to attract modal expressions. However, it does not show whether these infinitive forms combine with modal auxiliaries or are part of *to*-infinitives, which are thought to be a good indication of the presence of modal expressions; one also finds infinitive forms following negative *do not / don't*. It was thus necessary to ascertain the proportion of infinitives (**VVI wh**) that follow modal auxiliaries or *to.*

As a means of ascertaining the proportion of instances of **VVI wh** for each verb that either involve a *to*-infinitive or are qualified by a modal verb, searches were undertaken for each verb followed by a *wh*-word and preceded by a modal (tagged _VM0 in the BNC) or infinitival *to* (the _TO0 tag[1]) allowing for an optional intervening negative marker (*not, n't*; the _XX0 tag). It was then possible to calculate the percentage of overall **VVI wh** instances these accounted for. The results are shown in Figures 3.2 and 3.3.

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[1] this tag is useful because it also retrieves instances of *wanna* and *gonna*
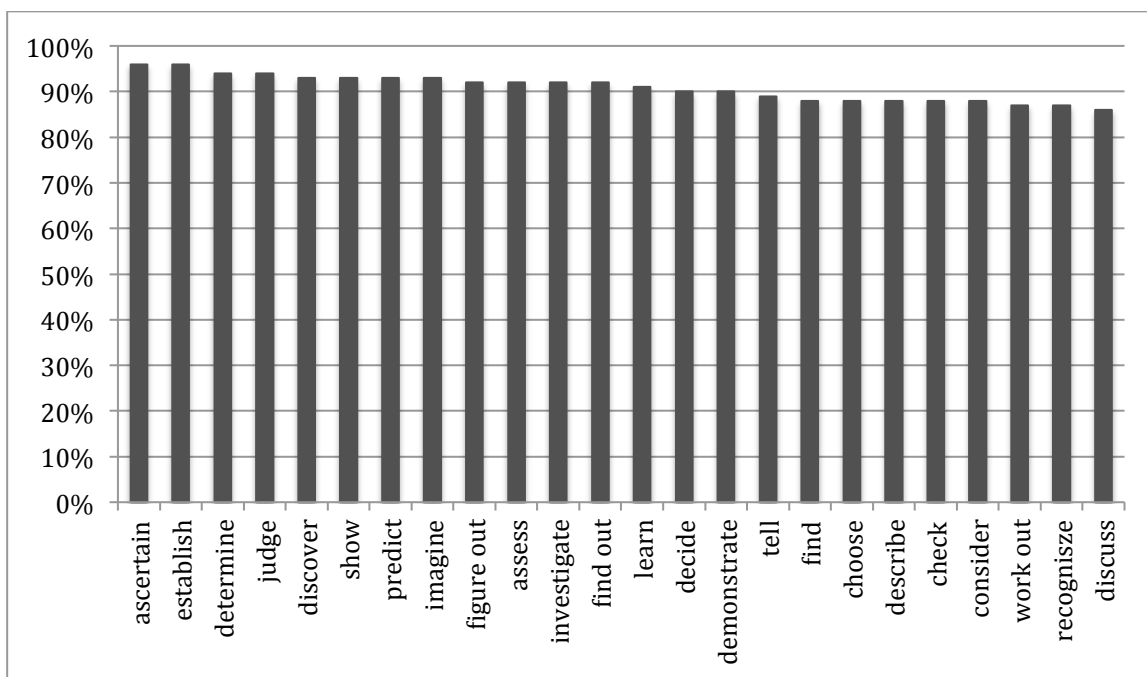
Figure 3.2. Percentages of **VVI wh** instances which are preceded by modal / *to*: higher percentage verbs

Figures 3.2 and 3.3 show that, for the majority of these verbs, modal verbs or *to*-infinitives account for a very large proportion of instances of **VVI wh**; 31 of the 47 verbs are at 80% or higher and 37 of the 47 are at 70% or higher. This suggests that these instances are likely to be a good source of modal expressions of the sort mentioned by Hunston (2003, 2008, 2011).
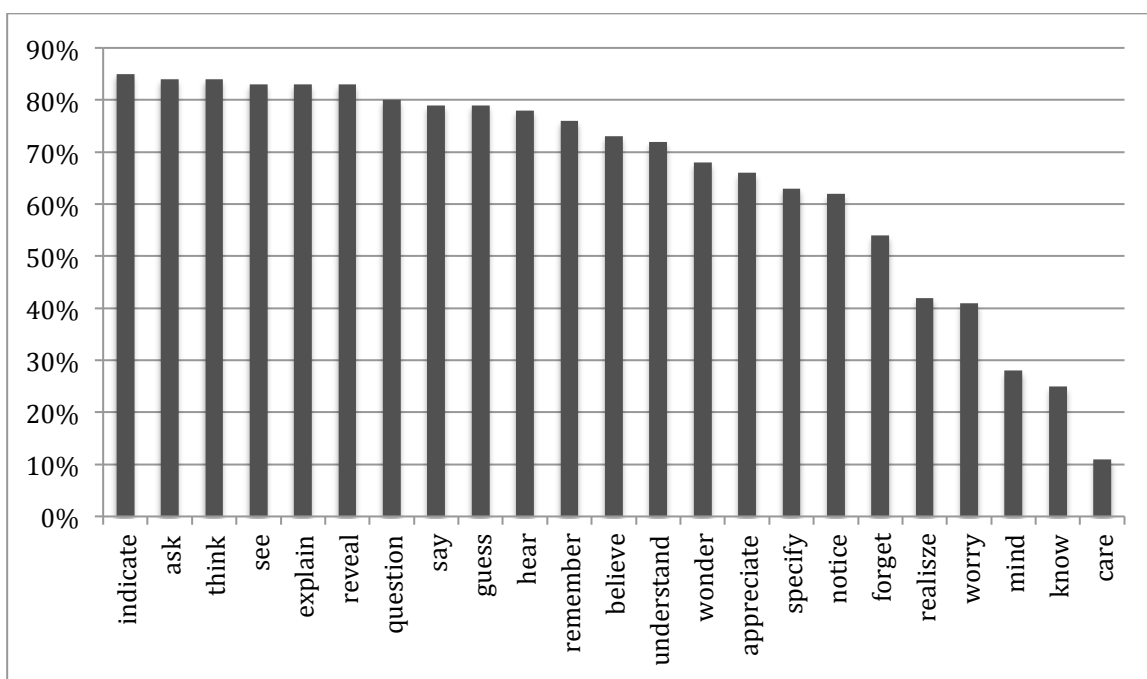
Figure 3.3. Proportions of VVI wh instances which are preceded by modal / *to*: verbs with lower percentages

It is also interesting to note that the verbs which show lower associations with modal verbs and *to*-infinitives (see Figure 3.3) – with the exception of SPECIFY – tend to be classed as 'stative' (Coates 1983) or 'inert' (Leech 1987) in the literature, since they generally refer to situations over which the subject-referent is seen as having little control. One does not generally ask another person to *know*, *realise*, *care*, *mind*[1] or *wonder* about something. Coates (1983) notes an association between epistemic modal meaning and this type of verb. It seems significant that 7

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[1] That is, where *mind* and *care* are approximate synonyms. The other sense of *mind* ('be careful' – sense 4 in the CCED) – as in 'mind the gap' – does refer to a situation over which the subject referent has control. This finding, however, may suggest that this second sense is less frequent.

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of these verbs are classed by Francis et al. (1996) in the THINK meaning group and two of the exceptions, NOTICE and REALISE, are also closely related in terms of meaning (both are glossed as 'become aware' in the CCED).

3.3 Issues arising from the preliminary study

Section 3.2 shows how a quantitative corpus-based methodology can be used to investigate the hypothesis that there is an association between **V wh** verbs and forms associated with modal meaning. This investigation provides evidence not only of an association between the infinitive form and *wh*-clause complementation for a majority of frequently-occurring **V wh** verbs but also that, in most cases, a large proportion of **VVI wh** instances involve either modal verbs or the *to*-infinitive. Based on the observation that *to*-infinitives are a locus for modal meaning (Perkins 1983; Hunston 2003, 2008, 2011; Gabrielatos 2010), this evidence suggests the **V wh** pattern in general is an attractor of modal expressions of this type and merits further investigation.

However, there are a number of limitations to this preliminary investigation. A first limitation is that, while *to*-infinitives have been associated with modal meaning in several studies, this is no guarantee that all instances of *to*-infinitives with **V wh** verbs will realise modal meanings. Moreover, even where modal meaning is found, the methodology of the preliminary study is not able to distinguish the different types of modal meaning that are realised by these forms.

A second limitation is that a focus on the infinitive over other forms of the verbal paradigm means that other potential ways of expressing modal meaning already noted in Chapter 2 have not been taken into account. These include imperative forms (Huddleston & Pullum 2002; Gabrielatos 2010), modal expressions associated with *-ing* forms of verbs, such as *with the aim of*, HAVE *trouble/difficulty* (Hunston 2011), and *that*-clauses (Perkins 1983; Halliday 1994). It is not clear how the methodology described above could be adapted for this purpose since there is no separate tag for the imperative in the BNC and neither the *-ing* form nor *that*-clauses are as consistently associated with modal meaning as infinitives.

A third limitation relates to the meaning groups themselves. Hunston & Francis (2000) point out that verbs grouped together should not to be considered synonymous. Nevertheless, the recognition that verbs in the same meaning group 'share an aspect of meaning' (Hunston & Francis 2000: 86) suggests that different meaning groups may attract different types of modal meaning to different extents. This tentative assumption is made on the basis of a long line of work in phraseology that has shown meaning and form to be associated (e.g. Sinclair 1991; Gledhill 2000; Hunston & Francis 2000; Stubbs 2001). There are, moreover, some pointers in this direction: the observation made in Section 3.2.5 that the verbs least associated with modal verbs and *to*-infinitives share an aspect of meaning (they are generally stative); the recognition in the categorisation of Francis et al. (1996) that some verbs are polysemous in the **V wh** pattern. The

methodology employed in the preliminary study does not address variability across different meaning groups. It is not clear how this could become possible in any case without clear criteria for distinguishing between the different senses of polysemous verbs such as SEE, which is classed in four different meaning groups in Francis et al. (1996).

The final limitation of the methodology relates to the question of precision regarding the queries used to retrieve instances of the **V wh** pattern (see Section 3.2). Searching for instances of *wh*-words following **V wh** verbs does not allow for a distinction between 'true' *wh*-clauses as recognised by Francis et al. (1996) and clauses that start with *wh*-words but which instantiate other syntactic phenomena. It seems likely that a proportion of instances of these verbs followed by *when,* for example, will be temporal subordinate clauses rather than *wh*-clauses, as in example (1).

(1)   That will be something I need to *discuss when* I meet with managers

         prior to my return to work.

If shares with *when* this ability to occur in clauses which are not interrogative clauses. Hence queries which cannot distinguish between these different cases may lead to potentially serious errors in the results. It seems possible, moreover, not only that the imprecision introduced by this syncretism of *wh*-words, will affect the overall results, but also that the level of precision will vary for different verbs

and for different forms of the same verb.

In summary, this preliminary study may be seen merely as a first step, justifying further in-depth exploratory research into frequently-occurring **V wh** verbs which investigates the types and realisations of modal meaning with each meaning group. The methodology used to conduct this investigation is the subject of the rest of this chapter.

3.4 A qualitative methodology for investigating modal meaning and the V wh pattern

The resolution of the issues mentioned in Section 3.3 was sought in concordance analysis of random samples of all forms of the verbs included in the preliminary study. It is possible to separate this process into three main stages. The first of these was the initial analysis to separate and remove instances of *wh*-clauses retrieved from the BNC which were not 'true' *wh*-clauses (false hits). The second stage was that of grouping (senses of) **V wh** verbs by meaning, taking account of potentially relevant features such as subject type and *wh*-clause realisation. The final stage was to analyse the resulting meaning frames in terms of the modal meanings and realizations that they attract.

3.4.1 Sampling procedure

As shown in Table 3.2, the frequencies of the verbs retrieved using queries included in the preliminary study vary considerably, from 126 for FIGURE *out wh* to over 32,000 for KNOW *wh*. Since it was impossible to consider every instance of very frequent verbs like KNOW, it was decided to take random samples for each verb. The question then was to consider the number of samples to take.

Although random sampling is a common procedure in corpus studies, there is no accepted standard number of instances to sample. Sinclair (1991: 84) in his study of *of* suggests a repeated sampling method, taking 'about thirty examples', preparing a description and repeating the procedure until 'most of the major patterns [have] been exemplified'. Sinclair does not specify how many samples were taken, however. Groom (2007) applies a more systematic procedure involving 3 samples of 100 lines of grammatical keywords, and finds a considerable degree of consistency of patterning across the three samples of *of*. In the area of verb complementation patterns, Hanks (2013) suggests that a sample concordance should be 'several hundred' lines, which should be increased 'if there are more than a dozen patterns'. Coates (1983), meanwhile, samples 200 instances of each modal auxiliary (and semi-modal) from both of the corpora she consults though without discussing reasons for choosing this number. On the basis of a range of previous studies, therefore, it seems that a sample should include at least 100, but preferably more, lines in a random sample. In this case, a sample of 300 lines was

decided on (where possible; all the lines of lower frequency verbs were retrieved).

These were retrieved using the query introduced in Section 3.2 above, that is, for

KNOW *wh* the following was entered in the simple query interface on BNCweb:

(know_VVI|know_VVB|knows_VVZ|knowing_VVG|knew_VVD|known_VVN)

(who|where|why|what|when|how|which|whether|if|whose|whom)

For each verb the order of the lines was set at 'random order' rather than 'corpus

order' and the first 300 lines were downloaded for analysis; the two sentences on

either side of the node were retrieved to try to make sure that there was sufficient

co-text to interpret the lines. There is no guarantee that all realisations of modal

meaning will be retrieved by this sampling procedure; it is possible that very

infrequent phenomena will be missed. At the same time, it is thought that the

approach taken in this study might mitigate against this potential limitation. This is

because, in grouping verbs according to meaning and considering the modal

expressions associated with each group rather than each verb, the chance of

missing exponents may be reduced. Moreover, the practical difficulties of

considering more than this number of lines (more than 13,300) seem greater than

the potential benefit derived from doing so.

3.4.2 Removing false hits from the V wh samples

As noted in Section 3.3, one of the main issues with retrieving instances of the **V wh** pattern from a corpus is that a number of the lines may not in fact be *wh*-clauses in the sense of Francis et al. (1996; see Section 2.5), but instead involve other syntactic phenomena. It was therefore important to find and remove these before proceeding further. The only way of doing this was by examining each concordance line for each verb, which, having been downloaded from BNCweb were opened using spreadsheet software for ease of sorting and saving. This section will outline the main types of false hits and the means of distinguishing between *wh*-clauses and non-*wh*-clauses.

In the simplest cases to resolve, the corpus compilation process seems to have removed punctuation that would otherwise have discounted the lines in question. An example is shown in (2); in this example *explain* is clearly part of a separate sentence from *How,* one indication of which is the capital letter at the beginning of the word. Cases of this sort were checked in the corpus.

(2)   However, it is a move fraught with problems as our writers *explain How* long can it be taken as read?

Examples (3) and (4) show two common types of false hits which were relatively easy to identify and remove.

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(3) I *think if* she went to live in the back woods, you know, way beyond

(4) That will be something I need to *discuss when* I meet with managers

prior to my return to work.

In example (3), the clause in question is a conditional clause rather than a *wh-*clause, which can be seen in that *I think* here means something like *in my opinion* and it could be deleted without greatly changing the meaning of the clause[1]. Example (4), meanwhile, shows *when* used in a temporal subordinate clause rather than *wh-*clause. The phenomena exemplified in (3) and (4) do not present great difficulties in terms of distinguishing them from 'true' *wh-*clauses. This is because there are fairly reliable tests which can be used to check whether the phenomenon in question is a *wh-*clause or not. For both types of clause exemplified in (3) and (4), the possibility of changing the order of clauses in the sentence will tend to discriminate between *wh-*clauses (not usually possible) and other types of clause. Thus, (4) could arguably just as naturally be written as (4a).

(4a) When I meet with managers prior to my return to work that will be

something I need to discuss.

A further test that can be applied to check whether or not a clause starting with *if* is

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[1] In fact all instances of THINK *if* retrieved in the sample were not true *wh-*clauses

conditional is the possibility of substituting *whether,* which indicates a *wh*-clause (Huddleson & Pullum 2002).

A greater challenge is provided by instances such as (5), which Huddleston & Pullum (2002) would term a 'fused relative construction' and Trotta (2000) a 'free relative clause' (henceforth FRC).

(5) The effort of the natives to be heard by the Greeks was evidently encouraged by the curiosity of the Greeks about the natives and, generally speaking, corresponded to the political situation. But the Greeks were seldom in a position to *check what the natives told them.*

The *what*-clause in (5) is not a *wh*-clause because the information included in the clause is not at question in this context – *the Greeks* know the content of what they were told, but want to check if this information is true. The fact that examples like (5) do not involve a *wh*-clause may not always be apparent, not least because the tests suggested for *when* and *if* clauses cannot be used in this case: the FRC, like the *wh*-clause, does not readily change position in the sentence and there is no one-word substitution test such as *whether* for *if.*

One means of distinguishing true *wh*-clauses from FRCs is presented by Huddleston & Pullum (2002). This test for *wh*-clauses depends on whether one can insert *the answer to the question* into the sentence – an example is shown in (7), which is the paraphrase of (6).

(6) They know *where she was born*

(7) They know *the answer to the question 'where was she born?'*

In contrast, an FRC analysis results if one can substitute *the x such that y did x / such that x happened*, as indicated by examples (8) and (9). Huddleston & Pullum (2002: 1071) also argue that the 'variable' (x) in fused relatives is in some way 'anaphorically bound' to an antecedent, so it should be derivable from the co-text. The example they provide does not show how this might be, but a very similar example from the BNC is shown in (10), where the antecedent to *what she saw* is *looked her up and down* in the previous sentence.

(8) I really liked *what she wrote*   (Huddleston & Pullum, 2002: 1070)

(9) I really liked *the x such that she wrote x*

(10) Arlene looked her up and down with a practised eye. Although she gave no hint of it, she liked *what she saw.*

Although this is useful as a test, Huddleston & Pullum's example involves LIKE, which is not a verb that has *wh*-clause complementation; there is not strictly a problem of interpretation here. Moreover, there may not always be a clear 'antecedent', as in example (11), provided by Francis et al. (1996: 109). In such cases, the more important feature is the compatibility or association (and hence co-

referentiality here) between 'things one knows' and 'things one learns'. A similar example is provided from the sample of DESCRIBE in this study, where what is (not) described is the same thing that readers already know. In these cases, as Francis et al. (1996) point out, the possibility of substituting *what* with *the thing that* (or *that which*) indicates that it is an FRC.

(11) Revson knew *what it takes many people a lifetime to learn*.

(12) It would therefore be redundant to *describe what* every courteous author must assume was already known to his readers.

A further feature of *wh*-clauses that can be used to distinguish them from FRCs is 'elliptical reduction' (Quirk et al., 1985; Trotta, 2000; Huddleston & Pullum, 2002), where the *wh*-clause is reduced to its *wh*-word(s). This phenomenon, which is confined to *wh*-clauses, is exemplified by (13), where the *wh*-clause itself is understood (*what check he needed to make*).

(13) 'A last check, sir?' Carrington didn't have to specify *what check*.

(14) Nor does he specify *what kind of effects <u>might be achieved by a reformulation</u>*.

(15) It is a mere auxiliary verb, a syntactical instrument enabling us to specify *what philosophers sometimes used to call the "essence" or "quiddity" of a thing*.

On this basis, where it is possible to carry out an elliptical reduction on a clause, i.e. by deleting the underlined material in (14), this shows that the clause in question is a *wh*-clause. Where this operation is not possible, as in (15), an FRC is indicated. This is a useful test since it generally does not require significant manipulation of the original wording to check.

A further difference between *wh*-clauses and FRCs is that *wh*-infinitive clauses are restricted to *wh*-clauses and cannot appear in FRCs (Trotta 2000; Huddleston & Pullum 2002). This is helpful information in distinguishing between *wh*-clauses and FRCs not only for surface instances of the **V wh to-inf** pattern but also for some other clauses, since a potential paraphrase as an infinitival clause identifies the clause in question as a *wh*-clause (Trotta 2000). To illustrate this, we can consider example (16), where the *wh*-clause can be paraphrased as *what to do next*. This paraphrase only works where the subject of the matrix clause and that of the *wh*-clause are the same.

(16)   I told them I wasn't in a hurry to decide *what I would do next*

While the tests outlined above are generally helpful, none of them is applicable to all cases. Moreover, for difficult cases example the application of syntactically derived tests seems to depend to some extent on one's semantic interpretation of the original sentence.

(17) It really made me appreciate *what I have* - my life, my family and my

home

For example, if (17) is interpreted as having an interrogative meaning, then ellipsis is possible, but if not, then ellipsis is ruled out. Thus it could be argued that tests that purport to be syntactic tests distinguishing between *wh*-clauses and FRCs are in fact really semantic, interpretative and not completely reliable. One might therefore conclude that the most basic test of any *wh*-instance is whether it can be interpreted as implicitly containing a question (Quirk et al. 1985). This is the method pursued in this study. For indeterminate instances encountered, where an interrogative reading is available, the instance was included.

Figures 3.4 and 3.5 show the proportions of samples that contained true *wh*-clauses. From these figures we can see that, of the 47 verbs, 25 have a precision of 90% or higher based on the samples and a further 9 verbs are over 80%.
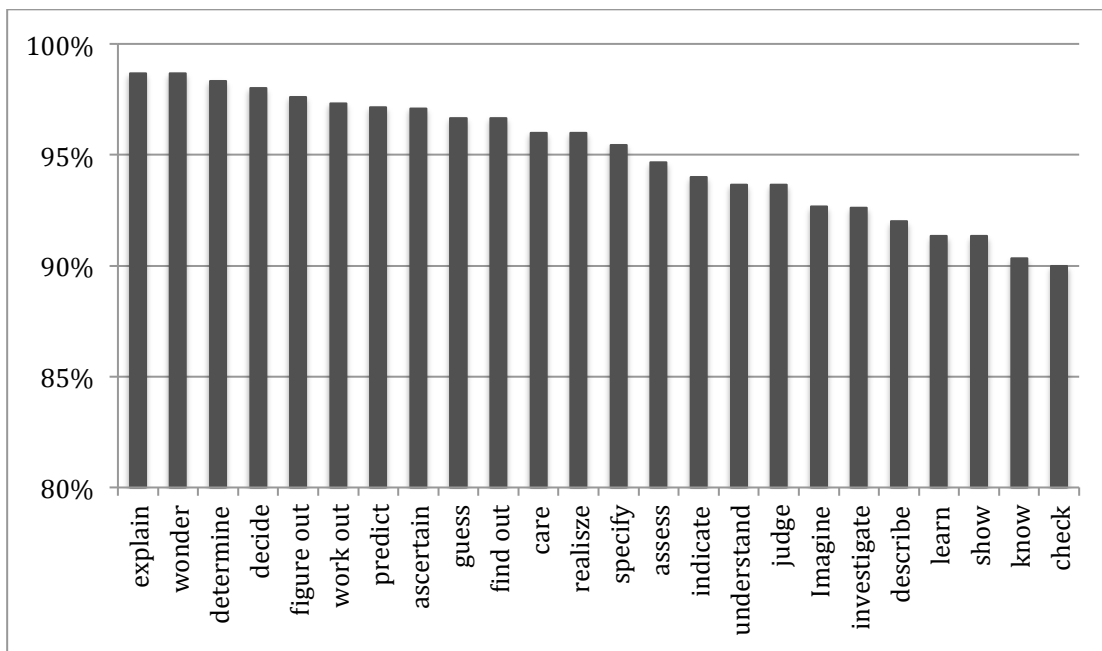
Figure 3.4. 'True' *wh*-clause proportions of **V wh** verbs expressed as percentage of sample; verbs with higher proportions (> 90%)
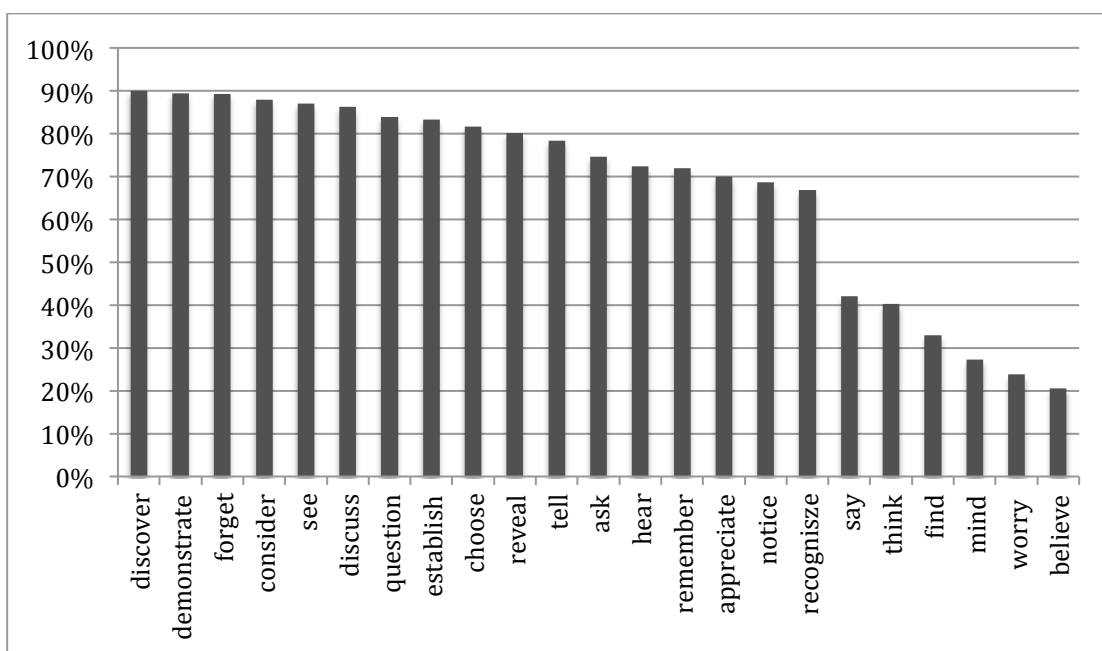
Figure 3.5. 'True' *wh*-clause proportions of **V wh** verbs expressed as percentage of sample; verbs with lower proportions (<90%)

However, the verbs listed on the right of Figure 3.5 and in particular the final six included high proportions of instances which were not true *wh*-clauses. Indeed, in the case of WORRY and BELIEVE, these results mean that these verbs no longer passed the 100-hit threshold, which was imposed in an attempt to try to avoid low numbers in contingency tables that make the chi-square test unreliable (see Section 3.2.3), and these verbs were excluded from the study at this point. In the case of WORRY, which only yields 143 **V wh** hits in total in the BNC (of which only 32 were found to be true *wh*-clauses using the tests outlined above) there was no further data to check. With BELIEVE, in contrast, there were further hits to check (the query BELIEVE *wh* retrieved 443 hits) but even after checking these it did not pass

the threshold.

This section has therefore shown the importance of carrying out this checking procedure before proceeding further, particularly for the verbs listed in Figure 3.5. The next section moves on to describe the methods used to establish the meanings of the remaining **V wh** verbs and group them accordingly.

3.4.3 Establishing meaning frames: a worked example of EXPLAIN *wh*

Having removed those instances that were not relevant to this study, the next stage in the methodology was to address the polysemy of certain **V wh** verbs and establish a means of separating **V wh** instances into different meaning groups in order to investigate the hypothesis that these different groups will be associated with different types of modal meaning. This involves introducing a new notion, that of the 'meaning frame', which is an attempt to address some of the drawbacks of previous approaches by considering the meanings not just in terms of the verbs involved, but also the subject types and *wh*-clauses.

Section 2.6 showed that a number of previous studies (Karttunen 1977, Francis et al. 1996, Biber et al. 1999, Trotta 2000, Huddleston & Pullum 2002) have grouped verbs with *wh*-clause complementation by meaning. Francis et al. (1996), for example, propose five main **V wh** meaning groups, 'ASK', 'THINK', 'DISCOVER', 'SHOW', and 'DETERMINE'. However, these studies do not provide information regarding how this was done; it appears to be largely an intuitive

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procedure (Hunston & Francis 1998). Moreover, in most cases – the exception being Francis et al. (1996) – previous studies do not allow for the fact that certain **V wh** verbs are polysemous, such as DETERMINE, which may mean "find out the answer", "come to a decision" or "influence a situation". It was also pointed out that these previous studies separate formal and semantic *wh*-clause types in ways that this study does not. Francis et al. (1996) distinguishes between **V wh** and **V wh-to-inf** (infinitival *wh*-clauses), while most other studies treat *wh*-exclamatives as a separate phenomenon. For these reasons it was not possible to use pre-existing categorisations. Nevertheless, the fact that these previous categorisations exist and that they broadly agree regarding the meanings involved suggests that verbs classed together share 'aspects of meaning' (Francis & Hunston 2000: 86), which may therefore be identifiable and can be included in the description of the groups. Concordance analysis of the samples paying attention to co-occurrence features likely to be of relevance was seen as providing a means of establishing meaning groups.

The question arises here as to which co-occurrence features may be 'relevant'. This is not the type of question that can be definitively answered, since it will rely to some extent on the approach, aims, experience and preferences[1] of the analyst and the level of detail that is addressed (Kilgarriff 1997, Hunston & Francis 2000, Hanks 2013). Previous work in phraseology has repeatedly shown that different senses of an item are associated with different patterns of usage (e.g.

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[1] for example for 'lumping' or 'splitting' senses (Kilgarriff 1997, Hanks 2013)

Sinclair 1991, Partington 1998, Tognini-Bonelli 2001, Stubbs 2001, Hunston & Francis 2000, Hoey 2005, Gries 2006, Hanks 2013) and also that words with similar meanings share these patterns (Hunston & Francis 2000, Divjak 2006, Gries & Divjak 2006). In terms of verbs, most commonly the features considered to be relevant are complementation patterns and subject types and how they interact with the meanings of the verbs.

If we take the example of the verb REFLECT provided by Hunston & Francis (2000: 255) and deriving from the CCED entry, this verb may mean "send light/heat etc. back off a surface" or "think deeply about" (CCED: 1387); each meaning is associated with 'different types of noun or pronoun ... and with a different complementation pattern' (Hunston & Francis 2000: 255). Thus in example (18), the meaning of *reflected* is associated with that of its subject, *the sun*, as well as the pattern **V off n** realised as *reflected off*, while in (19) it is associated with the pronoun *I* and the pattern **V on n** realised as *reflected on the child's future*.

(18) The sun reflected off the snow-covered mountains

(19) I reflected on the child's future

(examples from Hunston & Francis 2000: 255)

Hanks (2013) takes this further by classifying subject (and object) types and indicating how these different subject types are relevant factors in activating what he terms a verb's 'meaning potential' (decontextualised, or dictionary meaning).

Applying Hanks's ideas to the two examples, we could say that, in (18) *the sun* is one of a number of possible inanimate subjects, usually restricted to "light, heat or other rays" (CCED: 1387). In (19), meanwhile, we could note that the personal pronoun *I* is indicative of the fact that it is usually humans who *reflect*, as indicated by the CCED definition (*when you reflect...*)[1]. Instances involving other verbs observed to have similar usages can then be grouped together. For example, although (20), from the BNC, involves a different verb, GLINT, it has the same pattern **V off n**, a subject referring to light and an object that refers to a surface for the light to come back off.

(20) He turned away and the firelight glinted off the planes of his back

This type of observation is used in concordance analysis of samples of the verbs in question to identify typical uses. It seems possible to apply these observations to the analysis of **V wh** verbs by considering not just subject types but also the *wh-*clause types introduced in Section 2.6.2. This process will be demonstrated by considering a polysemous **V wh** verb, EXPLAIN. This verb is chosen as it is argued here to be polysemous in this pattern, although the two senses distinguished are not widely noted in the literature. All previous studies of *wh*-clause complementation put EXPLAIN in one meaning group, together with other verbs of

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[1] CCED definitions aim to show the typical uses of a word; the use of 'you' in the definition indicates a human subject (CCED: xviiii)

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similar meaning such as SAY and DESCRIBE which relate to 'communicating' the answer to a question.

After removing false hits from the 300-line sample of EXPLAIN *wh* and 3 further instances that were unclear in their meaning[1] 293 lines remained, a sample of which is provided in Figure 3.6. An initial intuition on looking at these lines was that EXPLAIN *wh* does not have the same meaning in examples like line 1 as it does in examples such as line 6. An analysis in terms of their subject types (in bold) and the roles they perform was able to provide evidence to support this intuition. In the first meaning, which could be glossed as "say, communicate", exemplified in lines 1-5, the subject referent (implicit in the case of imperatives such as line 5) has the role of imparting the answer to the question posed by the *wh*-clause. This agentive meaning of EXPLAIN was seen in 225 of the 293 lines (77%). These lines illustrate the most frequent subject types for this sense: names (*Sara*), professional roles (*inspectors*) and institutions (e.g. *the government*) at around 34% of instances; personal pronouns referring to people (29%); documents (including *theories, books, chapters, reports, leaflets, guides* etc.; 16%); and no subject, in the case of imperatives (7%). When they co-occur with EXPLAIN *wh* they can be seen to take on the role of providing the information, or the 'source' of information.

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[1] In 2 of these, from transcribed speech, the transcriber had not been able to understand what was said and had therefore marked a key part of the instance [unclear]. The other instance (HNM 1266) was poorly expressed and incomprehensible

1	Taking a deep breath, **Sara** went on to	explain how	huge the Femidom is.
2	Any **theory** must be useful; **it** must be able to	explain how	or why things happen.
3	Pylon inquiry: **inspectors**	explain how	the hearing will be conducted
4	And when we talk later **I**'ll	explain what	really happened, and it won't be in the way he put it,
5	2 .	Explain why	a shortage of resources in an organization is a short-term phenomenon.
6	**Which** still doesn't quite	explain why	, on the Lovesexy sleeve, Cat is represented by the shape of a heart.
7	This explanation might be thought to fit in with the prerogative nature of the original public law remedies of certiorari, prohibition and mandamus. **It** would also	explain why	the Attorney-General, as representative of both government and people, always has standing to protect public rights
8	Marx sees the process of production of concepts, values, and institutions, as extremely complex . **This complexity**	explains why	the system of concepts and of values has no direct relationship with the process of production; the two don't fit.
9	**That**	explains why	Brian didn't get a look in.

Figure 3.6. Sample of lines illustrating the two senses of EXPLAIN *wh*

The second sense of EXPLAIN *wh*, found in 68 lines (23% of the sample), is shown in lines 6-9 in Figure 3.6. The identification of this sense rested on the observation of typical subject types which seemed different from those seen above. These subject types are items that serve to encapsulate the previous discourse (Sinclair 1982 [2004]) – *this, that, which* (around 44% of instances) – and/or refer to an abstract entity such as *complexity* or *explanation* (other nouns include *factors, evolution* and *legality*; 38%). In these lines, the encapsulated information is presented as providing evidence for the explanation provided; it is not animate or agentive. In this meaning, EXPLAIN *wh* is glossed as "represent the reason why" rather than "communicate". It is also noticeable that, in terms of *wh*-clauses that

occur, *why*-clauses account for over 90% of instances of this second meaning compared to only 35% for the first meaning.

This concordance analysis focusing on the types of entity that 'explain' provides evidence that there are two separate senses of the verb when it is followed by *wh*-clauses. It also shows how a focus on subject types and their relationship with the verb in question and the *wh*-clause is important to distinguishing these two senses. Therefore, the description of the two senses needs to make reference to the subject role. In the case of the first, communicating sense, this is termed the 'source' of information and can be represented as [source] + EXPLAIN + *wh*. In the case of second sense of explain, the subject role is to show the accepted 'situation', or [situation] + EXPLAIN + *wh.*

It is this procedure, involving considerations of interactions between subject type, verb meaning and *wh*-clause type that was used to analyze the meanings of the verbs sampled in this study. Each verb has its own preferences for particular subject types, but, as previous categorizations have suggested, there is a commonality of meaning across groups of verbs which can be captured in this way. This process involves grouping together instances of different verbs which receive a similar analysis. In the case of [source] + V + *wh*, EXPLAIN is therefore just one of a number of verbs that has instances analyzed in this way. These include SAY, DESCRIBE, TELL, INDICATE, DEMONSTRATE and SHOW, summarised as [source] + [describe] + *wh*. Previous studies have all included a group of 'communicating' verbs, so it is not surprising that this study includes instances involving many of the

same verbs. This does not mean that the verbs in the meaning frame have the 'same' meaning, but it does indicate how they 'share an aspect of meaning'; it does not preclude finer distinctions being made where necessary, for example in terms of more specific subject types, such as 'humans' or 'documents' or in terms of person. The resulting meaning frames are shown in Table 3.7 with chapters that they are included in. Each chapter includes a summary indicating how the particular meaning frames were formulated.

Table 3.7. Meaning frames in this study by Chapter.

Chapter	Title	Meaning frames
4	**Finding out**	[knowledge-seeker] + [find out] + *wh*
5	**Thinking**	[decider] + [judge] + *wh* [thinker] + [imagine] + *wh*
6	**Communicating**	[source] + [describe] + *wh* [inquirer] + [ask] + *wh* [commentator] + [question] + *wh*
7	**Knowing**	[knower] + [know] + *wh* [carer] + [care] + *wh*
8	**Others: proving, determining**	[evidence/test] + [show] + *wh* [situation] + [explain] + *wh* [factor] + [determine] + *wh*

This section has given an indication of how meaning frames were formulated. The idea was to capture commonalities of **V wh** instances to be able to group them in terms of subject type and relationship with verb and *wh*-clause. The use of the word 'frame' refers to the possibility of interposing items (i.e. modal verbs, modal expressions) and distinguishing these by type of meaning. The next section will

consider how this was done in terms of the lines representing the two different senses of EXPLAIN *wh*.

3.4.4 The identification of modal exponents with EXPLAIN *wh*

Having identified distinct senses of a verb, in this case EXPLAIN, [source] + EXPLAIN + *wh* and [situation] + EXPLAIN + *wh*, the next step was to sort the lines for these two senses according to the types and exponents of modal meaning that occur with each sense. This procedure involves looking at each instance and deciding what kind of meaning is involved, guided by the modal exponents and meanings reviewed in Section 2.4, that is, considered in terms of whether or not there is an expression of 'obligation', 'volition/purpose', 'potential', 'permission' or 'uncertainty'. The following description of the results of this procedure for the two senses of EXPLAIN *wh* shows how this works and discusses how more difficult instances are dealt with.

3.4.4.1 Analysis of [source] + EXPLAIN + wh: modal and non-modal meanings

All of the different forms analysed as expressing obligation in the lines of [source] + EXPLAIN + *wh* are included in Table 3.8. The total number of instances of obligation found is 53, or around 23% of the lines for this sense of EXPLAIN *wh*. They are classified as far as possible according to the typology introduced in Section 2.4.1,

with the numbers of instances of each form noted in the column on the right.

Table 3.8. Expressions of obligation identified in the lines of [source] + EXPLAIN + wh

Type	forms	instances
imperatives	imperative	17
	let's	
imperative-likes	*Can/could you...?*	6
	Will / would you...?	2
	Will the Minister...?	2
modals	*must*	1
semi-modals	HAVE *to*	4
	had/'d better	1
existential	*it* BE *necessary to*	2
	it BE *important to*	1
	it BE *better to*	1
	all it takes is to	1
	it remains to	1
X ask Y to	X ASK Y *to*	2
	X TELL Y *to*	1
	X FETCH Y *in to*	1
X BE asked to	X BE obliged *to*	1
	X BE *called to*	1
	X BE *challenged to*	1
	X BE *under pressure to*	1
task BE to	*it* BE X's *task to*	2
	the onus REMAINS *on X to*	1
	X HAVE *responsibility to*	1
Other	X BE *spared the task of*	1
	it would be helpful if X	1

While some of the forms in Table 3.8 such as imperatives and HAVE *to* do not present great problems for categorisation, other instances are potentially ambiguous or have not been previously noted; examples are provided in Figure 3.7 with the relevant forms in bold. When analysing forms such as *can you...* that are conventionally associated with requests (Coates 1983, Adolphs 2008), there is a possibility of reference to ability rather than obligation, so it is necessary to refer to

the co-text for support. In Line 1, as with all the other instances, the response indicates that the addressee understood the question as a request for information. In terms of 'existential' expressions of obligation, the anticipatory *it* phraseology *it* BE [important] *to/that* was proposed in Section 2.4.1. Line 2 shows an example involving *better to*; in suggesting that a particular behaviour (explaining) is 'better' than another one (the physical response of smacking) it is being proposed as something that one 'should' do. Line 3, meanwhile, is an example of a formally different (in that *remains* is a verb) but semantically related instance involving anticipatory *it*, included here on the basis of its similarity with 'textual' examples presented by Van linden & Verstraete (2011; see Section 2.4.1).

While ASK and TELL are clear examples of 'asking' verbs, FETCH *in* is not, which is why the example is shown in line 4. This instance and similar ones are included with 'asking' instances on the grounds that there is an identifiable 'obliger' (here, *the keeper*) who required the 'obliged' (*the farmer*) to give the explanation. A similar argument could be applied to the passive instance in line 5. As is evident from those expressions listed in the 'task BE to' category, while a commonality of meaning can be seen here, in that an entity is given some task or responsibility, formally these are quite different. The final line in Figure 3.7 shows the only instance of lack of obligation with [source] + EXPLAIN + *wh*; the similarity to *did not have to* can be seen in that the *cops* as an authority did not require an explanation.

1	'We observed that you were travelling excessively slowly on a wide road, unimpeded by any other traffic. **Can you**	explain why	?' 'Certainly.'
2	In this instance, some people would smack the child, but **it is better to**	explain where	the danger lies and remove the child from that situation.'
3	This pattern of results is enough to make us doubtful about the interpretation of latent inhibition offered by Lubow et al. (1981); but **it remains to**	explain why	latent inhibition procedures should apparently be capable of producing overshadowing but not blocking.
4	the keeper on the shooting estate had realized he had seen the old plough there last week **and had fetched** the farmer **in to**	explain where	it had gone
5	In the general election campaign of 1929 the Liberals **were challenged** by the Conservatives **to**	explain where	the money would come from
6	Whatever, the cops eventually moved on and the Englishman and I **were spared the task of**	explaining what	such an unlikely pair of lads as ourselves were doing with such a gleaming trophy.

Figure 3.7. Examples of expressions of obligation with [source] + EXPLAIN + *wh*

Table 3.9 includes all the different forms of volition and purpose found in the lines of [source] + EXPLAIN + *wh* organised according to the typology shown in Section 2.4.2. These total 49 instances, or 21%.

Table 3.9. Expressions of volition/purpose found in the lines of [source] + EXPLAIN + *wh*

Type	forms	Instances
modals, semi-modals	*will ('ll)*	4
willing to	BE *happy to*	1
	anxious to	1
wanting	WANT *to*	2
	SEEK *to*	1
	BE *devoted to*	1
	FOCUS *on*	1
aim be to	*the purpose of X is to*	1
	the concern of X is to	1
trying	TRY *to*	5
	ATTEMPT *to*	2
	DO *everything X could to*	1
purpose	*(in order) to*	16
	USE X *to*	6
not want, refuse	not WANT to	1
	REFUSE *to*	1
	there's no point in me	1
	not ATTEMPT *to*	1
	MAKE *no attempt to*	1
	not TRY *to*	1

As with the obligation category, while most of the forms in Table 3.9 have already been introduced in Section 2.4.2, some require explanation. All of the instances of *will* included here are first person offers to explain (e.g. *I'll explain why in a minute*) similar volition instances of *will* shown in Section 2.2.4. In terms of verbs of volition, apart from WANT *to* and SEEK *to*, the analysis revealed a sub-group with similar meanings but prepositional complements – FOCUS *on* and BE DEVOTED *to* – which relate to the aims of research (e.g. *much criminological time has been devoted to explaining*). In terms of 'trying' there is one instance of *did everything I could to* –

like *tried*, this suggests effort without guarantee of success. We can also note that lack of volition, more forceful refusal and not trying are found.

In terms of the expression of potential, examination of the lines of [source] + EXPLAIN + *wh* yields 22 instances (around 22% of the total), which are distributed as shown in Table 3.10. All of these forms were noted in Section 2.4.3.

Table 3.10. Expressions of potential identified in the lines of [source] + EXPLAIN + *wh*

type	forms	instances
modal	*can't / cannot* *can* *could not / couldn't* *could*	2 3 6 4
able/ability to	BE able *to* BE unable *to*	2 1
existential	*it* BE *difficult to* *the problem* BE *(to)*	1 2
enabling	X *help* Y *to*	1

Some examples are provided in Figure 3.8 of the forms from Table 3.10. Since *can/could* may also express permission, it is important to ascertain why these instances have a potential reading. In all the examples of *can/could* explain wh, the co-text indicates that there is some expectation on the subject referent to explain: in line 1 it is to explain behaviour; the *Arab*'s inability to do so resulting in arrest, while in line 2 it is the provision of information that enables the *lawyer* to explain, as

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indicated by *so that*. Line 3 shows an example of *problem* BE *to* referring to the difficulty of explaining a question. Line 4 shows the only example of 'enabling' with EXPLAIN *wh*; the factor that makes it possible to explain here is *understanding*.

1	The driver of the jeep said they picked up the Arab for questioning because he **could not**	explain what	he was doing in the area.
2	It was arranged that the husband would telephone Lawyer D, after discussing the matter with his wife, *so that* Lawyer D **could**	explain what	was involved .
3	**The problem is to**	explain how	individuals come to identify their interest with that of a specific group
4	Understanding this connection between the form and the function of language **will help us to**	explain how	stretches of language, like the request for help with the cat, can be coherent without being cohesive

Figure 3.8. Examples of expressions of potential with [source] + EXPLAIN + *wh*

While the range of means of expressing uncertainty introduced in Section 2.4.4 is wide, as Table 3.11 indicates, only 6 instances (3% of the total) occur with [source] + EXPLAIN + *wh*.

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Table 3.11. Expressions of uncertainty identified in the lines of [source] + EXPLAIN + *wh*

Type	Main forms	instances
modals, semi-modals	*will* *may*	2 1
adverbs	*probably, perhaps*	
that-projection	*we are told that*	1
conditional	*if, unless*	
***yes-no* question**	*Have you …?*	1
other	*expect* X *to*	1

Three examples are noted of modal verbs expressing uncertainty, two with *will* and one with *may* and all involving speaker judgements of third person subjects' likelihood of explaining. The epistemic reading of line 1 in Figure 3.9, for example, is made clear by the 'harmonic' expression *I feel sure*. The use of the evidential expression *we are told that* to avoid commitment as to whether the explaining happened reporting verb TELL *that* in line 2 allows the speaker to explicitly avoid commitment – this is an evidential meaning. Equally, the *yes-no* question in line 3 expresses the speaker's uncertainty as to whether the explaining has taken place or not. The 'other' example is shown in line 4 and includes the expression EXPECT X *to* which is potentially ambiguous between an obligation ("I thought the book should") and an uncertainty ("I thought it likely that the book would") reading, in part because it shares a grammar pattern (**V n *to-inf***) with obligation verbs like ASK.

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However, in this case, there is little ambiguity, since the basis for the expectation (*because of this background*) is supplied.

1	I *feel sure* he **will** guide you towards the right medical channel and	explain what	pica is all about .
2	**We are told that** the two abstract "image schemas", BALANCE and LINKS,	explain how	we can and should best explicate and understand King Lear
3	**Have you** promised confidentiality and	explained what	that means ?
4	*Because of this background*, I **expected** a book called Feminism for Beginners **to**	explain why	all this happened when it did .

Figure 3.9. Examples of expressions of 'uncertainty' with [source] + EXPLAIN + *wh*

Not all instances of [source] + EXPLAIN + *wh* involve modal meanings. Other instances occur, which may be (positive) 'indicative', 'negative', or 'other'. There are 79 'indicative' instances (35%) of [source] + EXPLAIN + *wh* which are almost invariably present or past tense. Negative instances include all types of negative structures – including *without*, *nobody* and *nothing*; there are 8 of these (4%). The 8 remaining instances that did not fit into these categories were classed as 'other' and include *–ing* forms acting as a nominal form or following a preposition.

This analysis shows how all 225 lines of [source] + EXPLAIN + *wh* were categorised. The following section will consider [situation] + EXPLAIN + *wh.*

3.4.4.2 Analysis of [situation] + EXPLAIN *+ wh instances by modal and non-modal*

categories

If we now turn to the types of modal meaning found in the 68 lines of [situation] +

EXPLAIN *+ wh*, a different picture emerges. The first point is that there are no

instances of obligation, volition/purpose, potential, or permission.

On the other hand, the sample of [situation] + EXPLAIN *+ wh* yielded 22

instances (32%) that were classed as expressing uncertainty. They are distributed

as shown in Table 3.12.

Table 3.12. Distribution of modal expressions of uncertainty found in sample of [situation]
+ EXPLAIN + *wh*

Type	Main forms	instances
modals, semi-modals	*would* *may* *could* *might* *can*	6 6 5 1 1
adverbs	*probably* *perhaps*	1 1
that-projection	think (that)	1
conditional	*if, unless*	
***yes-no* question**	*Have you …?*	

As Table 3.12 shows, 19 of the 22 instances classed as expressing 'uncertainty'

involve the modal verbs *would*, *may, could, can* and *might*, some examples of

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which are shown in Figure 3.10. We noted the association Coates (1983) makes between this meaning and inanimate or non-agentive subjects for modal verbs in Section 2.2.4. However, *can* is generally only noted to have this type of meaning in 'non-affirmative contexts' (Huddleston & Pullum 2002, Collins 2009). Considering *can* in line 3 in comparison with the other lines involving modal verbs suggests it expresses a less tentative meaning of *could* in line 2 – where its co-occurrence with *well* makes the 'uncertainty' meaning particularly salient (Hoye 1996) – or *may* in line 4.

1	*Perhaps* she had been abroad, to Africa or something. That **would**	explain why	I didn't recognize her .
2	**Could well**	explain why	the Greek government is being so cagey.
3	If you can accept this concept, you will then be able to understand in principle why some people are predisposed to some illnesses. This **can** also	explain why	only some people on similar sorts of diet get sick and overweight, while others seem to stay slim and healthy
4	This **may**	explain why	low dose chenodeyxholic acid does not prevent gall stone recurrence

Figure 3.10. Examples of 'uncertainty' with [situation] + EXPLAIN + *wh*

In terms of the remaining 46 instances of [situation] + EXPLAIN + *wh*, there are 26 (positive) 'indicative' and 6 'negative' instances. There are a further 14 instances that are classed as 'other'; these all have related meanings in that part of the explanation is provided, for example, *X goes some way to explaining why*.

This section and Section 3.4.4.1 have attempted an exhaustive analysis of the

two senses of EXPLAIN *wh* to indicate how instances are distinguished with a particular focus on modal meanings. This begins to show how different meanings of verbs are associated with different modal meanings and the potential utility of the meaning frame as a way of investigating this.

3.4.5 Dealing with frequencies

The analysis for [source] + EXPLAIN + *wh* and [situation] + EXPLAIN + *wh* shown above indicates how each verb in the sample was handled in terms of modal and non-modal instances. That is, the various exponents of modal meaning that were identified in the concordance lines were organised as far as possible in terms of the types of expression they fit into. As we have seen, some of these necessitated sub-categorisations of the initial types, or were classified as 'other'.

The instances identified for each verb could then be added to instances from the relevant meaning frame and recorded, building up a picture of the types and exponents of modality that are associated with that meaning frame. Thus, the instances for [source] + EXPLAIN + *wh* with obligation meanings, for example, could be included with those for other verbs with in the same frame, [source] + [describe] + *wh*, such as DESCRIBE, SAY and SPECIFY.

Since all analyses are based on samples of 300 lines (or fewer in the case of verbs which did not have as many **V wh** instances in the BNC), a raw count of instances will distort the picture, based on the fact that different verbs have

different overall **V wh** BNC frequencies. Using the example of [source] + [describe] + *wh*, the frequencies found for the verbs just mentioned are as shown in Table 3.13 where we can see that SAY is 24 times as frequent as SPECIFY. In counting their respective instances, some account needs to be made, therefore, for the overall BNC frequency. This is done by extrapolating from frequencies found in samples based on frequency in the BNC as a whole (Hoffman et al. 2008), except in the case of SPECIFY and other verbs with fewer than 300 instances, where all BNC instances are accounted for anyway.

Table 3.13. Overall BNC **V wh** frequencies for four [source] + [describe] + *wh* verbs

Verb	V wh hits
specify	220
describe	805
explain	2898
say	5298

The extrapolation calculation can be shown for EXPLAIN *wh.* On the basis that there are 2898 'surface' **V wh** hits in the BNC[1], raw frequency counts are extrapolated by calculating the proportion in the sample by dividing by 300 and then multiplying by 2898. Thus, the extrapolated frequency of all instances of [source] + EXPLAIN + *wh* based on the raw frequency of 225 is 225/300 * 2898, or 2173.5, while for [situation] + EXPLAIN + *wh*, it is 68/300 * 2898, that is, 656.9. The BNC is just one of many corpora, which are of varying sizes. In order to compare frequencies in

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[1] using the query:
(explain_VVI|explain_VVB|explains_VVZ|explained_VVN|explaining_VVG|explained_VVD)
(who|what|where|why|when|how|whether|if|whose|whom|which)

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different corpora, a normalised calculation needs to be applied and this normalisation figure chosen (per thousand words, per million words) will vary depending on the frequency of the phenomenon studied (Hunston 2002, Hoffman et al. 2008). Since in many cases we are dealing here with relatively high frequencies, the normalisation figure chosen was per million words (pmw). This figure is calculated by dividing the frequencies found by the size of the BNC in BNCweb in millions of words (98.313429). For [source] + EXPLAIN + *wh*, this gives 2173.5 / 98.313429 = 22.1 hits pmw, while for [situation] + EXPLAIN + *wh*, this calculation is 656.9 / 98.313429 = 6.68 hits pmw.

Carrying out these calculations for all the verbs sampled helps to redress the imbalance caused by taking samples of verbs of different frequencies. However, normalised frequencies alone may obscure associations found for certain verbs, particularly less frequent ones; normalised frequencies for SPECIFY, for example, will be low. For this reason, following the practice of e.g. Hanks (2013) and Stubbs (2001, 2006), associations for individual verbs in terms of percentages of their instances are also provided.

3.5 Methodology: conclusion

This chapter has given an overview of the methodology used in this study. Section 3.2 reported on the preliminary corpus-based study that provided evidence of an association between **V wh** verbs and markers of modal meaning (modal verbs and

to-infinitive). The issues relating to the preliminary study mentioned in Section 3.3 informed further, in-depth research into the types of modal meaning associated with **V wh** verbs. Section 3.4 then showed how 'true' *wh*-clauses were separated from false hits which were retrieved in the preliminary study due to the syncretism of *wh*-words. This was followed by a case study of the polysemous EXPLAIN *wh* to indicate firstly how the different senses of such verbs may be distinguished and secondly how the meaning frames, which are the subject of the next five chapters, were formulated. It was then shown how the types and exponents of modal meaning were identified with respect to the two meanings of EXPLAIN *wh* and how frequency information is calculated and will be reported in the following chapters.

The meaning frame is an important means of distinguishing meanings and grouping verbs according to commonalities of subject roles and verb meanings. The aim of the rest of this thesis is to test the idea that distinguishing the meanings in this way and investigating the modal resources that they attract can help to show how modal meanings vary according to meanings of verbs and help identify more specific phraseologies associated with them.

CHAPTER 4 – THE 'FINDING OUT' FRAME

4.1 Introduction

This chapter is the first of five chapters that investigate the types of modal expression associated with particular 'meaning frames', in this case [knowledge-seeker] + [find out] + *wh*. As discussed in Chapter 3, the notion of the meaning frame is an attempt to build on the commonly observed fact that **V wh** verbs can be divided into semantic sets, for example the 'ASK', 'THINK', 'DISCOVER' and 'SHOW' **V wh** meaning groups in Francis et al. (1996). The relative consistency of semantic groupings of these verbs across a range of studies suggests that verbs with similar meanings will share phraseologies, based on Sinclair's (1991) argument that meaning and form are associated. Where this study differs from previous analyses of verbs with *wh*-clause complementation is that the 'meaning frames' identified are an attempt to identify these phraseologies by considering the influence of different types of *wh*-clause (see Section 2.6.2) as well as the identity of the entity responsible for finding out, deciding, describing, knowing etc. the answer to the implicit *wh*-clause question.

The creation of these meaning frames enabled the investigation of the ways in which they are qualified by different types of modal meaning and thereby to investigate specific exponents of modal meaning. Since the argument here is that modal expressions including modal verbs are liable to phraseological constraints

(Hunston 2000), it is important to consider which modal expressions and meanings are associated with which meaning frames. This meaning frame is the first one dealt with as it is the most fruitful in terms of modal expressions.

4.2 Overview of the meaning frame [knowledge-seeker] + [find out] + *wh*

This section will outline the decisions that led to the formulation of the meaning frame [knowledge-seeker] + [find out] + *wh*, instances of which refer to situations in which an entity is actively engaged in ascertaining information. Table 4.1 shows analogous groups in the literature as well as the verbs which have senses which are included in this meaning frame. Although, as the notion of 'meaning frame' implies, a simple list of verbs is an inadequate summary of the phenomena involved, it provides a means of comparison with earlier studies.

Table 4.1: Overview of 'finding out' verbs in previous studies

study	meaning groups	example verbs
Karttunen (1977)	verbs of acquiring knowledge	*learn, notice, find out, discover*
Francis et al. (1996): V wh pattern	DISCOVER	*ascertain, assess, check, decide, determine, discover, establish, figure out, find out, guess, hear, investigate, judge, learn, notice, realize, recognize, see, (can) tell, work out*
Francis et al. (1996): V wh-to-inf pattern	DISCOVER	*ask, assess, check, determine, discover, establish, figure out, find out, guess, investigate, learn, see work out*
Biber et al. (1999)	discovery[1]	*ascertain, determine, discover, establish, figure out*
Trotta (2000)	Knowledge/Cognition	*discover, figure out, find out, know*
Huddleston & Pullum (2002)	Knowing	*know, find out, remember, discover*
Current study	[knowledge-seeker] + [find out] + *wh*	*ascertain, check, determine, discover, establish, figure out, find, find out, hear, investigate, learn, see, work out*

[1] This is a subgroup of 'Cognition verbs' (Biber et al. 1999: 688)

As we can see, what emerges quite clearly from previous classifications is a general agreement that the verbs listed have something to do with either *knowledge/cognition* or *discovery/acquiring knowledge*. Francis et al. (1996) also include verbs relating to deciding or judgement such as ASSESS, DECIDE and JUDGE. The concordance analysis carried out in this study makes an attempt to consider not just the verbs but also the types of *wh*-clause and the roles of the entities involved. On this basis, it is possible to make distinctions between 'finding out',

'knowing' and 'deciding/judgement'. These distinctions can be illustrated by considering two of the polysemous verbs which have been included in this meaning frame, SEE and DETERMINE. These two verbs have been chosen because they also illustrate the issues encountered with HEAR and ESTABLISH, respectively.

On the basis of concordance analysis of samples of SEE *wh*, I discerned two main senses, which might be glossed as 'find out' and 'understand' (lines 2 – 3 and 5 – 6 of Figure 4.1, respectively). These different senses are associated with different features which coincide with those which underlie the distinction made here between the meaning frames [knowledge-seeker] + [find out] + *wh* and [knower] + [know] + *wh*; lines 1 and 7 are provided as examples of monosemous verbs from the respective meaning frames. Lines 1-3 display the following features: all the *wh*-clauses are 'genuine', that is the entity involved does not know what the answer to the implicit question is; the 'seeing' appears to entail some kind of effort on the part of the person involved, either by virtue of other verbs in the co-text (*looked, were checking*; *investigating*) or the form of SEE itself (*carries on investigating … and seeing how*). In contrast, instances of SEE *wh* that have been classed with [knower] + [know] + *wh* show some of the following features identifiable in lines 5 - 7: *wh*-clause types that are not genuine questions, such as line 6, which is a *wh*-exclamative; the paraphrase by the interlocutor of 'see' as 'understand' in line 5. In short, the examples of SEE *wh* illustrates the difference between 'finding out' and 'knowing' instances based on concordance analysis of the samples of **V wh** verbs. It also shows that this distinction is not always

completely clear in that line 4 appears to be near the boundary between the two senses.

1	She looked round swiftly to	check whether	the others had seen him
2	Pascoe looked around the room as though he were checking to	see whether	he 'd left anything behind . He said , [Lots of luck , Charlie .]
3	She carries on investigating her new present and	seeing how	it works.
4	The substantial remains of this cavalry fort include the bath house, where you can still	see how	the underfloor heating system worked.
5	A- You see this is why I want the management committee because I don't really want to bother of interviewing somebody else and getting somebody else, do you	see what	I mean ? B - No, no, I understand that, but I was thinking you, to me it sound as though you sort of given her warning and [unclear] .
6	What could she say ? She suddenly	saw how	selfish she had been
7	He suddenly	realised how	close he was to her .

Figure 4.1: Examples of different senses of SEE *wh* and comparable instances of CHECK *wh* and REALISE *wh*

The other polysemous verb included in this meaning frame which can help clarify the distinctions made between meaning groups is DETERMINE *wh*. Figure 4.2 presents some examples of this verb from the sample as well as examples of CHECK and DECIDE for purposes of comparison. This study finds three different senses of DETERMINE *wh* which link it to the meaning frames [knowledge-seeker] + [find out] + *wh* (lines 1-4 in Figure 4.2), [decider] + [judge] + *wh* (lines 5-7) and [factor] + [determine] + *wh* (line 8). The first distinction, between 'finding out' information and 'judging', hinges on whether the entity responsible for determining

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has some control over the answer or not. The *wh*-clauses in instances of DETERMINE *wh* classed as [decider] + [judge] + *wh* either involve a marker of obligation such as *should* (line 6; see also line 5) or refer to the same entity that is making the decision (*the panel … you* in line 7). Such features are absent in instances of DETERMINE *wh* classed as [knowledge-seeker] + [find out] + *wh*. The examples also illustrate how the distinction in terms of *wh*-clause is associated with the entities involved; while in lines 5-7 reference is made to some kind of authority such as *the Director General* or *the panel*, lines 1-3 show that instances of DETERMINE *wh* classed as [knowledge-seeker] + [find out] + *wh* involve entities involved in research. Line 8 is included as an example of DETERMINE *wh* which this study classes in the meaning frame [factor] + [determine] + *wh* on the basis that the entity that 'determines' here (*the nature of the relationship*) is inanimate and therefore is in a different relationship with the *wh*-clause (see Section 8.4).

1	it is important to run tests to	check which	pattern is the most suitable for the particular picture
2	Objective -- To	determine whether	birth weight and gestational age are associated with respiratory illness and lung function in children aged 5-11 years.
3	Further studies will be necessary to	determine which	factor -- the ulcer crater or H pylori -- is reponsible for the increased basal acid output.
4	Contact your local authority to	determine what	their plans are and press for a coherent strategy that includes maintaining community and voluntary sector initiatives .
5	Last year the Countryside Commission called for an inquiry to	decide whether	recreational vehicles should be banned on Sundays and Bank Holidays on the stretch between Streatley in Berkshire to Overton Hill .
6	A Water Service Company may at any time require the Director General to	determine whether	, and if so how, K should be changed.
7	And the county council feels that it has adequately addressed the needs of the districts within the county, erm obviously that 's up to the panel to	determine whether	you agree with that
8	But it is the nature of the relationship between Belfast and Dublin that will	determine whether	Sir Patrick is successful in making real headway against the IRA.

Figure 4.2. Examples of the different senses of DETERMINE *wh*

In summary, the instances here classed as 'finding out' construe the finding out of

an answer as a dynamic *process* involving an agent - here termed the 'knowledge-

seeker' - who is seen as in a position to, or wanting to, take action to resolve the

wh-clause question but not in control of the answer. Typical of models based on

authentic language data, this characterisation is able to cover core instances but

encounters some difficulty with instances that do not completely fit in (Cook 2006).

Thus, there is some overlap with both 'knowing' and 'deciding' frames.

The rest of this chapter will consider how different modal meanings are

realized with this meaning frame. First of all, it is helpful to consider an overview of the distributions of modal and non-modal meaning based on extrapolations which take into account **V wh** frequencies in the BNC (see Figure 4.3). Firstly, there is a very high proportion of instances of this meaning frame that are involved in some kind of modal meaning. Only around 15% of instances are either indicative, negative or 'other'. Secondly, we can see that a high proportion (around 46%) of instances are classed as related to 'volition/purpose'; this is accounted for by a high association of this meaning frame with infinitive of purpose. Both permission (just over 1%) and uncertainty (just under 4%) have quite low frequencies.
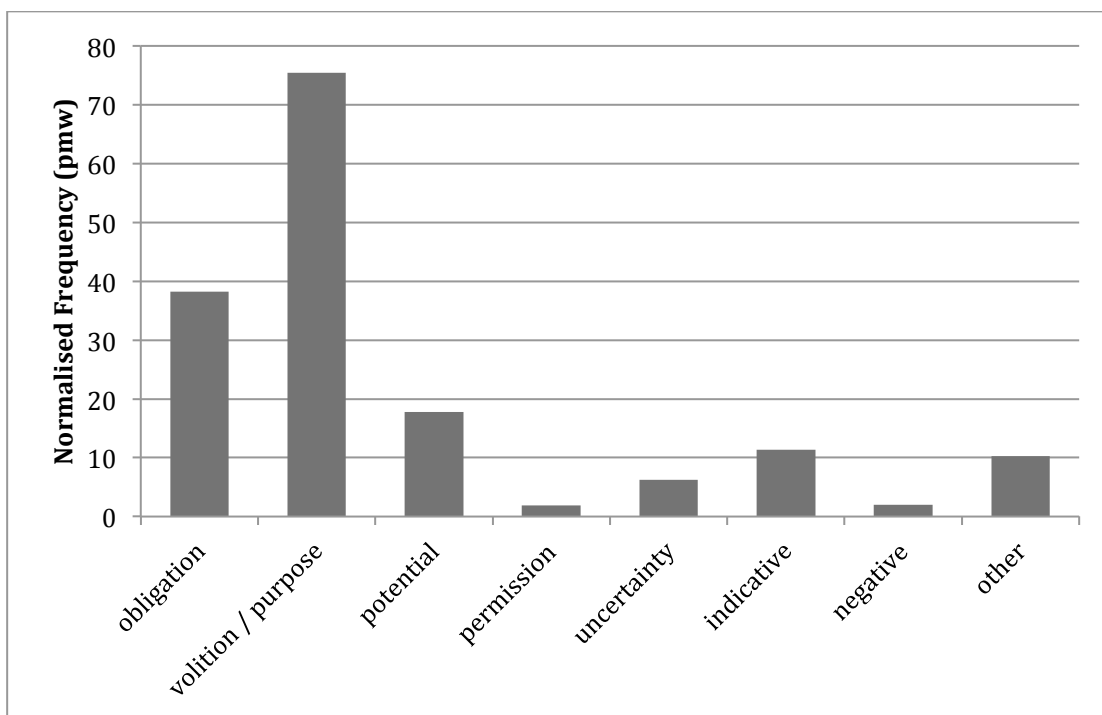
Figure 4.3. Distributions (pmw) of modal and non-modal meanings for [knowledge-seeker] + [find out] + *wh*

The following sections will discuss in greater detail the exponents found for each modal category shown in Figure 4.3, followed by a brief consideration of the other categories.

4.2.1 The expression of obligation with the frame [knowledge-seeker] + [find out] + *wh*

This section discusses instances of 'finding out' verbs with expressions of obligation. Figure 4.3 shows that on the basis of extrapolation from raw frequencies taking **V wh** frequencies into account, we get a normalised frequency of 38.2 hits

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pmw. As noted in Section 2.4.1, previous studies have proposed a range of resources that may express or report obligation but little is known about their relative frequencies. These are divided up as shown in Table 4.2 to take account of the identity of the agent who carries out the action, their role in the clause and whether the source of the obligation is identified.

Table 4.2. Typology of obligation expressions

Type	Main forms
imperatives, imperative-likes	imperative *you may want to*
modals	*must, should*
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*
existential	*it* BE [important] *to* *there* BE *a need to*
X ask Y to	X [ask] Y *to*
X BE asked to	X BE [asked] *to*
X's task to	*it* BE X's [task] *to*

Before looking at each type in turn, it is of some interest to consider extrapolated frequencies of the different types (see Figure 4.4). The main finding that stands out is the high frequency of imperatives (including *let's/let us*). It should be pointed out that this high frequency is largely attributed to the effect of one very frequent verb, SEE; 63% of the obligation instances of this verb in this sense are imperative. The next most frequent type of expression is modal verbs (also strongly influenced by SEE) and semi-modals. But we can also see that 'existential' obligation expressions are fairly well represented (around 11% of the total). The rest of this section will discuss these types, considering the verbs and phraseologies associated with the

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different types of expression.
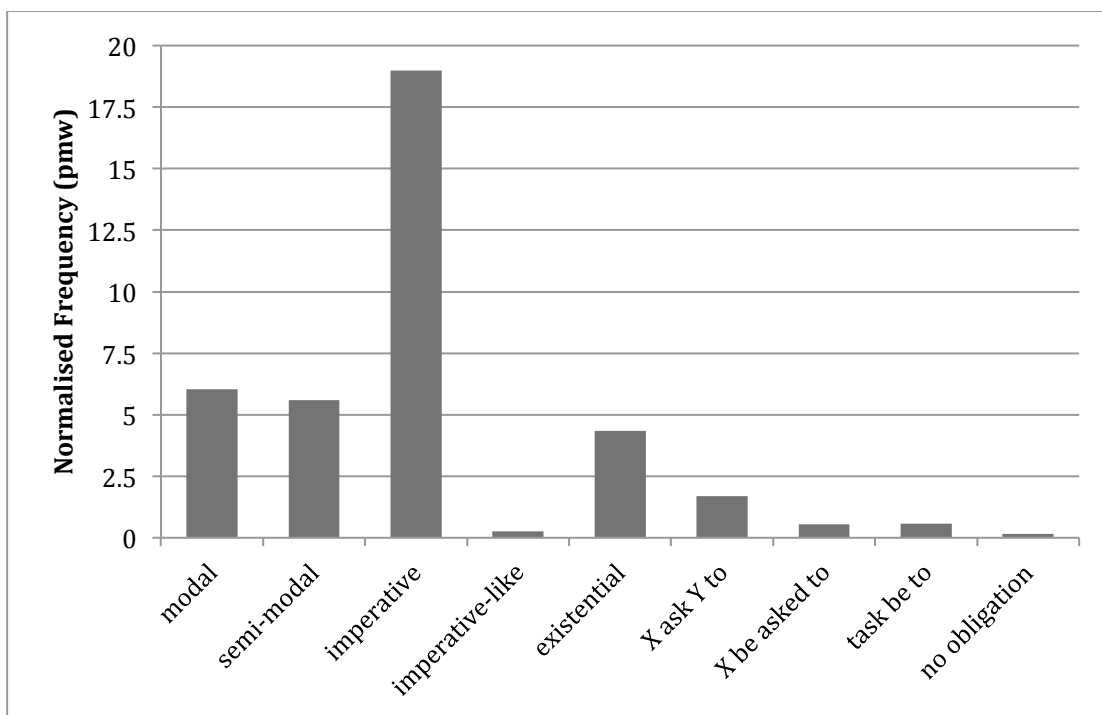
Figure 4.4. Distributions (pmw) of different means of referring to obligation for [knowledge-seeker] + [find out]+ *wh*

The first type of obligation expressions with [knowledge-seeker] + [find out] + *wh* (see Figure 4.5) group together those forms which have tended to receive the most attention in studies of modality: the modal auxiliaries *must, should, could* and *ought to* (around 6 hits pmw with this meaning frame) and the 'semi-modals' HAVE *(got) to* and NEED *to* as well as BE *to* and *had/'d better* (5.6 hits pmw). A majority of instances (65% of the extrapolated totals) involve *must, should,* HAVE *(got) to* or NEED *to.* All the 'finding out' verbs are found with the modals and semi-modals of

obligation, but LEARN (15% of all LEARN *wh* instances sampled), CHECK (9%) and FIND *out* (7.5%) are particularly associated with them.

The similarity between modals and semi-modals lies in the feature that they allow the full person system, with the subject referent as the entity that is under obligation (Halliday 1994). This similarity is most obvious when instances of the same person are juxtaposed, as in Figure 4.5. Other similarities in these instances can also be noted. With second person instances (around 18% of modals and semi-modals), we can note co-textual features which indicate that advice or instructions are being provided, most obviously other means of expressing obligation in lists (see italicised items in Figure 4.5) combined with other items that indicate lists (*first*, *also*). The use of NEED *to* or HAVE *to* allows the addition of a modal verb, as in line 4 which appears to be a use of *will* to soften the potential force of NEED *to* (see also line 7). It is interesting to note that the only modal verb used with semi-modals of obligation in this meaning frame is *will* (and one example of reported *would*).

Third person examples such as those shown in lines 5-10 account for around 34% of the total. Again, there are similarities between modal and present tense semi-modal uses; these are less direct than second person instances and perhaps more open to interpretation as an 'objective' deontic statement (Lyons 1977). Third person instances are more likely in semi-modal instances to be reported, for example past tense in line 9; 42% of third person semi-modal instances compared to 4% in the second person and 23% in the first person. Line 9 is of note since it

includes an example of BE *to* which only occurs around 0.2 hits pmw with this meaning frame. Almost all instances are of this type, where BE *to* is used to report that an entity has been given a responsibility by an unnamed authority or as the result of an official meeting. In this sense, BE *to* in terms of its use is close to both X BE [asked] *to* and X's [task] BE *to,* both of which are seen below.

First person instances make up around 48%; this can partly be attributed to the incidence of *had/'d better* (1.1 hits pmw), which is exclusively first person. Line 13 is an example of what Coates (1983: 35) calls 'self-exhortation' where the speaker proposes a course of action which they need to carry out; line 10 shows how first person obligation instances can act to advance an argument that a question needs to be answered before answering it in the following text (Van linden 2012). It is interesting to note that all first person instances with modal verbs involve *we* and are compatible with these analyses. *I* only occurs with semi-modals in this meaning frame; instances may emphasise a personal need (line 12) or that the situation is forced upon them (line 11).

1	*Look at* the question in Figure 2A; *you are asked to* work out the transfer price, but first you **must**	work out what	volume the group should operate at .
2	*You must* report a respiratory rate lower than 12 per minute , a tachypnoea or any abnormality... While observing the respiratory rate you **should**	check whether	both chest walls move equally and whether the accessory muscles of respiration are being used. *It is also important to* check the mucous membranes and lips for signs of cyanosis .
3	*First* of all, you **have to**	ascertain whether	your strategy up the first part of the beat will make you want to carry on sailing on starboard tack for some time after the starting signal
4	These are Card Nos 17, 18, 19 and 20 in the basic set of punchcards. You **will need to**	learn how	to interpret the curved and straight arrows
5	The building owner **must**	establish whether	the structure will provide an acceptable period of fire resistance in its unmodified state
6	The therapist **needs to**	find out how	often the problems are occurring and how extreme the behaviour is in order to assess the severity of the problem.
7	The parties to the scheme **will need to**	check whether	the target has any overseas shareholders.
8	This was a difficult decision as it meant a drop in their poor standard of living. They **needed to**	learn how	to play together and enjoy each other's company.
9	THE cross-party Commons public accounts committee **is to**	investigate how	accounting failures led to £21 million going missing from a fund used to provide loans to needy people.
10	*Before* asserting that the deceptive appearance of a grasshopper or butterfly is unnecessarily detailed, we **must** *first*	ascertain what	are the powers of perception and discrimination of the insects' natural enemies .
11	'The selectors have put me in the position where **I have to**	work out what	is right for my family and me.'
12	I **needed to** be nobody, to	find out how	ordinary people lived .
13	But by doing this we have changed the experiment and we **had better**	check whether	the result has also altered. In fact it has.

Figure 4.5. Examples of modals and semi-modals of obligation with [knowledge-seeker] + [find out] + *wh*

As noted in Chapter 2, imperatives (including *let's*) are an important means of

expressing obligation (Lyons 1977, Gabrielatos 2010, Huddleston & Pullum 2002). However, they are usually treated separately from modal verbs and semi-modals of obligation, so even in corpus studies of modality, relative frequencies are not given. From this point of view, it is interesting to note the high relative frequency of imperatives and *let's* with this meaning frame; *let's* accounts for around 30% of the imperative totals. This category is extended to include other expressions where the obliged party is restricted to the addressee, notably conventionalised ways of making requests or suggestions (Carter & McCarthy 2006, Adolphs 2008) illustrated by lines 7-9 in Figure 4.6. These are around 100 times less frequent than imperatives/*let's*. The 'finding out' verbs most associated with imperatives and imperative-likes are SEE, with just under 18% of its 'find out' instances being imperative, CHECK (13%) and WORK *out* (8%).

As the examples indicate, an imperative is almost invariably used when the addressee will gain some advantage from finding out the answer. This advantage may be gained by following a set of instructions (line 1), in which case the co-text makes it clear that we are dealing with instructions/advice by including features such as other imperative forms (*Try it* in line 1), items marking lists, or the problem to be solved (*Hot water too hot* in line 2); we can note the similarity in terms of features and meaning with second person instances of modals and semi-modals. Line 5 is an example of an imperative used in a request. In this sample, this use of the imperative is much rarer (only around 4% of imperatives were clear cases) and tends to be accompanied by items that serve to mitigate its potential directive force

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such as *will you* or *please*. One interesting finding from the concordance analysis was the use of imperative *try to* (line 3) and other imperative expressions with similar functions; *make a point of –ing* is listed (line 4), but also found were *go to the trouble of, take care to* and *take (the) time to*. Their similarity in function to imperatives can be seen in that they alternate with them (*find out* in line 3, *speak* in line 4). These 'expanded imperatives' only make up around 7% of imperatives (*try to* accounts for 85% of these).

1	Try it with your calculator,	see what	it comes to.
2	Hot water too hot	Check whether	an immersion heater thermostat is defective .
3	1 Find out the reasons for any request for spokesmen or filming facilities and **try to**	ascertain what	angle is to be taken .
4	So **make a point of**	checking if	the aid is on or off before talking to someone who wears an aid, and speak slowly and clearly, with your face clearly visible.
5	She rubbed a hand over her eyes. 'Phone the agencies, will you, and	see if	they can come up with someone, just in case?'
6	Meanwhile, **why not**	find out if	your local council or a local charity has a paper collection scheme?
7	Now **if you'd like to**	check what	Claire has got. Let's see what Claire 's got first of all .
8	Hello, it's Mrs [gap:name] here, I've just spoken to the other lady making a booking for three twin rooms. **Can you just**	check whether	they're en suite. They are ?
9	Shall we, just **let's**	see if	we can turn this round so it makes it
10	Hang on, **let's** just	check what	we 're doing with this .

Figure 4.6. Examples of imperatives and imperative-like constructions with 'finding out' verbs

In terms of imperative-like requests (lines 6-8 in Figure 4.6), we have already noted their relative infrequency. For this meaning frame, apart from the exponents shown

here, we also found *you may/might want/wish to* and *what you want to do is...* .

Lines 9 and 10 in Figure 4.6 provide examples of *let's* with this meaning frame; such instances have a clear association with 'self-exhortation' examples such as those mentioned above (e.g. *we'd better ...*) and co-occur with the same verbs (*see, check, learn*). Two instances of *shall we* were also found.

The next most frequent means of expressing obligation after modals, semi-modals and imperatives is existential expressions of obligation, with around 4.3 instances pmw. These objectify the obligation by stating its existence and they are therefore useful when one does not necessarily want to identify who is responsible for the action. The 'finding out' verbs most associated with these existential expressions are ESTABLISH (10% of ESTABLISH *wh* instances), ASCERTAIN (7.5%) and CHECK (5.5%).

Section 2.4.1 showed that previous studies have identified two main types of existential expression of obligation. The first of these is introductory *it* expressions, which it was suggested could be represented as *it* BE [important] *to/that*. This is the most frequent type of expression of existential obligation, with 2.9 instances pmw. Although the literature tends to give equal prominence to *to*-infinitive and *that*-clause complementation (e.g. Perkins 1983, van Linden & Verstraete 2011), it is noteworthy that only around 3% of these instances involve *that*-clause complementation[1].

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[1] only one instance was found with the prepositional phrase *for X* identifying who is supposed to carry out the action

1	**It is** normally also **necessary to**	check whether	the investments themselves qualify for the exemption
2	**It was** also **important to**	establish whether	adults would use deductive markers in these contexts, and so a written version of the tasks was given to a group of undergraduates .
3	In some cases of damage **it might be wise to**	ascertain whether	or not there was any similar damage prior to the accident .
4	6 . If you are dealing with, and are dependent on, several big customers, **it is worth**	finding out how	and when they pay their debtors, and then fitting in with their procedures .
5	It will **be interesting to**	determine whether	species and if the class defined by this divergent zebrafish POU protein also contains other members
6	**There is a clear need to**	investigate whether	the assumptions upon which econometric models are based are consistent with empirical data.
7	**It was time to**	find if	I had managed to stay within my budget .
8	As a simple example, let us take a large pipe break in the primary cooling system. **The first step is to**	determine which	system might affect the subsequent course of events
9	**The fourth point is to**	check whether	your choice of a particular subject calls for any prior knowledge or qualification

Figure 4.7. Examples of [knowledge-seeker] + [find out] + *wh* with existential expressions of obligation

Anticipatory *it* expressions with 'finding out' verbs can be divided into 3 main groups. Lines 1-2 in Figure 4.7 show examples of adjectives meaning 'important' (around 26% of introductory *it* instances); *important* and *necessary* are involved in 90% of instances, but *vital* and *urgent* are also found. Variations include use of the link verb SEEM instead of BE, and the addition of *try to* (only 2 cases); 'important' instances only combine with the modal *will* (or reported *would* - 1 case) in this sample. Lines 3 and 4 show weaker obligation examples (29%); apart from *wise to*

and *worth –ing*, which are the only repeated forms (around 25% of instances), a range of items were noted: *advisable, best, useful, natural, common sense* and *not such a bad idea*. The modals found to co-occur with these weaker items (only around 5% of the time) are *may, might* and *would*. The third group, exemplified by line 5 (39% of instances), involves 'interesting' items which include *intriguing* (1 instance) and *of (considerable) interest* and which almost invariably co-occur with modal verbs (*will, would, should*). The minor, related introductory *it* expression *it* BE *time to/that* (line 7), accounts for just under 6% of instances.

The second type of expression involves existential *there,* in *there* BE a (*clear/urgent/vital*) *need to*. This is much less frequent, at 0.1 hits pmw. An example of this is seen in line 6.

Examination of the concordance lines for 'finding out' verbs suggested a further existential expression, *the/a/one* [step] BE *to*, with 1.1 hits pmw. Two examples are seen in lines 8 and 9. As the form itself suggests and the examples indicate, this expression is used where an approach, or a series of steps, is suggested for solving a problem of some kind or deciding on a course of action. It recalls similar uses with imperatives and second person modals/semi-modals (see the first lines of Figures 4.5 and 4.6). Although *step* is found in around 11% of instances, no noun predominates; also included in similar instances are *thing, task, approach, course, move, approach, way, guide* and *strategy*. We can note that all of the examples in Figure 4.7 either involve suggesting a course of action in a particular situation which could be construed as advice, perhaps in a list of other

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similar items (see lines 1, 4, 8 and 9), or seem to amount to a justification of action undertaken, about to be undertaken or which seems to be planned in the future (lines 2, 5, 6, 7).

As noted in Section 2.4.1 a number of lexical verbs of obligation are noted in the literature in particular in the pattern **V n to-inf** (Francis et al. 1996); these include URGE, ADVISE, WANT (Halliday & Matthiessen 2004: 627), REQUIRE, OBLIGE (Quirk et al. 1985) and INVITE and ORDER (Perkins 1983). A distinction is made between active instances, represented by X [ask] Y *to*, where the source of the obligation is explicitly named, and passive X BE [asked] *to*, where this source is not identified. On this basis, it was possible to identify examples of these two expression types in the first instance by isolating exponents of the grammar pattern, although, as indicated below, there were other, more marginal instances. Neither of these expression types is particularly frequent with this meaning frame; X [ask] Y *to* extrapolates to around 1.7 hits pmw and X BE [asked] *to* to around 0.6 hits pmw. The 'finding out' verbs most associated with these expressions are INVESTIGATE (9% of its **V wh** instances) and ASCERTAIN (6%).

Some examples of X [ask] Y *to* instances are provided in Figure 4.8. A wide range of verbs was identified: WANT, WISH, REQUIRE, INSTRUCT, ADVISE, GET, CALL *in/on*, FUND, COMMISSION, APPOINT, SEND, RECRUIT, PAY and INVITE. Of these only ASK, REQUIRE (3 instances), APPOINT (2) and SEND (3) occur more than once; nearly half (47%) of instances involve the verb ASK. At the same time, it seems possible to group instances together involving the lexical set of verbs that broadly refer to

being paid or employed to complete a task (*instruct, appoint, fund, commission, send, recruit* and *pay*); an example of this phraseology (which accounts for around 30% of instances) is shown in line 4. This is an interesting grouping since these verbs would not normally be associated with reference to obligation. They follow the general pattern of reporting an obligation (task) imposed on a third party (around 95% of instances). An exception is line 1, which imposes the obligation in what Halliday (1994) refers to as 'explicit subjective obligation'. Instances such as line 5, where there is reference to an authority such as *British Rail* (government bodies, or politicians) starting an *investigation*, *task force*, or *meeting* were also included on the basis that the investigation is shown as having responsibility for finding the answer to the question. These make up around 13% of the total of 'asking' expressions.

1	More than that, I **want** you **to**	find out what	they could be used for
2	The plaintiffs' case was that Peats and Coopers had made mistakes of mixed fact and law, and that they were entitled to **ask** the court **to**	determine whether	or not Coopers had made those mistakes .
3	The human rights organization Amnesty International then **called on** the government **to**	investigate whether	human rights had been violated , and a presidential commission accordingly set up recorded allegations of torture from nine of the 13 detainees
4	Sir John put the wine cup down. 'When I was in London I **paid** people **to**	ascertain if	the Templar church near Fleet Street contained anything resembling the River Jordan or the Ark of Moses.'
5	BRITISH Rail **has launched** an investigation **to**	discover how	a herd of cows came to be wandering down the Saltburn-Darlington line last week

Figure 4.8 Examples of 'asking' expressions with [knowledge-seeker] + [find out] + *wh*

As noted above, far fewer instances of the passive X BE [asked] *to* were found than its active form. The verbs found were *advised, ordered, told, called in/on, charged, required, asked, expected, encouraged, sent* and *left*; only *advised, required* (3 instances each), *sent* (4) and *asked* and *left* (2) occurred more than once. Again the majority of instances (over 90%) report the obligation, as in line 1; an exception can be seen in line 2 of Figure 4.9, where present tense is used to show that the obligation is live. Instances such as line 3, involving reference to an *inquiry*, *investigation*, *committee*, *conference* or *research project* being established to find out information have been included in this sequence; these entities are interpreted as being under responsibility to find out the information.

1	Local authorities **were** also **required** to provide books and stationery [...] and to	ascertain which	children in their areas required special education, and provide special schools as necessary.
2	Similarly expatriates **are advised to**	check whether	the furnished property includes crockery, cutlery, etc.
3	They added that a full inquiry would be **set up to**	investigate what	happened .

Figure 4.9. Examples of X be [asked] *to* with 'finding out' verbs

Instances such as those shown in Figure 4.10 exemplify two associated expression types: X's [task] BE *to* (lines 1 and 2) and *it* [be up to] X to (lines 3 and 4). These both draw attention to the responsibility or obligation that is part of a job, status or a shorter-term task; they also invariably identify *whose* responsibility it is. They are also very infrequent, both occurring in total around 0.23 times pmw. As the

examples suggest, *task* is the noun most often found in this sample (around half of the instances); other nouns found are *role, duty* and *responsibility*. The final line of Figure 4.10 shows HAVE *an obligation to*, another means of referring to an obligation. Like the other expression types here it might be considered a subcategory of existential expressions of obligation in that it is very similar since present tense instances like this can be seen as a more indirect way of saying 'he should/must'.

1	Brain teaser [...] Your **task is to**	work out which	letter represents which number. To give you a start, K=3.
2	**It is one of the tasks of** the inquiry by the West Yorkshire Police, supervised by the authority, **to**	discover how	many of the 754 arrests by the squad since January 1986 may have resulted in convictions from fabricated confessions.
3	Boy assumed that **it was up to** him **to**	find out if	these bars were closed [...] or were simply too expensive for him to visit
4	St William's has presented itself as a prime mover and so **it falls to** St William's **to**	work out how	to express itself as a managing agent .
5	He **has an obligation to**	determine whether	it is in order.

Figure 4.10. Examples of 'task be to' expressions with [knowledge-seeker] + [find out] + *wh*

Lack of obligation is generally infrequent with **V wh** and in particular very rare with this meaning frame; less than 0.5% of instances were found to refer to lack of necessity. Two examples are shown in Figure 4.11 both of which report the lack of obligation in the past, implying that the finding out did not take place.

1	okay so that was easy you **didn't have to**	work out how	many degrees, it was just a half, it's half way round the circle.
2	In the context of the present case, however, **it was not necessary to**	determine whether	there were any conceivable circumstances in which Community law might affect rules in that sphere laid down by a member state.

Figure 4.11. Examples of lack of obligation with [knowledge-seeker] + [find out] + *wh*

The picture that emerges from this analysis of the meaning frame [knowledge-seeker] + [find out] + *wh* when it is qualified by items expressing obligation is a complex one. All the 'finding out' verbs are associated with expressions of obligation, but certain verbs have preferences for particular expression types, e.g. SEE for imperative and ASCERTAIN and ESTABLISH for anticipatory *it* expressions.

4.2.2 The expression of volition and purpose with [knowledge-seeker] + [find out] *wh*

This section discusses and those instances of the meaning frame [knowledge-seeker] + [find out] + *wh* with expressions of volition or purpose. In other words, the instances surveyed here present an entity as having some desire to find out information, whether or not this desire is actually acted upon. As shown in Figure 4.3, expressions of volition/purpose are by far the most common way of qualifying this meaning frame.

Section 2.4.2 surveyed some realizations of volition and purpose that have been noted in the literature, indicating how they might be grouped and indicating

how they relate to volitional *will*. Table 4.3 presents the types, all of which are attested with [knowledge-seeker] + [find out] + *wh.* From the perspective of how forms beyond modal verbs and semi-modals complement their meanings, in terms of volition, there is a difference in terms of commitment between *will* and the other realizations, which tend to acknowledge the possibility of failure to a greater extent. Expressions of purpose, meanwhile, refer to goal-directed activity which is undertaken without guarantee of success.

Table 4.3. Typology of expressions of volition & purpose

Type	Main forms
modals, semi-modals	*will, would,* BE *going to*
willing to	X (BE) [willing] *to*
wanting	[want] *to*
aim be to	the [aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose	*(in order) to*

Figure 4.12 shows the distribution of the different means of referring to volition and purpose with this meaning frame based on extrapolations from the sample of **V wh** verbs. What is clear from this is the clear influence of 'purpose' instances on the overall frequency of volition and purpose; no other meaning frame is so associated with purpose clauses. We can also see that modals and semi-modals of volition,

'wanting' verbs and 'trying' expressions are relatively frequent.
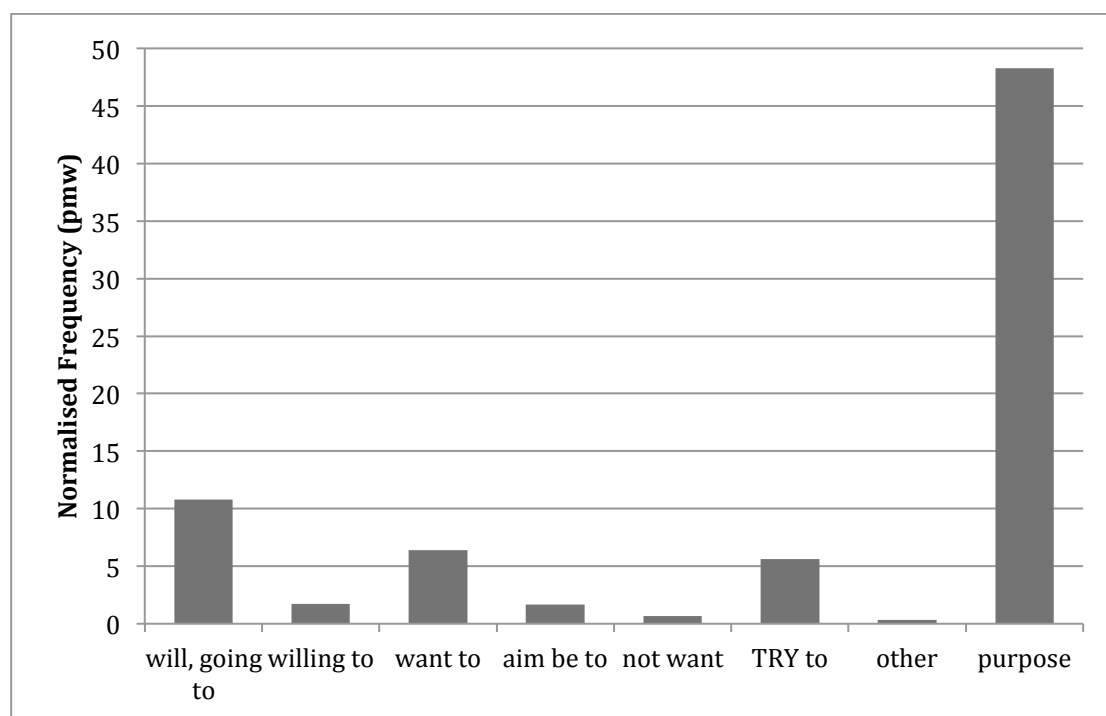
Figure 4.12. Distributions of types of volition and purpose expressions with [knowledge-seeker] + [find out] + *wh*

The examples in Figure 4.13 include instances of modals *will, would* (there is only one instance of *shall* in the sample) and the rarer semi-modal BE *going to* (around 11% of instances) which extrapolate to around 10.8 hits pmw with this meaning frame. Both Coates (1983) and Collins (2009) note the predominance of first person instances with the volitional meanings of these forms and we can note similar findings. In 76% of cases, the writer or speaker is the person expressing commitment to finding out missing information; in such cases, *see* and *check* are found more than other verbs.

1	Yeah I'll I**'ll**	check what	I've got booked where and then I'll I'll get in touch you for next week.
2	Right, right and er, I said well look I'**ll** have a word with the erm, with and	see if	he can think of anything that might Yes alleviate the point
3	We **will** investigate the circumstances with the RUC, and	check whether	the officer concerned is mentally and emotionally stable .
4	And Margaret said: 'I**'m going to**	find out what	a bestseller might bring in. Just for interest's sake.'
5	The project **will**	investigate how	information about such expectations and values could usefully be made available .
6	Additionally, the Board **will**	investigate how	it can help in the development and distribution of GNVQs, possibly through cooperation with other awarding bodies.
7	Rose ignored this. 'And the solicitor **will**	find out what	s going on. He says he has good relations with the police.'
8	One lot of housebreaking must be followed by another. I **would** enter the house opposite, and	determine whether	Victor was still about or not.

Figure 4.13. Examples of modals and semi-modals of volition with [knowledge-seeker] + [find out] + *wh*

This commitment to future action may be either direct, in first person instances, or indirectly, by reference to their own study or investigation. The latter instances (see line 5) only represent a very small proportion (around 1% of the total) but are very conventionalised; all but one of these instances involve the verb INVESTIGATE as part of the phraseology *the/this* [project] *will* [investigate] *wh*: other nouns found are *research* and *study*. Where the inclination of a third party is at stake, instances with personal pronouns *he, she* or *they* show the same association with *see* and *check* seen with first person instances. Where the third party is named or given a title (lines 6 and 7) or refers to an *investigation* or *inquiry*, the verbs occurring are either *establish, investigate, determine* or *discover*. The verb *find out* is found in both

situations. Line 8 shows a rare (only 2% of instances) use of *would* to report a past intention, a use also noted by Coates (1983).

As noted in Chapter 2, a number of studies have noted the use of adjectival expressions of volition such as *be happy/anxious/keen to*. Figure 4.14 shows examples of expressions based around the phraseology X BE [willing] *to* which is based on these adjectival expressions and was found to occur with this meaning frame at a frequency of around 1.5 hits pmw. The adjective found most frequently is *interested* (just under 18% of instances); other adjectives are *curious, prepared, motivated, determined, keen, anxious, concerned (about / to), happy* and *intrigued* as well as the related BE *out to*. In terms of 'finding out' verbs, there are no strong associations due to the low overall frequency, but, as the examples suggest, *hear, learn* and *find out* (also *discover*) are more associated with this expression type.

1	There's copies of the teams on the board there. I**'d be interested to**	hear what	you think.' 'I'll have a look.'
2	I **am particularly keen to**	learn whether	readers believe the employment of these cricketers has benefited the English game at domestic and national level .
3	The alarm came first from Belmodes. Gabriel came in early, **anxious to**	find out what	the police team had done the night before.
4	Now it only increased his **determination to**	find out what	had made her so wary, so controlled.

Figure 4.14. Examples of X BE [willing] *to* expressions with 'finding out' verbs

The concordance analysis also found related nouns such as *determination to* (see line 4 in Figure 4.14) and *interest*, but these are even less frequent (0.26 hits pmw). Both present (lines 1-2) and past (lines 3-4) instances are noted, though past

instances are more frequent, with around 60% of instances.

A more prevalent way (6.4 hits pmw) of referring to volition or inclination is by using a 'wanting' verb, such as those shown in bold in Figure 4.15. The verbs included in lines 1-10, with the exception of *would/'d like*, are listed by Francis et al. (1996: 91-92) as exponents of the **V to-inf** pattern, either in the 'promise' ('concerned with being committed to a future action') or 'hope' ('concerned with attitudes towards a future action or event') groups. This focus on 'future' action is also noted by Givon (2001: 308) in his reference to the 'forward projecting' nature of intention.

It is possible to divide these verbs into two main groups based on the 'finding out' verbs that they co-occur with in this sample. The first group, *'d like to* and WANT *to* accounts for nearly 70% of instances; WANT *to* is a little over twice as frequent as *would like to*. These two forms are the only ones to co-occur with *hear*, *see, check* and *work out* and account for nearly all the instances of *learn*; around 70% of these instances are either first or second person. The second group is represented by the verbs AIM, SET OUT TO, WISH, SEEK, INTEND and HOPE (listed in order of decreasing frequency) and accounts for around 24% of the total. Although there is an element of overlap – particularly with the verb *find out* – this second group of verbs co-occurs with verbs avoided by WANT *to* and *would like to*: *ascertain, discover* and *investigate*. Around half of the instances with this group of verbs are with non-human subjects such as those italicised in lines 7, 8 and 10. This is a tendency that is particularly pronounced with AIM *to*, which, like the phraseology *the/this* [project]

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will [investigate] *wh* noted above, is associated with the verb *investigate*.

1	**I'd like to**	hear why	you're on the run. I wonder was it because someone sent you a letter?
2	We just **wanted to**	check whether	there was anything new before we went over there.
3	This method is therefore the one to use if you **want to**	work out how	the pattern should be placed for matching side or raglan seams, cardigan fronts and so on.
4	While they are on view he **hopes to**	establish which	of the pendants are genuine, which of them are fakes and what are the distinguishing factors.
5	Detectives who **seek to**	establish what	happened come up against serious cognitive obstacles.
6	He **wishes to** interpret substantive cases and	find out what	they mean in relation to their social context .
7	*The research* **aims to**	ascertain whether	or not there is general satisfaction with existing legal forms among small businesses
8	In particular, through an examination of 5.000 objections to 25 local plans, *this research* **will seek to**	discover whether	good professional representation and actual appearance at an inquiry improves an objector 's chances of success.
9	It has been reported that the c-Jun oncoprotein is a substrate for the DNA-PK (9). We **set out to**	establish which	region(s) of c-Jun is phosphorylated by this kinase .
10	*This study* **aimed to**	investigate whether	the resistance to acid of the duodenal mucosa can be modulated by the dietary content of fatty acids .
11	This project **will** also **be** primarily **addressed at**	discovering how	we recognise voices .

Figure 4.15. 'Wanting' expressions with [knowledge-seeker] + [find out] + *wh*

Line 11 in Figure 4.15 is an example of a related subset of volition verbs followed by prepositions which emerged in the course of the concordance analysis. This is a minor group, with less than 5% of instances; all are passive forms. Apart from BE *addressed at*, there were instances with BE *focused on*, BE *directed to*, BE *geared towards* and BE *concerned with.* The subjects in all cases refer to research or

research instruments.

The examples in Figure 4.15 to some extent show how instances involving these 'wanting' verbs reduce the level of commitment compared to modals/semi-modals *will, would* and BE *going to*, allowing greater scope for the possibility of not achieving the desired aim (compare e.g. *he hopes to* with *he will* in line 4), which may be useful in situations where one does not want to make claims that are too strong (line 7). However, the use of these verbs also adds a more explicit evaluation of the subject referent's intentions compared to a modal verb, allowing them to be characterised as hopes, wishes, plans and so on.

A less frequent phraseology for the expression of volition is of *the* [aim] (*of the* [project]) BE *to*, with around 1.7 hits pmw; examples are provided in Figure 4.16. This is partly because the verbs most associated with this phraseology (and with the verb AIM *to*), *investigate* (around 9% of this verbs total **V wh** instances) and *discover* (6%), are themselves less frequent. *Aim* is by far the most common noun found (45% of instances); *purpose* and *objective* are also found around 12-13% of instances, and there are a few instances each of *object*, *task*, *intention*, *question* and *quest*. There is about an equal likelihood of reference to a past or a present aim or intention, and in nearly 60% of cases the aim in question is explicitly that of a *study, research, investigation, project, analysis* or *experiment*; this is a useful phrase to focus on the research rather than those involved in it. Line 5 is one of a few related instances (3% of the total) that refer to research aims; these are all of the form *the study/project etc.* BE *set up/designed to*.

1	The **purpose** of this research project **is to**	discover why	lone parent poverty rates vary across countries: is it simply that some transfer systems are more generous ?
2	The **aim** of the proposed research **is to**	investigate how	the subsidiary skills relate to the development of braille reading
3	**Objective** -- To	determine whether	birth weight and gestational age are associated with respiratory illness and lung function in children aged 5-11 years.
4	The **object was to**	discover if	ways could be found to make it easier to live with.
5	The project **was designed to**	establish whether	representation affected the outcome of tribunal hearings

Figure 4.16. Examples of [aim] BE *to* expressions with 'finding out' verbs

As noted in Section 2.4.2, it was decided to separate items related to 'trying' –
mainly the verb TRY and the noun and verb ATTEMPT followed by infinitival
complements – from those associated with volition and intention such as WANT *to*.
These forms not only express intention but also implicate some kind of goal-
oriented action and are therefore related to 'purpose' instances. The examples
provided in Figure 4.17 indicate that 'trying' words are used with 'finding out' verbs
to emphasise not just action but also some effort or difficulty, as indicated not just
by the italicised items but also by the preference for *-ing* forms (around 70% of
verbal forms), suggesting duration of effort. Two 'finding out' verbs show strong
associations with 'trying': *figure out* (28% of all **V wh** instances) and *work out*
(14%).

While TRY *to* is the most common way of reporting that effort was made
(nearly 70% of instances), other forms are used; line 5 shows STRAIN *to* (*hear*), but
the data include TAKE *steps to* and GO *to (great) lengths to* (in total less than 10% of

instances)*. ATTEMPT *to* is found as a noun and a verb, both accounting for around 10% of instances. It is associated with different verbs from TRY: *determine, discover* and *establish*. As a noun it is used in phrases such as MAKE *an attempt to* or *in an attempt to* (see line 7). Using the noun also allows the *attempt* to be characterised as, for example, *concerted* (line 6) or *serious*.

1	He undertook the *huge task* of searching into Coleridge's past and **trying to**	find where	the images of his poetry came from .
2	The judge has declared the original decision illegal,' said a Trade and Industry insider last night. 'Now, everyone **is trying to**	work out what	that means .
3	Veronese's monumental 'The Marriage at Cana' in the Louvre was seriously damaged when curators **tried to**	check whether	it was securely hung .
4	I have never been competent in an emergency, and *time was lost as* I **tried to**	figure out whether	to dial 999, or 9 for an outside line then 999 .
5	I **strained** to	hear if	it was a record but it was that tune , broken in his usual stumbling places .
6	Thus together they amount to a concerted **attempt to**	investigate whether	or not any form of vertical behaviour is to be allowed .
7	Now , the world's most intensive investigation into the effects of disorders such as anorexia nervosa is about to begin in Scotland **in an attempt to**	find out what	can be done to help .
	Investigators **are** still **attempting to**	establish what	caused the Martin Pipe-trained hurdler Her Honour to fail a dope test

Figure 4.17. 'Trying' type expressions with [knowledge-seeker] + [find out] + *wh*

While TRY *to* and related forms express the goal-oriented activity of a knowledge-seeker, purpose clauses link a purpose of finding out information with the activity that is needed to achieve this objective. While the use of an infinitival purpose clause is not the only way of expressing this relation, it is by far the most common

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way for this meaning frame. Some examples with TRY *to*, such as line 1 of Figure 4.17 arguably express the same meaning, as does example (1), since one could delete *if you want* without changing the meaning to a great extent.

(1) This method is therefore the one to use *if you want to* **work out how** the pattern should be placed for matching side or raglan seams, cardigan fronts and so on.

The first four lines of Figure 4.18 show a range of ways of expressing that the activity is necessary for the 'knowledge-seeker' to find out the missing information. These examples have been chosen to illustrate the types of activity involved (in italics) and also to indicate the range of forms that are used to indicate that the procedure is necessary (in bold). We can note the range of forms used to express obligation includes imperatives (line 1), *must* (line 2) and introductory *it* expressions (line 3). Apart from 'necessity' and 'past' examples (lines 5-7), which are the two largest groups of instances of this type, there is a large variety of other ways of referring to both temporal and modal meanings. As line 9 suggests, instances with *will* typically refer to a planned research project or enquiry.

1	To	check how	much a paragraph is inset **move** the cursor into that paragraph and **look at** the ruler line .
2	If the local authority has itself obtained an emergency protection order **it must** *make inquiries* to	ascertain what	action it should take next (s47(2)) . All or part of the investigation may be delegated to another agency such as the NSPCC .
3	**It is important to** *go through these documents* in order to	check what	you have got, so that you will know at which stage they should be completed .
4	As described in Chapter 4 (pp. 41-102), **trials of appropriate test items were carried out** in order to	ascertain how	difficult pupils found the items .
5	To	find out whether	the presence of toxoplasma-specific antibodies was related to clinical status **we classified** the patients in three groups (table).
6	Springfield **organised a quick roll-call** to	check if	anyone was missing, deputing the leaders of each group to count his own comrades.
7	Secondly , investment analysts **will be approached to**	investigate how	they view companies with substantial R&D investments , again with particular interest in accounting practices and disclosures .
9	It provides a good overview of the situation on how irradiated foods of different kinds **can be monitored** both for effects and to	check whether	they have or have not been irradiated .
10	The Act also **empowers** the police **to** set up roadblocks to	discover whether	vehicles contain anyone who has witnessed , committed or is about to commit a serious crime .
11	The Thurstone **procedure** involves judges ranking the test items on a scale from "most authoritarian" to "least authoritarian" to	establish which	items are most indicative of different degrees of authoritarian sentiment. Finally , the test items selected are weighted accordingly and used ...
12	They look at them through microscopes just to	find out what	they're made of.
13	Tests are being carried out to	establish how	dangerous the water is .

Figure 4.18. Examples of purpose clauses with [knowledge-seeker] + [find out] + *wh*

Figure 4.19 presents examples of instances involving infinitives expressing purpose and some kind of physical action, typically being in or moving to a location in order to make it possible to find out the information (around 11 hits pmw). The

verbs most associated with this meaning *see*, *check*, *hear* and *find out*. Most examples involve verbs of motion - going, setting off/out, or visiting someone/somewhere with the purpose of finding out information once one is there (see bolded items).

1	The IAEA wants to **be there to**	check whether	fuel rods have been removed in the past , and to ensure that the spent fuel is not diverted for military purposes .
2	I always **attended** their concerts **to** try and	work out how	he got this effect . RO
3	She gritted her teeth. 'I'm **going to** the tourist office right now, **to**	see if	there 's anywhere I can stay tonight - -'
4	Archibald Higgins is an ever-curious adventurer who **sets out** to	discover what	the world is really like aided by a motley assortment of friends
5	But flustered John 's ordeal only ended when police **went** to	investigate what	was causing the two-mile tailback near Gateshead .
6	Then **go** to different parts of the room to	check whether	you can see and hear clearly everywhere .
7	'I'm leaving her in your care , ma'am,' he said. 'I**'ll drop in** tomorrow to	see how	she is .] Peg O'Malley nodded .

Figure 4.19. Examples of purpose clauses with movement/location verbs and [knowledge-seeker] + [find out] + *wh*

The final set of examples, in Figure 4.20 show that the 'knowledge-seeker' is sometimes shown as reluctant or not interested in finding out information. This is a rare use for this meaning frame with only 0.7 hits pmw.

1	She winced , closing her eyes, **not wanting to**	hear what	came next , because she could guess
2	just as English speakers **are not particularly interested in**	establishing whether	there are two or more than two persons or objects.

Figure 4.20. Examples of lack of volition with [knowledge-seeker] + [find out] + *wh*

What we have seen in terms of the expression of volition and purpose with this meaning frame is that each expression type has its own usages, but also that the associations between certain verbs (e.g. INVESTIGATE) and particular subject types remains fairly consistent.

4.2.3 The estimation of potential with [knowledge-seeker] + [find out] + *wh*

Section 2.4.3 indicated the ways available to speakers beyond the *possibility/ability* modals (*can, could, may* and *might*) and semi-modal (BE) *able to* which can be used to indicate their estimation of degrees of potential. These expressions can be seen as complementing the meanings of the more familiar forms and as encompassing the notions of *difficulty* and *enabling*. Potential expressions with **V wh** are divided into four main types, shown in Table 4.4. The essential differences between them are in the way that they characterise the potential: able/ability expressions tend to be more explicit about the type of potential, linking it to a particular entity, existential expressions refer to the situation rather than a specific 'enabled party', and 'enabling' expressions make the 'enabling factor' explicit as the subject.

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Table 4.4. Typology of expressions of potential

type	main forms
modal	*can, could, may*
able/ability	X BE [able] *to* X HAVE [ability] *to*
existential	*it* BE [difficult] *to* WAY *to / of*
enabling	X [enable] Y (*to*)

Figure 4.21 offers an overview in terms of frequency for each main expression type

for this meaning frame. These figures indicate some points of interest. While modal

auxiliaries *can* and *could* (and a small number of instances of *may* and *might*) are

more frequent than the other types and in particular 'able/ability' types ('able to' and

'unable to' in the Figure), taken as a whole, other expressions outnumber the

modals. If we look at the other types, for existential expressions we can note the

relative frequency of introductory *it* expressions (labelled 'easy to' and 'difficult to')

compared to other types (e.g. *there* BE *a* [way] *of*; *the* [difficulty] BE *to*); expressions

referring to *enabling* also vastly outnumber *preventing* ones.
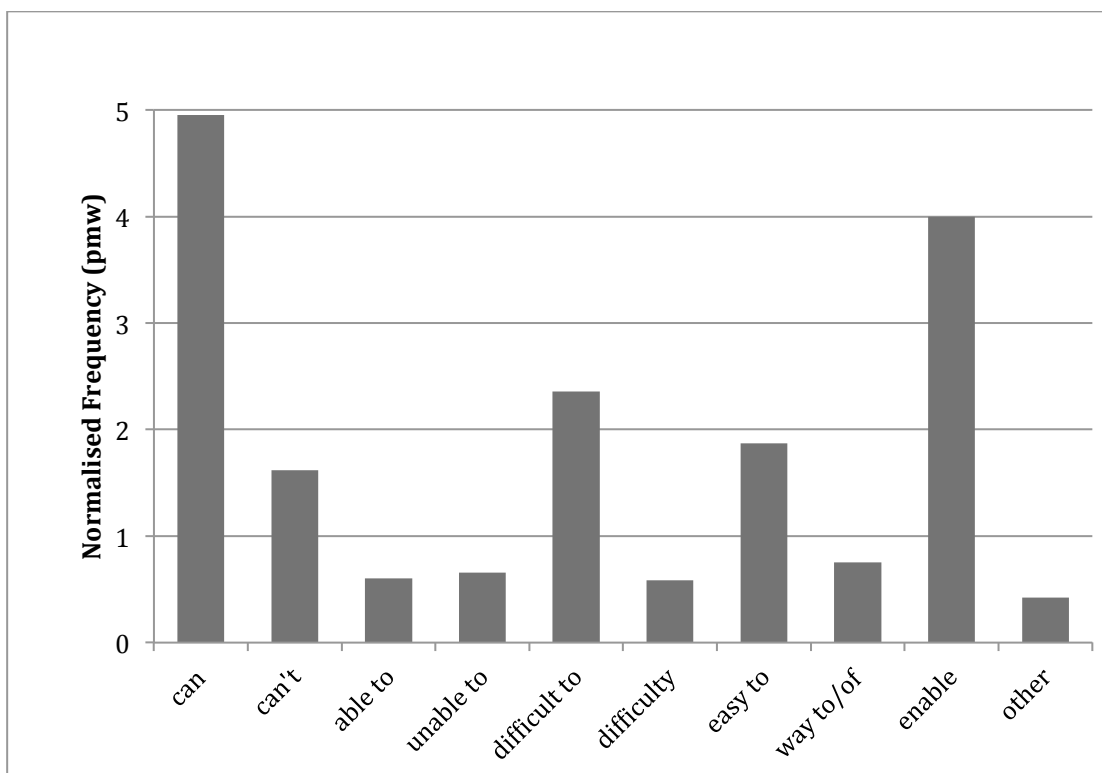
Figure 4.21. Distributions of exponents of potential with [knowledge-seeker] + [find out] + *wh*

The first set of examples (see Figure 4.22) presents a sample of 'finding out' verbs with *can, could* and *may* with potential meanings. Instances with *may* and *might* are only found with positive polarity and then only represent around 3% of instances; *can* predominates, with 90% of instances. With instances referring to positive polarity, which have a normalised frequency of around 4.9 hits pmw with this meaning frame, the verbs most associated are *check* and *work out* (around 5% of the **V wh** instances in both cases); all 'finding out' verbs occur except *investigate*. The potential meaning of these modal verbs is, in more than 90% of cases, supported by items in the co-text, whether markers of contingency (*if* in

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lines 1 and 2), means of achievement (*by* in line 3; *so that* in line 5) or some kind of skill, as in line 4, where the ability is confined to ***good*** editors.

1	Obviously you can use these *if* you **can**	figure out how	they open, erm, to protect documents.
2	it would be useful *if* we **could**	establish how	long the books have been there.
3	Each of the dealing firms has a different amount of stock but you **can**	work out who	has what *by* how keenly the prices compare with the best bid, best offer.
4	but *a good editor* **can**	figure out how	to do that
5	good industrial relations practice ... requires consultation with the redundant employee **so that** the employer may	find out whether	the needs of the business can be met in some other way than by dismissal
7	'I **can't**	figure out which	buttons to push but it might be that he's rather more intelligent,' admits Dad.
8	Yeah. I **couldn't**	work out where	I'd seen him.
9	He **could** never quite	work out whether	or not Willi was being deliberately naughty.
10	*Until delivery of the goods to the beneficiary*, his creditors and buyers **cannot**	ascertain whether	the goods were actually loaded on board, or whether the freight was paid.

Figure 4.22. Examples of modals of potential with 'finding out' verbs

Instances with modals referring to lack of potential – which are less frequent at around 1.6 hits pmw – are most closely associated with *figure out* (22% of all **V wh** instances) and *work out* (9%). The incidence of *couldn't* is greatly increased compared to positive *could* (58% of negative instances compared to only 6.5% of positive). These instances do not normally give a reason why the information cannot be ascertained; only around 27% of cases are like line 10, where the italicized items indicate the reason why it is impossible. Thus the majority of

instances are like lines 7-9, where the subject referent is presented as unable to *figure out* or *work out* the answer to a question.

As noted in Section 2.3.2, BE *able to* has received considerable attention, featuring as a 'semi-modal' in several studies of modality including Coates (1983) and Collins (2009). However, there are other ways of referring to the potential of the subject referent; not only other adjectives apart from (*un*)*able* in the phraseology X BE [able] *to* but also the phraseology X HAVE [ability] *to*. Examples are shown in Figure 4.23.

1	We **may** eventually **be able to**	check whether	the verbal arguments for the Darwinian evolution of language can be simulated on a computer.
2	For example there are supposed to be many wives who would have left their husbands long ago if they **had been able to**	work out how	to tell him they were going.
3	With currently available equipment we **are not able to**	discover what	goes on in detail in the brain when someone is speaking
4	If a character manages to take the wand he**'s not going to be able to** sit down and	figure out what	it does in the heat of battle, so it's not usable immediately .
5	We did not want to be the cause of friction; but as we **were unable to**	ascertain what	the Club had in mind by way of arrangements, we proposed tea or dinner
6	Once you have these you **are** then **in a position to**	work out which	behaviours to use and which behaviours to avoid yourself
7	This is important because it recognises that retailers **may not have the knowledge or the resources to**	check whether	the goods he sells meet the general safety requirement, especially in the case of second-hand goods.
8	Norwegian freedom fighters had discovered the existence of the base; but **had no way of**	ascertaining whether	the Dane was a collaborator or a forced worker.

Figure 4.23. Examples of 'able/ability' type expressions with 'finding out' verbs.

In terms of X BE [able] *to*, which has a combined frequency (positive and negative

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instances) of around 0.8 hits pmw with this meaning frame, only around 13.5% of instances involve items other than (*un*)*able*; these are *in a position to* (line 6)*, qualified to, not streetwise enough to, too shattered to,* and *hard put to*. The greater syntactic flexibility of X BE [able] *to* compared to modals is seen in around 66% of instances (see lines 1, 2 and 4), offering some support for Coates' (1983: 126) suggestion that BE *able to* is a suppletive form for *can/could*. However, as Coates (1983) acknowledges, the far greater frequency of *can/could* somewhat weakens this argument. At the same time, the same verbs are found as with the modals.

The phraseology X HAVE [ability] *to/of* is rather infrequent, with 0.3 hits pmw, around 60% of which refer to lack of potential. The noun *ability* is not found at all this meaning frame. We can see from lines 7 and 8 in Figure 4.23 that other, more specific resources or opportunities are referred to instead; apart from *way to/of*, there is also reference to *time, chance, expertise* and a *formula to*.

Figure 4.24 provides instances of existential expressions with this meaning frame, so named because they refer to the existence of a difficulty, or possibility rather than associating a potential with a particular subject referent. Two main types were noted in Section 2.4.3: adjectival introductory *it* expressions referring to degree of difficulty of the form *it* BE [difficult] *to* with the adjectives *(im)possible, easy, hard* and *simple* and nominal existential expressions involving *way to/of.* If we consider all these expressions together, the verbs most associated are ASCERTAIN (nearly 14% of ASCERTAIN *wh* instances), DETERMINE (8%), ESTABLISH (7%) and WORK *out* (7%), a different set from those associated with modal verbs.

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This type of expression offers not just greater syntactic flexibility than the modals *can/could/may* but also a greater subtlety of expression, with a range of options between *can* and *cannot*. In terms of *it* BE [difficult] *to*, considering both 'difficult' (40% of instances) and 'easy' (60%) instances together, this phraseology has a frequency of around 2.9 hits pmw with this meaning frame. The adjectives found most often are *possible* (48%), *difficult* (26%), *impossible* or *not possible* (14%), *easy/easier* (6%) and *hard/harder* (6%), but *quicker, straightforward,* and *simple* were all found.

1	Presumably he had been a football fan but **it has not been possible to**	discover whether	he supported Liverpool or Everton .
2	The data was submitted on a confidential basis, because of the possibility of future publication, and so **it is not possible to**	ascertain whether	or not it had any influence on the deliberations of the Review body
3	**It wasn't difficult to**	work out what	each word meant
4	Firstly, **it should be possible to**	find out what	is already known from the local Sites and Monuments Record or Royal Commission for Historical Monuments/Ordnance Survey records.
5	Since **it may take many hours to**	establish what	influences the activity of a single cell, this is a far from trivial issue .
6	And it's **a good way to**	check if	You know it.
7	use writing as a **way of**	working out what	you want to say
8	Unless there is regular guidance given to parents […] the arrival home of the reading book will be seen as little more than **an opportunity to**	check when	the teacher last heard their child read and a chance to rush their child to the next stage on the reading scheme .
9	**The real difficulty is** in each case **to**	ascertain how	far such implications extend.

Figure 4.24. Existential expressions of potential with [knowledge-seeker] + [find out] + *wh*

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Another way of expressing that something is difficult is to focus on the amount of time or other resource taken or needed, as exemplified in line 5 of Figure 4.24; this type of expression occurs around 0.8 times pmw, and 'time' is the only resource type that occurs more than twice with this meaning frame, though there may be reference also to the amount of *experience* needed, for example.

In terms of *way of/to* expressions referring to how it may be possible to find out the answer to a question, these occur around 0.6 times pmw with this meaning frame, particularly with the verb CHECK. While most of these involve either *way to* or *way of* (53% and 30%, respectively), other nouns were found, including *method, means, device* and *technique*; around half of the instances evaluate the *way* as *good, reasonable, the only* etc. and almost all fit into the pattern X BE *a way to/of.* Lines 8 and 9 are included to indicate other rarer existential nominal expressions that were encountered in the concordance lines: *opportunity/chance to* (0.14 hits pmw) and *difficulty/problem/task* BE *to* (0.19 hits pmw).

The final main way of referring to potential is by means of 'enabling' expressions, that is, the phraseology X [enable] Y (*to*), where X is the enabling factor and Y is the enabled entity. It is the only expression of potential that integrates the enabling factor into the clause as subject. It occurs around 3.5 times pmw with 'finding out' verbs, showing no particular preference for specific verbs, but occurring with all of them.

For this meaning frame, apart from ENABLE (19% of instances), the other verbs identified were HELP (19%), ALLOW (18.5%) and LET (43%); all the 'finding out' verbs

occur, with no particular associations. The inclusion of HELP, however, is less obvious; we can note from lines 3 and 4 that HELP tends to occur in contexts where it is itself modalised or non-finite (14 out of 16 instances are non-finite). Examples are provided in Figure 4.25, where we can note the typical subjects of these expressions are documents (line 1), courses (line 2), research (methods) (line 3, 5) or visual information (line 4). Lines 5 and 6 in Figure 4.25 show examples of far rarer expressions (no more than 0.15 hits pmw) including MAKE *it* [easy] *to* and [give] X *opportunity/chance/time to.*

1	The FMC regulations also [...] **enable** ocean carriers **to**	ascertain whether	they are doing business with an untariffed or unbonded NVOCC.
2	The advice is being given in a course run by the police and a local authority to **help** children	learn how	to deal with strangers.
3	The use of simultaneous 24 hour intraoesophageal pH measurement and four channel manometry […] **allowed** us to	find whether	the effect of treatment onoesophageal pH was attributable to changes in oesophageal body motility .
4	thankfully, as in almost every area of this program, and **[sic]** animated preview is available to **let** you	see what	the final effect is like.
5	CL **makes it much easier to**	determine if	sparry fabrics are of neomorphic or cement origin by displaying growth zones in crystal aggregates (Dickson, 1983).
6	Drivers **are being given** the chance to	find out what	it feels like to skid across an icy road into the side of a building -- without risk of injury.

Figure 4.25. 'Enabling' expressions with [knowledge-seeker] + [find out] + *wh*

The analysis of 'finding out' verbs also yielded a small number of instances with *how to* (around 0.38 hits pmw). These are included with expressions of potential due to their close relationship with *way to / of* expressions. Some examples are

shown in Figure 4.26.

1	A thick weekend, McLeish decided, trying to think **how best to**	establish what	Yeo's relationship had been with the dead girl.
2	**How To**	Work Out If	You Qualify For Benefit To work out whether you can get benefit you need to follow the steps below, which are then explained .
3	**How** else **is** the good reader **to**	establish what	is good for him or her individually?

Figure 4.26. Examples of *how to* with [knowledge-seeker] + [find out] + *wh*

This section has provided a range of examples to support the arguments that a focus on (BE) *able to* as a 'suppletive' (Coates 1983) form of *can/could* overlooks a range of other possibilities available to speakers in discourse. These characterise the potential in different ways, changing the focus away from the subject-referent. It is also clear that they attract different verbs.

4.2.4 Expressions of uncertainty with [knowledge-seeker] + [find out] + wh

Expressions of uncertainty are not found frequently with this meaning frame, at least not without combining with some other type of modal expression. They account for less than 4% of total instances, or around 6.2 hits pmw. The main forms involved are shown in Table 4.5.

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Table 4.5. Typology of expressions of uncertainty

Type	Main forms
modals, semi-modals	*will, would, may, might, must, should*
adverbs	*probably, perhaps*
projection	[think] (that)
conditional	*if, unless*
***yes-no* question**	*Have you …?*

Figure 4.27 shows the extrapolated distributions of the different means of expressing uncertainty with this meaning frame. There is a clear predominance of modal auxiliaries; other means are infrequent with 'finding out' verbs. This may be because these other forms readily combine with modal expressions, although only around 10% of the instances of modal verbs combine harmonically with these other expressions. The 'think that' bar in Figure 4.27 refers to mental verbs with *that-*clause complementation. The 'other' group, containing other instances classed as 'uncertain' is described below.
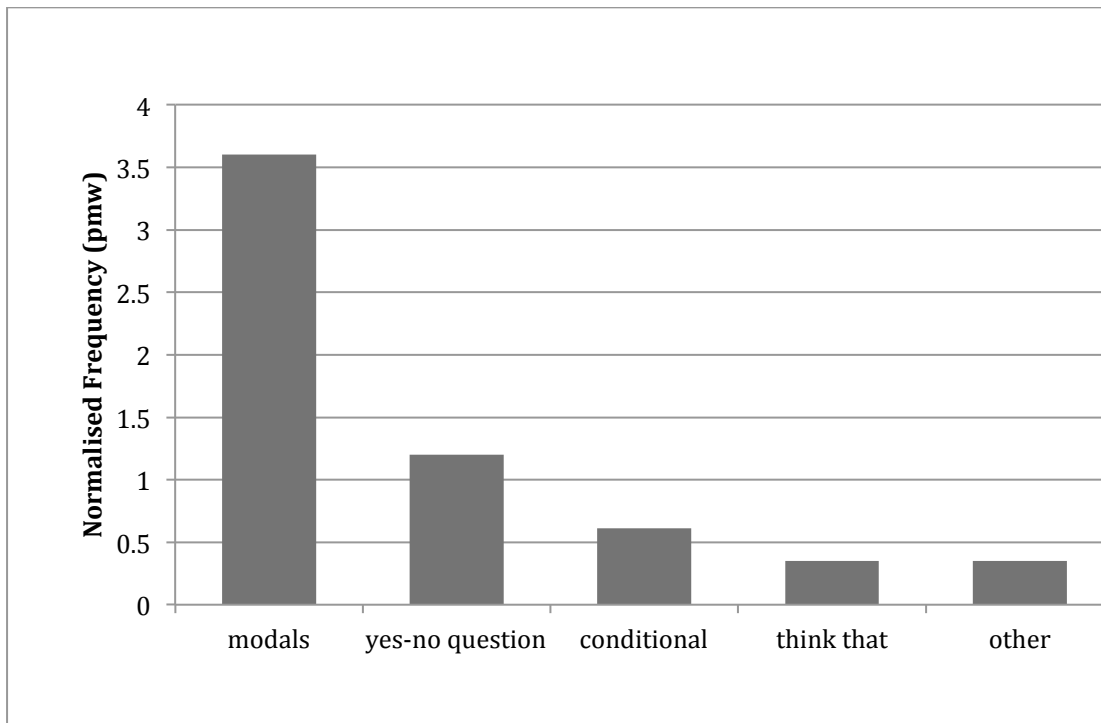
Figure 4.27. Distributions of types of uncertainty expression with 'finding out' verbs

As indicated in Figure 4.27, modals indicating uncertainty co-occur frequently with [knowledge-seeker] + [find out] + *wh* relative to other modal expressions (around 3.6 hits pmw or 60% of all uncertainty instances). The finding out verbs most associated with these modals are DISCOVER (5% of instances with uncertainty modals) and LEARN (5.5%). It is interesting to note that the verbs that are associated with *will* and *would*, are different from those that are more associated with volition meanings of these same modal verbs (*see* and *check*) as shown in Section 4.2.2. Around 68% of modal instances involve high confidence *will*; other modals (*would*, *may*, *might, must have, would have*) occur in no more than 6% of instances.

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Since these modals are potentially ambiguous with a 'volition' meaning (*will, would* or potential and permission meanings (*may*), it is interesting to note the extent to which co-textual cues provide serve to disambiguate the meanings. These are seen in around 78% of cases, whether some kind of time expression such as *soon* (line 1), a temporal or conditional subordinate clause, the evidence for the prediction (*on the basis of* in line 3) or harmonic expressions (Coates 1983) of uncertainty such as *perhaps* and *you would have thought that* (around 10% of uncertainty modal instances). Line 5 also includes such an expression, *we were terrified that*, which combines the idea of uncertainty with that of undesirability. Instances of *you will* which do not have such markers (line 2) invariably refer to a course or learning opportunity.

1	Don't you worry, we'll *soon*	find out what	it is.
2	You **will**	learn how	to make, and make use of maps of all kinds, skills which are useful in later life.
3	*On the basis of what the Minister says*, we **will**	learn whether	the Government's thinking has advanced.
4	*Perhaps* also, a new officer **might**	learn how	little his place was actually worth after he had accepted it
5	Although we *were terrified that* they **would**	find where	we had hidden our film equipment
6	Western scholars **may** never	discover how	many Soviet citizens perished at the hands of Beria 's NKVD troops (or Abakhumov's SMERSH, operating in the enemy rear)
7	You *would have thought that* after so many months of bad publicity, they **would** have	learned how	to treat their clients, if only for the sake of their public-relations image.

Figure 4.28. Modals expressing uncertainty with [knowledge-seeker] + [find out] + *wh*

Means of expressing uncertainty apart from modal verbs are quite infrequent with

this meaning frame; *yes-no* questions occur 1.2 times pmw, conditionals 0.6 times pmw and mental verbs with *that*-clauses 0.35 times pmw. Some examples are provided in Figure 4.29. Lines 1-3 show mental verbs THINK (43% of instances), HOPE (35%) and GUESS, which, like BELIEVE and ASSUME is only attested once. The use of HOPE in line 3 combines the idea of uncertainty and an extra layer of attitude by expressing the desirability of finding out. Lines 4 and 5 show conditional instances; all the *if*-conditionals found with this meaning frame – which are evenly split between *if* and *unless* – indicate that the speaker considers the finding out possible. At the same time, there is also the implication that the finding out is important in some way either for the speaker (*let me know* in line 5) or for the subject of the sentence.

1	I **guess** you've	worked out how	to fly this thing. So which way?
2	When I saw him dancing at the Saturday night disco at the Turtle Bay Hilton **I thought** I had	discovered how	it was he managed to survive those horrendous wipeouts. At some early stage in his evolution he *must have been filleted* .
3	One **can only hope that** we, as the panda's worst enemy […] have finally	learnt how	much we have to lose.
4	Adults won't get very far in trying to help someone **unless** they	find out what	their reasons are.
5	**If** you find it and	work out what	it's all about, let me know; he said there was something secret buried in it.
6	'Have you	heard how	he is?' 'Not yet .
7	'Did you	check if	the flight was on time?' 'Of course.

Figure 4.29. Examples of uncertainty apart from modal verbs with [knowledge-seeker] + [find out] + *wh*

With *yes-no* questions (lines 6-7 of Figure 4.29), the utterance of the question

indicates the speaker's ignorance of the answer but also in all of these cases functions as an indirect question, that is, a request for information (which is acknowledged by the addressee's response in lines 7 and 8; 77% of cases involve present perfect *have you …?*

A few examples of other means of expressing uncertainty, were found, all of which are under 0.1 pmw. These are modal adverbs (*probably*), EXPECT/HOPE *to*, the **V wh** pattern itself (*asking whether…*), and evidential expressions: reporting verbs with *that*-clauses, SEEM *that* and APPEAR *to*.

4.2.5 Negative [knowledge-seeker] + [find out] *+* wh

There are relatively few instances of the meaning frame [knowledge-seeker] + [find out] + *wh* which are straightforwardly negative; around 1.8 pmw, or just over 1% of all instances. A sample of these is provided in Figure 4.30. The verbs most likely to be negative are WORK *out*, LEARN and DISCOVER; the last two of these are also more associated with uncertainty. A range of structures are used; with past tense instances, *never* is found 80% of the time (line 2). Around 64% of instances, however are present perfect, like those seen in lines 3-5, where the implication is that although at present the answer is not known, it will be discovered at some time (see bolded items). These present perfect instances are more associated with WORK *out* and FIGURE *out*.

1	I **did not**	find out how	much she sold the garments for because she left me standing outside
2	Her problems began when a chemical drum in the back of her van sprang a leak , and filled the van with fumes. She **never**	discovered what	chemical it was, but the immediate effect was to produce a headache , sore throat and intense irritation of the nose and eyes .
3	Even now the many and various suppliers of loam-based composts **have still to**	discover how	to get their products to customers in a state that is fit to use .
4	We **have yet to**	learn how	to communicate and make decisions in an electronic environment .
5	**Nobody** has convincingly	worked out how	such a distortion might occur, but the notion that odd things can happen in the solid state is firmly entrenched in many minds .
6	Have you seen salespeople handing out free samples at public events **without**	checking if	the recipients smoke ?

Figure 4.30. Negative examples of [knowledge-seeker] + [find out] + *wh*

4.2.6 Indicative [knowledge-seeker] + [find out] *+ wh*

Although this study is not strictly interested in indicative instances such as those in Figure 4.31, since they are not modal, they provide some contrast with other instances of the meaning frame. The frequency of these is around 13.8 hits pmw, or around 8% of the total for the meaning frame. We can note the prominence of LEARN (39% of this verb's instances are indicative), INVESTIGATE (29%), HEAR (24%), and DISCOVER (20%). The use of LEARN is particularly associated with direction *wh*-clauses (LEARN *how to do something*; 66% of cases) as seen in lines 1 and 2, while HEAR is found with declarative *how*-clauses in the phraseology [the court] *heard how* X [happened] in around 55% of cases (line 3). The majority of instances

(around 75%) involving these and other 'answer-oriented' verbs (see Section 2.5) are past tense reports, commonly with some kind of time reference (see lines 4-6). Line 2 shows present tense general reference to someone learning how to do something or working out an answer to a question; such instances refer to a particular process by or means by which the investigator comes to the answer.

1	Gangster star and friend of real-life mobster Bugsy Siegel, George Raft had	learned how	to take care of himself during his younger years as a prize-fighter .
2	When families talk in this way, a number of different benefits accrue. Children	learn how	to take part in discussion, not just in the making of statements .
3	Judge John Prosser	heard how	he floored rival skipper Howard Sully with a punch .
4	During his voyage from India , Chandrasekhar	worked out how	big a star could be and still support itself against its own gravity after it had used up all its fuel .
5	Could you spot which from the rhythm? Having	discovered which	it is , say it up-to-time at normal speed.
6	I was very surprised when I	discovered what	he was ringing about .
7	The present research	investigates how	being good at phonological segmentation helps a child to learn to read .
8	Detectives are	investigating whether	it was an accident , a murder or a suicide pact .
9	We have a team of people in Job Broking Branch and two people on loan from South West who are	working out what	we need to do next.
10	This time last year we were fairly hyped-up with an election coming and people were	checking if	they were on the register.
11	A number of studies have	investigated whether	any 'causal' relationship can be established between volume and volatility.

Figure 4.31. Examples of indicative [knowledge-seeker] + [find out] + *wh*

In contrast, instances with the question-oriented verbs INVESTIGATE and CHECK are

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themselves uncertain about whether the answer is or will be known. Mentioning that something has been or is being *investigated/checked* avoids commitment as to the success or otherwise of the investigation (see lines 7, 8, 10 and 11). These are much more likely to be present tense – only 23% of indicative instances of INVESTIGATE are past tense and for CHECK the figure is 6%. At the same time, present progressive forms were found of a number of 'finding out' verbs, in particular LEARN and WORK *out*, which also take on question-oriented meaning in these cases, as in line 9, where the *working out* is still going on so the answer is not known. These question-oriented cases account for about 20% of indicative 'finding out' instances.

4.3 Conclusion

This chapter has proposed the meaning frame [knowledge-seeker] + [find out] + *wh* and investigated how it is associated with the range of modal meanings introduced in Chapter 2. Their investigation has shown how there is a range of modal expressions beyond modals and semi-modals which tend to complement and extend the range of meanings expressed by these more familiar forms. We have further seen that, at a coarse-grained level, that of the overall meaning frame, 'finding out' verbs are associated with most types of modal meaning. At more detailed levels, phraseologies start to emerge involving specific verbs or groups of verbs.

CHAPTER 5 – 'THINKING' FRAMES

5.1 Introduction

This chapter proposes two meaning frames which have been grouped under the heading 'thinking': the first of these, [decider] + [judge] + *wh* refers to making judgements or decisions and the second, [thinker] + [imagine] + *wh* to giving thought to a question. The sequences proposed in this chapter thus have in common that they construe a person engaged in mental activity which may result in either a decision or a mental image / guess. However, they are quite different in terms of their association with modal meaning. The first frame, [decider] + [judge] + *wh*, is associated with the full range of modal meanings, while the second, [thinker] + [imagine] + *wh*, is much less associated with modal meanings and indeed creates different meanings when combined with them.

5.2 The meaning frame [decider] + [judge] + *wh*

This section will outline the decisions that led to the proposal of the meaning frame [decider] + [judge] + *wh*, a meaning frame that includes reference to the exercise of judgement in terms of evaluations of situations, including making decisions on actions.

Table 5.1. Overview: 'judging' verbs

study	meaning groups	example verbs
Karttunen (1977)	verbs of conjecture decision verbs	*guess, predict* *decide, determine*
Francis et al. (1996) **V wh**	THINK DISCOVER	*consider, decide, determine, guess, imagine, predict, think, wonder* *assess, decide, determine, guess, judge, (can) tell*
Francis et al. (1996) **V wh-to-inf**	DISCOVER DECIDE	*determine, guess, see, think* *consider, determine, decide, imagine, judge*
Biber et al. (1999)	Cognition verbs	*assess, consider, decide, determine, guess, imagine, predict, think, wonder*
Trotta (2000)	Judgment Perception/Reflection	*decide, determine, guess* *consider, imagine, wonder*
Huddleston & Pullum (2002)	Guessing Deciding	*guess, predict, judge* *decide, determine*
current study	[decider] + [judge] + *wh*	*assess, choose, consider, decide, determine, establish, judge, predict, tell, think, wonder*

The final row in Table 5.1 shows the verbs which have been included in this meaning frame; the fact that all of them except ASSESS, CHOOSE and JUDGE also have senses included in other meaning frames indicates the complexity of this area. Further evidence of this complexity can be seen in the treatment of these same verbs in previous studies. While reference is made in nearly all studies to a meaning group relating either to *deciding/decision* or *judgment*, with DECIDE and DETERMINE as invariable core members, there is less agreement about the other members of this group. This can be attributed partly to the patchy coverage of less frequent verbs and partly to a general lack of attention to polysemy in studies other

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than Francis et al. (1996).

The aspect of meaning that this study focuses on relates to the exercise of judgement, which may relate to discerning or assessing an answer to a question or deciding what to do in a situation. Some observations have already been made regarding this meaning group in relation to DETERMINE and DECIDE in Section 4.2. As noted there, one characterising feature of instances classed in this meaning frame is that the subject referent (or implicit subject referent, for example in imperative clauses or existential expressions) has some control over the answer to the *wh*-clause question by being in charge of making the decision. This is the case whether the subject is an official *inquiry* with power to make decisions involving others, as in lines 1-3 and 6 in Figure 5.1, or where the decision or evaluation is a more personal one, as in lines 4 and 5. Where these instances involve what were described as direction *wh*-clauses in Section 2.6.2, the decision is about what action should be taken. These *wh*-clauses may involve modals of obligation such as *should* (lines 1 and 2 in Figure 5.1) where the decision affects others, or they are infinitival *wh*-clauses (lines 4 and 5). Other verbs with meanings related to thinking or cognition (see Table 5.1) also refer to judgements or decisions, as lines 4-6 illustrate; THINK and WONDER only have a judgement meaning when followed by a direction *wh*-clause. The final three lines in Figure 5.1 show how instances interpreted as involving judgement do not just relate to actions that may be carried out but to assessing or predicting the right answer. In these instances, the *wh*-clauses are not direction *wh*-clauses, but the subject referent still has control over

the answer; they are the 'decider'.

1	Last year the Countryside Commission called for an **inquiry** to	decide whether	recreational vehicles should be banned on Sundays and Bank Holidays on the stretch between Streatley in Berkshire to Overton Hill .
2	A Water Service Company may at any time require the **Director General** to	determine whether	, and if so how, K should be changed.
3	And the county council feels that it has adequately addressed the needs of the districts within the county , erm obviously that's up to **the panel** to	determine whether	you agree with that
4	If the target is a client, discuss implications of the contact with the client partner and	consider whether	to proceed.
5	I've only got a fiver in me purse just	wondering whether	to get black or blue though?
6	The children *have to make a decision* about using the magic, **they** have to	think when	would be a good time to use it and when would be harmful .
7	At four o'clock each evening **the team** at the Grid Control Centre has to	assess how	much gas the entire region will use the following day .
8	**Others**, then, will have to	judge whether	my views expressed here are consonant with that tradition.
9	At your meetings with him try to	predict what	certain committee members will say and how they will act .

Figure 5.1. Instances of [decider] + [judge] + *wh*

Some of the 'judging' verbs occur in different senses in other meaning frames. A good example is PREDICT, which either relates to a prediction one makes to oneself, as here, or one that is communicated to others, in which case it is classed with [source] + [describe] + *wh* (see section 7.2).

Before looking at the ways this meaning frame combines with various types of modal and non-modal meaning, it is interesting to consider the overall

distributions of frequency for these meanings with 'judging' verbs in Figure 5.2. It is clear that the modal meanings of obligation and potential are those that are most associated with this meaning frame, accounting for around 55% of instances, while other modal meanings are less prevalent. In fact, these two areas of meaning, obligation and potential are associated with the two main meanings of [decider] + [judge] + *wh,* that is, being responsible for making a decision on action and being able to make a judgement or evaluation.
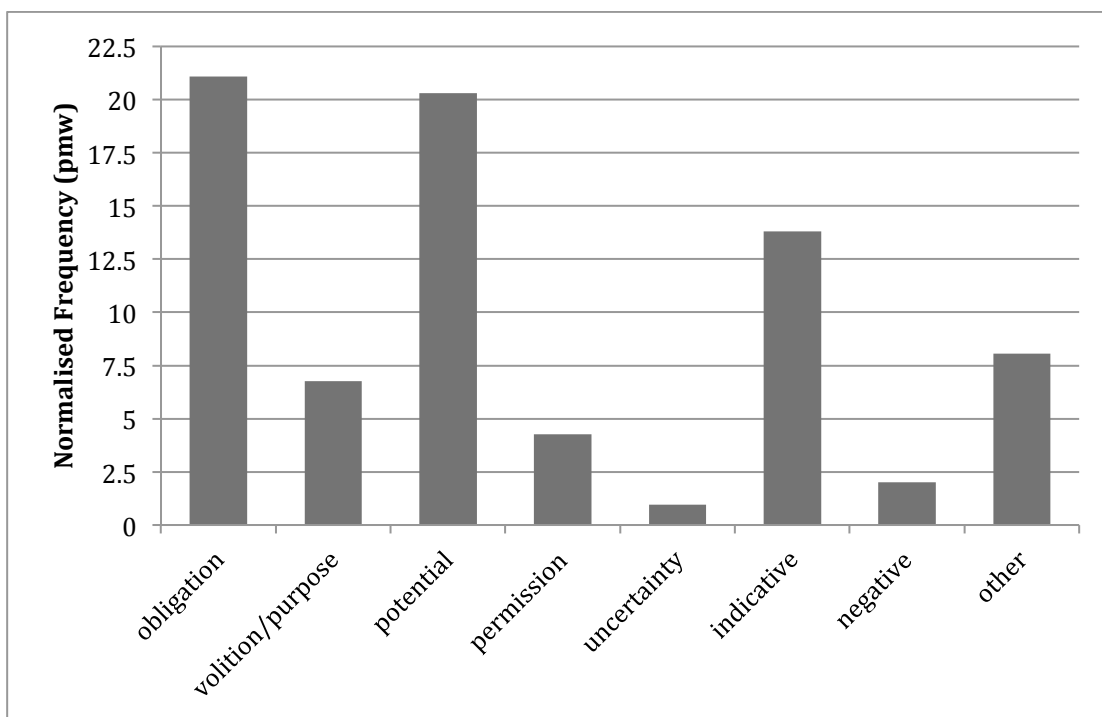
Figure 5.2. Distributions of different types of modal and non-modal meaning for [decider] + [judge] + *wh*

The rest of this section will look at the different meaning types in turn; the first of these is obligation.

This section looks at the expression of obligation with 'judging' verbs. Figure 5.2 shows that expressions of obligation have a frequency of around 21.1 pmw. Almost all the 'judging' verbs have relatively high instances of obligation expressions in their concordances.

The types of expression of obligation first presented in Section 2.4.1 are shown here in Table 5.2 with the main forms used to realise them. They vary according to whether or not they identify the entity under obligation, refer to a general obligation or explicitly identify the source of the obligation.

Table 5.2. Typology of expressions of obligation

Type	Main forms
imperatives, imperative-likes	imperative, *let's* *Can/will you...?*
modals	*must, should*
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*
existential	*it* BE [important] *to* (*there* BE) *need* to
X ask Y to	X [ask] Y *to*
X BE asked to	X BE [asked] *to*
task BE to	*it* BE X's [task] *to*

Before looking at each means of expressing or reporting obligation in turn, it is of interest to consider the extrapolated frequencies of the different types (see Figure 5.3). It is possible to conclude from Figure 5.3 that, while modal verbs and semi-

modals of obligation are more likely to be found with [decider] + [judge] + *wh*, all of the expression types are relatively well represented with the exception of those that refer to lack of obligation. It is, also notable that imperatives are much less frequently found with this meaning frame than with [knowledge-seeker] + [find out] + *wh*, and that the proportions of modal verbs and semi-modals in particular are comparatively higher. The other group that sees a higher proportion of instances is labelled 'task be to' in Figure 5.3; this is indicative of a general tendency for obligation expressions with this meaning frame to report the obligation.
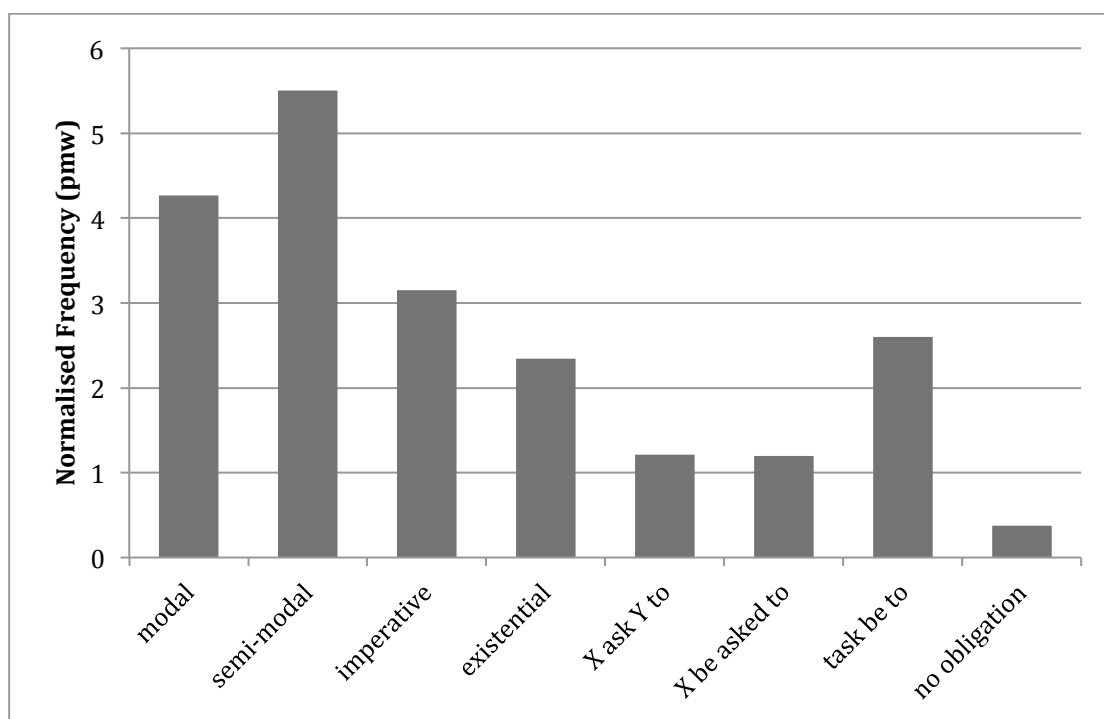
Figure 5.3. Extrapolations of frequencies of different obligation types with [decider] + [judge] + *wh*

Examples of [decider] + [judge] + *wh* with modals and semi-modals are shown in

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Figure 5.4. The judging verbs most associated with the modals are CONSIDER (9% of CONSIDER *wh* instances) and DECIDE (6%); both are also associated with semi-modals (6% and 10% of the sample, respectively) as are CHOOSE (7%) and JUDGE (7%). These examples, like those discussed with [knowledge-seeker] + [find out] + *wh* in Section 4.2.1, show the element of overlap in meaning between modals expressing obligation and the semi-modals, which for this meaning frame are largely confined to HAVE / NEED *to* (95% of extrapolated instances). They also show how the latter extend the range of meanings to reported situations (e.g. line 8).

With first person instances (17% of extrapolated instances), we note the similarity between lines 1 and 2, which both express self-exhortation (Coates 1983), in that the speaker is including himself or herself as one of those who needs to make the judgement. Instances involving *I* avoid modal verbs (as with 'finding out' verbs) and, like line 3, refer to obligation deriving from the situation (here, the speaker's status).

With second person instances (also around 17% of instances), there is a similarity in meaning between modal and semi-modal instances. We can note that *will* line 6 seems to weaken the force of the obligation by suggesting the considering does not have to be done right now – this option is taken around 25% of the time, higher than first (6%) or third person (16%) proportions. The majority of third person instances – around 66% of all modal and semi-modal instances with this meaning frame – involve some kind of authority figure who is responsible for making a decision due to their position (e.g. *prosecutors* in line 7). In these

instances, there is a greater tendency for HAVE *to* and NEED *to* to report past obligation: around 37% are past tense. The predominance of third person instances over other persons compared to 'finding out' verbs (see Section 4.2.1) is a feature of this meaning frame. It is also interesting to note that this increase in proportion is matched by a lowering in the proportion of imperatives (including *let's*) compared to 'finding out' verbs.

1	we cannot just forget the pool of unemployed. We **must**	consider how	to look after them, train them and give them the self-esteem and confidence they deserve .
2	We **have to**	judge whether	recognition of two republics now would increase the very real danger of civil war in other republics.
3	As a manager I have to	judge whether	a young band 's professional tail is wagging the domestic dog or the other way round
4	if you need to do a phonemic analysis you **must**	decide which	sounds are in contrast (belonging to different phonemes), and which are variants (belonging to the same phoneme).
5	When preparing a suggestion for costs to your opponents you **should** run through a checklist of the following tasks which are likely to have occupied your time during the case and	assess how	long you have spent on those tasks or how much time you think you should charge for having completed those tasks
6	You will **need to**	consider whether	the suggested currency is strong enough in the context of anticipated fluctuations in the exchange rate .
7	Just what happens to Noriega remains to be seen. Prosecutors **must**	determine if	they want to continue to harry him.
8	In the other task, subjects **had to**	judge whether	or not a sentence followed appropriately from the preceding context .
9	2 Children, individually or in groups, **can** make up their own nonsense words, and	decide how	they should be spelled . 3

Figure 5.4. Modals and semi-modals of obligation with [decider] + [judge] + *wh*

Line 9 in Figure 5.4 shows an example of obligation *can* for making a suggestion, an interpretation which is based on the observation that this instance is part of a list of similar suggestions. There are only 4 such instances, also including *might* making a tentative suggestion.

Example (1) is illustrates a class of problematic instances (extrapolated frequency 1.2 hits pmw) that arose in the course of the analysis, but which seem closest to an obligation meaning. The common feature of all of these instances is that the subject referent is an authority of some kind – apart from *the Crown Prosecution Service,* other subjects include *Government inspector, councillors, the Head of Department* and various *committees –* who *will* 'judge' the answer to a question which will affect others. In this case, the judgement regards prosecution; as with all but two of the other examples, there is a direction *wh*-clause (including *should*). These instances are given an obligation reading because they present some authority having the responsibility to make the decision.

(1)   The Crown Prosecution Service **will** *decide whether* or not the 30

        runners should be prosecuted for trespassing on the railway.

Huddleston & Pullum (2002) note that the use of an imperative overlaps with first and second person uses of modal verbs; this might be expected since in both cases the obligation implicitly comes from the speaker. Some support for this is seen in that, as for modal verbs, the 'judging' verbs most associated with

imperatives are CONSIDER (7.5% of CONSIDER *wh* instances) and DECIDE (3.7%).
Imperatives have a frequency of 3.15 hits pmw with this meaning group; examples
are provided in Figure 5.5.

As the examples indicate, these imperatives tend to be used when giving
instructions or advice. Like instances of *you must/should* JUDGE *wh*, they follow
clauses referring to conditions or situations in which the judgement needs to be
made (*if*-clause in line 2; *At meetings…* in line 4) or as part of a list of necessary
steps (numerals; *first/before/next/then*; lists of separate actions, as in line 3).
Imperative *try to/and* as a means of softening the imperative is seen in line 4; this
use is very rare in this meaning frame (less than 1% of imperatives); equally rare
are instances of *let's* and imperative-like requests (*you might like to* is attested
once).

1	As when considering the answer to question 18 made of the local authority,	consider whether	any unregistered disposition of the property for value has been made since registration of title became compulsory.
2	You need a measurable target. If you are having a recruitment drive,	decide what	it is you want: 500 members in two years, 2,000 in five or whatever.
3	Allow a trial period. Set a limited period for a trial and	establish what	you will try out and how you will test the results.
4	At your meetings with him **try to**	predict what	certain committee members will say and how they will act .
5	'I was back here and less than half an hour afterwards they were on my doorstep.' '**Let's**	think how	they worked that one.' He frowned .

Figure 5.5. Examples of imperative [decider] + [judge] + *wh*

A number of existential constructions can be used to indicate different degrees of
obligation; seen as a whole, extrapolation of these instances based on BNC

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frequencies indicates they occur just over 2 times pmw with [decider] + [judge] + *wh*. Instances of the introductory *it* phraseology *it* BE [important] *to* make up just under 40% of existential obligation instances. Although a range of items occur (see lines 1-5 in Figure 5.6), *necessary* is by far the most frequent (65% of instances); also attested were *important, critical, reasonable* and *sufficient*. We might note that the high proportion of instances of strong obligation (*necessary, essential, critical* and *important*) compared to weaker obligation *worthwhile* and *reasonable* follows the tendency seen with this meaning frame to be more forceful (e.g. the relative lack of imperative *try to*). In this respect it is interesting to note the use of *fundamental importance* in line 4. As noted in Section 4.2.1, considering instances of introductory *it* together suggests further items that fulfil similar functions; in this case we can note one instance of *it will make sense to*.

We can also note a minor expression type (around 16% of existential expressions) related to *it* BE *time to* but, as line 5 shows, not always with introductory *it*. This instance is notable because it is one of only four to mention who is affected (*for finance directors*).

Another existential obligation expression type (also noted in Section 4.2.1) which emerged from the concordance analysis refers to the means of achieving an end and can be represented as *the first* [step] BE *to.* Examples of this type of expression are provided in lines 6 and 7 of Figure 5.6. All involve either *step, thing* or *task*. Closely related to these are instances of *the important tactic is to, the only way to do X is to* and *one important factor is to*, the first of which is exemplified in

Line 8. These cases make explicit what is generally seen in the co-text of *it* BE [important] *to* instances, that is, the reference to the act of judging as one in a series of steps, as indicated by the italicised items in lines 1, 2, 4 and 5.

These examples also illustrate the general point raised in Chapter 4, that clearer instances of expressed obligation – which constitute the vast majority (nearly 90%) with this meaning frame – involve present tense *it is* and make no reference to the obliged party; this is an indirect way of making a suggestion or giving advice. Past instances like line 1 invariably refer to justification for steps carried out by the speaker.

1	*Before* moving on to make use of the database, **it was necessary to**	assess whether	or not the data itself was valid for the organisation being studied
2	However, **it is essential to**	predict where	condensation will occur, and at what rate, *so that steps can be taken* in the design to reduce the risk of damage to a minimum.
3	**it is well worth while** when your book is still an idea vaguely moving in your head **to**	decide what	sort of a book it is on the whole.
4	*Thirdly*, **it is of fundamental importance** in a few cases **to**	consider whether	the covenant is too vague to be enforced or void for uncertainty.
5	The main season for preparing annual reports and accounts will soon be with us [...] so **now seems a good time** *for finance directors* **to**	assess whether	their annual tome is user friendly. The box below contains a list of salient points to check against your own company's report and accounts .
6	If you are sure of all these facts then you are ready to proceed. **The first thing is to**	decide which	court you want to use .
7	Evidence is all around us, and **the first step** in any research **is** *for the scientist* **to**	decide which	of the many facts are of concern to him. His mind must act as a filter .
8	**The important tactic** with this type of start **is to**	decide whether	to start early or late in the gates 'opening'.

Figure 5.6. Existential expressions of obligation with [decider] + [judge] + *wh*

The closely related obligation expressions X [ask] Y *to* (around 1.2 hits pmw) and X BE [asked] *to* (1.2 hits pmw) account for around 11% of obligation expressions in total for this meaning frame.

Expressions of the type X [ask] Y *to* are unique amongst obligation expressions in that the source of the obligation is explicitly identified. The verbs involved, apart from ASK (22% of instances; no other verb has more than 3 instances) and those shown in the examples are GET, INVITE and SEND. With the rarer instances (21%) of present tense verb and the speaker as source, the obligation is expressed (line 1); Halliday & Matthiessen (2004) point out the similarity in terms of meaning to imperative clauses (a more direct option in line 1). The remaining instances, in contrast, involve reported obligation (see lines 2-5) where it seems important to identify the entity which imposed the obligation, for example the *Gaming Regulatory Act* in line 2. We can note that line 5 is of a type identified in Chapter 4 as more marginal since it involves a purpose clause rather than an infinitival complement; an obligation reading here depends on the obliged party being identifiable as an entity that *can* be obliged. In this case it is a *committee*; other entities are an *inquiry,* a *meeting,* a *council,* a *tribunal* and a *judge*. As with 'finding out' verbs, a significant minority of instances falls into this group (31%).

With X BE [asked] to (lines 6-9), the verb most commonly found is *asked* (22% of instances) but other verbs include *requested, invited, directed, forced* and *expected.* There is a lack of explicit source, which means that the speaker can be

implicated as the source of the obligation. This is why instances such as line 6 are sometimes counted as modal expressions in their own right in the literature (Perkins 1983). Line 9 is an instance of the a more marginal type where an official meeting is arranged which has the task of deciding a question; in this case it is the *premiers* who are expected or required to make the decision. These instances account for around 48% of X ʙᴇ [asked] *to.*

1	Secondly what I'd like, **want** both groups to do is **to**	think how	you would describe that person's performance in an informal situation
2	The Indian Gaming Regulatory Act of 1988 **requires** states to reach agreements with their tribes, which are sovereign nations, to	determine what	sort of gambling, and how much of it, is allowed on reservations .
3	And he **urged** the heads to	think how	they could bridge the gap between Britain 's best and worst schools.
4	By introducing a per capita tax, it was the government's aim to draw every adult's attention to exactly how much their local services were costing and to **encourage** them **to**	assess whether	they were receiving value for money.
5	In November 1971 the Council **set up** a committee to consider its future relationships with the colleges – '**to**	consider what	changes are desirable to afford greater independence to polytechnics and colleges in planning and operating courses leading to the Council's degrees'.
6	1. Impartial Guidance : Magistrates **are expected to**	decide whether	to grant access to parents, guardians or custodians, and, if they do so, to determine the conditions of access.
7	Shape-similarity (control) task . Subjects **were asked to**	judge whether	a Korean letter looked similar to a Korean target letter always present on the screen.
8	Representatives of the central government **were required to**	judge whether	or not these standards had been achieved.
9	The premiers of the 16 Lånder **are due to** meet on January 9th **to**	decide what	the quotas should be (some seem inclined to be far more generous than others).

Figure 5.7. Examples of X [ask] Y *to* and X be [asked] *to* expressions with [decider] + [judge] + *wh*

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Two formally distinct but functionally very similar expression types are *it* BE *for* X *to* (1.7 hits pmw) and X's [task] BE *to* (0.9 hits pmw). Some examples are provided in Figure 5.8. These expressions are similar because they focus on the responsibility rather than the entity responsible for carrying it out, but also identify that entity who is expected to judge the answer. In the case of *it* BE *for* X *to*, this is just the most frequent (66%) of three related expressions, including *it* BE *up to* X *to* (line 2) and *it* FALL *to* X *to*. These expressions construe the entity involved – *the court* and *the CPS* – as responsible for making a decision because of their status or position. The same applies for X's [task] BE *to*, except that the responsibility is labelled: *task*, *role*, *responsibility*, *duty* are all attested several times while *brief*, *job* or *requirement* only occur once. The related *the task of* is also included (two instances; see line 3).

1	If a prosecution were brought **it would be for** the court **to**	decide what	the statements meant.
2	i**t's up to** the CPS **to**	decide whether	to prosecute.
3	The guardian is given **the important task of**	assessing whether	this degree of understanding has been achieved.
4	Now you have the key to listening within. **It is your responsibility** and yours alone **to**	choose which	voice to listen to, which voice to accept as a guide throughout your daily life.
5	**Their role is** not to review the work on the files , but **to**	assess whether	the files comply with quality standards.

Figure 5.8. Examples of 'judging' verbs with X's [task] BE *to* and *it* BE *up to/for* X *to*

Around half of the instances are clearly reported, either because they are past, are attribute to a third party's opinion or are hypothetical (as line 1). There is only one

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instance (line 4) where the addressee is involved; these expressions thus follow the general trend with this meaning frame of finding expressions of obligation which implicate third parties.

Instances of lack of obligation are rare with this meaning frame; there are only 5 raw hits, which extrapolate to around 0.4 hits pmw. Three of the 5 instances are existential it BE *unnecessary/not necessary to* (line 1 of Figure 5.9). The other instances involve *there is no need to* and *not* HAVE *to*. In terms of 'other' instances, odd examples that do not really fit into any of the categories suggested, these are equally rare; an example of X BE *responsible for* is provided in line 2.

| 1 | **It is not necessary** for us in the present case **to** | decide whether | this distinction is a legitimate one and I do not think we should assume to do so. |
| 2 | but you may be **responsible for** exercising professional judgment about whether that's the appropriate thing that should be happening and perhaps | assessing whether | they're doing it properly |

Figure 5.9. Examples for lack of necessity and 'other' obligation with [decider] + [judge] + *wh*

5.2.2 The estimation of potential with [decider] + [judge] + *wh*

This section discusses expressions referring to potential with [decider] + [judge] + *wh*. As Figure 5.2 showed, this is a frequent type of meaning for this meaning frame, with over 20 hits pmw.

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The four main types of expression of potential whose frequencies and associations are the subject of this section are shown in Table 5.3. These extend beyond modal verbs and 'semi-modal' BE *able to* to existential expressions, where the potential is presented as being inherent in the situation, and 'enabling' expressions, which identify the enabling factor. These latter two types of expressions can be seen as complementing the meanings of the more familiar forms.

Table 5.3. Typology of expressions of potential

type	main forms
modal	*can, could, may*
able/ability	X BE [able] *to* X HAVE [ability] *to*
existential	*it* BE [difficult] *to* [way] *to / of*
enabling	X [enable] Y (*to*)

Figure 5.10 offers an overview in terms of frequency for each main potential expression type for [decider] + [judge] + *wh*. These figures are based on extrapolations from the sample (see Chapter 3). They are indicative of certain trends. Firstly, modal auxiliaries *can* and *could* (and a small number of instances of *may* and *might*) are more frequent than any other type, with negative (*can't*) outnumbering positive instances. In terms of objectified 'able' expressions (X BE [able] *to* and X HAVE [ability] *to*) and their negative forms ('unable'), these are less

frequent than modal verbs, as with all meaning frames; these are more likely to talk about ability than inability. With existential expressions of potential, introductory *it* expressions (labelled 'easy' and 'difficult') predominate compared to other types (e.g. 'way to/of', which represents expressions such as *there* BE *a* [way] *to/of* and 'difficulty', which stands for expressions such as *the* [difficulty] BE *to*). The likelihood of referring to difficulty or impossibility is far higher than that of talking about how easy it is to judge an answer. The other column in Figure 5.10 that is of interest is 'enable' (referring to 'enabling' verbs in the phraseology X [enable] Y (*to*)), the frequency of which indicates that it is fairly common to explicitly reference the 'enabling' factor with 'judging' verbs. Almost no instances of 'preventing' were noted.
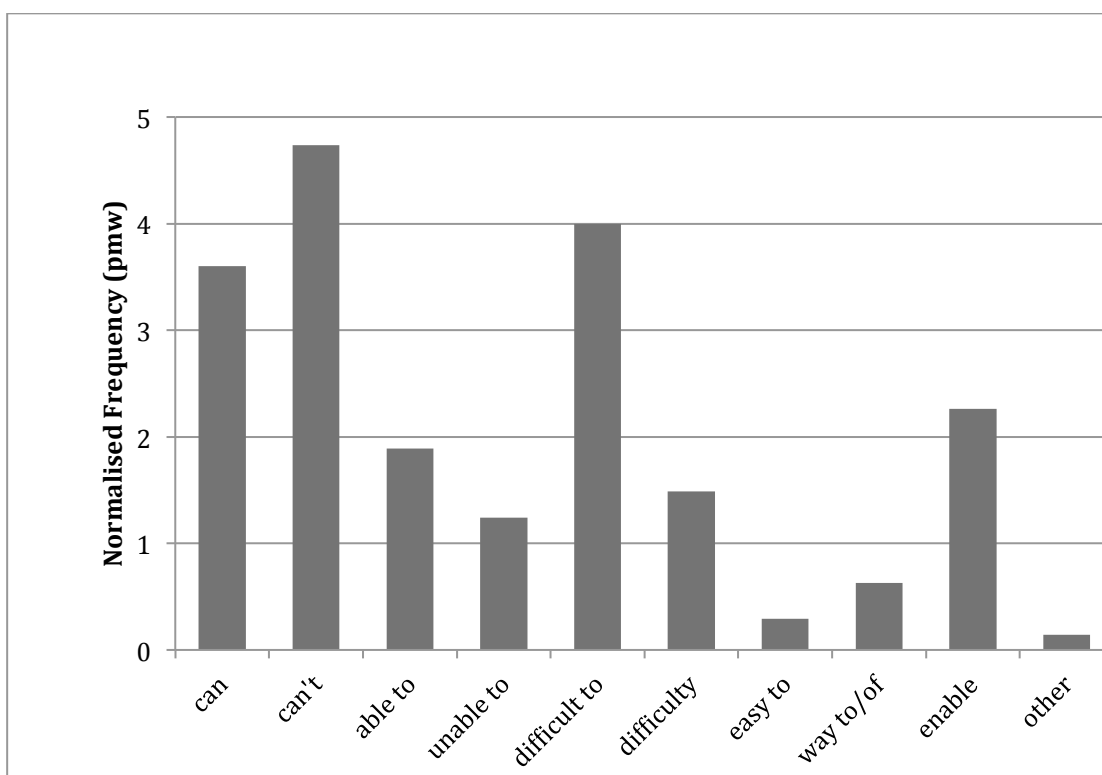
Figure 5.10. Distributions of exponents of potential with [decider] + [judge] + *wh*

The first set of examples (see Figure 5.11) show instances of modal verbs expressing potential with [decider] + [judge] + *wh*. With positive potential instances (around 3.6 hits pmw), the verbs most associated with modals are *choose* (16% of CHOOSE *wh* instances), *judge* (9%) and *tell* (14%); the modal *can* accounts for 84% of instances, *could* 14% and *may/might* 2%. Negative instances (4.7 hits pmw with this meaning frame) are most associated with *tell* (28%) and *predict* (17%); only *can't/cannot* (45%) and *couldn't/could not* occur (55%)*.

In these instances, the entity whose potential is being estimated is the subject-referent and the source of the potential is implicit. However, as with 'finding

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out' verbs, positive polarity instances tend to (nearly 80% of the time) provide an indication in the co-text of how the decision or judgement is made possible, for example by having information (lines 1 and 2) or that it is dependent on the subject referent alone (line 5). Nevertheless, there are instances like line 3 where it is not completely clear where the potential comes from. With negative polarity instances, in contrast, these indications, or reasons why the judgement is not possible, are less in evidence (around 35% of instances). One example is provided in line 7 where the judgement is not possible without more knowledge; the other examples merely present the subject referent as lacking the ability to judge.

1	I merely want the information *upon which* I **can**	decide whether	refurbishment can go ahead.
2	It is therefore necessary for the tests to include information regarding [...] *so that* the teacher or therapist **may**	judge whether	or not it is reasonable to use the distribution of sample scores as a basis for evaluating the performance of particular individuals.
3	Whereas more women than before **can**	choose whether	to work or not after the child-bearing years
4	But you **can** usually	tell when	he 's going to. **Cos** it sort of slightly
5	This is because it is *only* the school and its daily managers who **can**	assess what	it can afford -- and what it has to afford -- to do in terms of staff time and money
6	The model behaves *so much* like the real thing that the Berkeley scientists believe they **can**	predict what	would happen to the building during an earthquake .
7	A. I **can't** really	judge if	you're being selfish or not **without** knowing more about your circumstances .
8	They peered over ant-hills and looked cautiously round clumps of teazle. They **could not**	tell how	far away the ridge might be .
9	It was 7.10 p.m. Gaily **could not**	decide what	to do .
10	**No-one can**	predict how	long a person will live .

Figure 5.11. Examples involving modals of potential with [decider] + [judge] + *wh*

Figure 5.12 shows examples of 'able' and 'ability' type expressions with this meaning frame. In these cases, the speaker presents their estimation of whether a person has or does not have some kind of potential to make a judgement, or (in line 7), this potential is presented as important to this person. All the 'judging' verbs are found with these expressions, but *judge* (11.5% of **V wh** instances) and *predict* (12.5%) are particularly associated with them.

1	Martens said that van Basten, 28, will be out of action for at least four months, and only then **will** doctors **be able to**	assess if	he can return to top class soccer.
2	Without being in the least conceited about it, I soon **was able to**	judge whether	my cricket square was as good as some county grounds
3	In the absence of such evidence, the justices **were unable to**	assess whether	the last resort of making a secure accommodation order was justified
4	They [...] said that they **were not in a position to**	judge whether	his dismissal had been justified
5	Representing Dagenham , in east London, Mr Gould is seen by some colleagues as **well-placed to**	assess how	Labour can broaden its appeal to the communities that have rejected it at four general elections in a row.
6	**The ability to**	predict where	hostilities were likely to occur , in what countries [...] was paramount to a man whose professional abilities lay in being a practising soldier .
7	You'**ve then got the time to** look at your report	decide whether	it's suitable...
8	You **have the chance to**	decide which	of these three islands your group will live on .
9	She had enough nursing experience to know that Celia would recover physically, but she **had no way of**	judging how	much harm the episode might have done her mentally.

Figure 5.12. Examples of 'able/ability' expressions with[decider] + [judge] + *wh*

If we consider first the phraseology X ʙᴇ [able] *to* (including reference to inability), such instances occur around 1.5 times pmw; around 60% of these instances refer

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to ability and 40% to inability. While *able/unable* accounts for around 75% of these instances, other related forms are found; apart from the bolded items in lines 4 and 5 of Figure 5.12, there were also instances of *qualified to, hard put to it to, not sufficiently experienced to* and *too busy to*. There were also instances of *good at* (2 instances) and *capable of* (1). The examples (lines 1-5) also indicate the extent to which these expressions are suppletive in that they occur in environments where modals could not (around 55% of cases).

The concordance analysis yielded a range of other ways of referring to potential in more specific terms using nominal expressions mainly based on HAVE [ability] *to*. In total these occur around 1.5 times pmw, but individually the four expression types exemplified in lines 6-9 in Figure 5.12, involving having *ability* (including *capacity* and *expertise*), *time*, *chance* (or *opportunity*) and *way* (or *means*) are quite infrequent; the most frequent is (not) HAVE *time to* at 0.6 hits pmw; the others are all under 0.2 hits pmw.

Existential expressions of potential are relatively frequent with this meaning frame; considered as a whole, these expressions account for around 31% of all potential expressions, with a frequency of around 6.4 hits pmw. Examples are shown in Figure 5.13. It is six times more common to refer to a judgement being difficult or impossible than easy or possible. The judging verbs most associated with these uses are ASSESS (16% of **V wh** instances sampled for this verb are with existential expressions of potential), JUDGE (26%), PREDICT (28%) and TELL (17%). The most prevalent existential expression of potential (around 76% of cases) is the

introductory *it* expression *it* BE [difficult] *to* involving one of the adjectives *(im)possible* (26% of the time)*, difficult* (50%)*, hard* (11%)*, (not) easy* (11.5%). As these statistics suggest, few other adjectives are found - *straightforward*, for example, is attested once with this meaning frame. The related *it* BE *too early/soon to* (line 5 of Figure 5.13) is also found around 0.15 hits pmw; as with *it* BE [difficult] *to*, we can note that the reason why it is possible or impossible is provided in some cases (see items in italics in lines 1-5).

1	There is a clear consensus about the purpose of washing powders or mouse traps; **it's easy to**	judge whether	they are efficient, effective and provide value for money .
2	*Using a knowledge of* facies distribution, **it is possible to**	predict where	these potential reservoirs might occur
3	The right-wing reaction has been half successful, repudiating Keynes but not Beveridge. **It is difficult to**	assess whether	these trends will produce a lasting shift in the middle ground.
4	Izvestiya reported that some of the bodies that had been found were *so thoroughly* mutilated **it was impossible to**	tell if	they were men or women.
5	The E-culture has only been raving since 1986, *so* perhaps **it is too early to**	tell if	it can cause long term mental changes.
6	By Rita Carter . **There are two ways to**	tell when	an age-old phenomenon becomes a 'social issue'.
7	Once the Occupational Standards are finalised, an awarding body […] will look at **ways of**	assessing whether	an individual can meet the Occupational Standards or not.
8	It is certainly true that in many cases warts will regress and even disappear without any treatment , but it is unclear why this should happen and **there is no way of**	predicting which	sufferers will be able to rid themselves of the warts or how to stimulate the body 's defence to that end .
9	In addition , a continuation task will be used as **a further method of**	assessing what	is in the mind of the reader after reading a particular text.
10	Having decided to attend university **the next great dilemma is to**	choose which	one .

Figure 5.13. Examples of existential expressions of potential with [decider] + [judge] + *wh*

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Apart from adjectival expressions with introductory *it*, a range of nominal existential expressions were found based on *way of/to* and *difficulty* and semantically related nouns. The most frequent of these is *there* BE *no way of/to* in line 8 of Figure 5.13, with a frequency of 0.6 hits pmw with this meaning frame, rising to around 0.7 if we consider all instances of *ways/means* such as lines 6 and 7. There is also a range of nouns with similar meanings to *method* (*test, principles, indicators, rule, system, basis*) of which *criteria for/used in* is the only one to occur more than twice. While *way* predominates for negative instances (*no way of*), the variety of nouns found in positive instances is far greater. In terms of reference to *difficulty*, the main phraseology found in the concordance lines is shown in line 10, [difficulty] BE *to/in* It has a frequency of around 0.6 hits pmw with this meaning frame; other nouns are *difficulty, problem, art, knack, task, issue* and *struggle*. As the examples show, one feature of these nominal expressions compared to similar clauses with modal verbs, apart from avoiding reference to whose potential is involved, is that the noun itself can be qualified as, for example *great* (line 10), pluralised or be the object of a verb (line 7).

Another way of referring to potential is to use an 'enabling' expression to focus on the source of the potential. These expressions explicitly identify the source of the potential as its subject, an option which is not available with other expressions of potential. The verbs most associated with this way of expressing potential are ASSESS (6% of **V wh** instances for this verb), JUDGE (5%) and PREDICT (8%).

With 'judging' verbs, just over half of these are in the phraseology X [enable] Y (*to*) (see Figure 5.14 lines 1 and 2), with a frequency of around 1.2 hits pmw; ENABLE and HELP are the enabling verbs most often found (31% and 63% of these cases, respectively), with just a few instances of ALLOW and LET. A further 25% are in the phraseology seen in lines 4 and 5, X MAKE *it* [difficult] *to*, which here is more than twice as often used to refer to difficulty than possibility. The other lines in Figure 5.14 show other, minor expressions (no more than 0.2 hits pmw), where either *time*, *opportunity/chance* or *means/tools* are provided to enable a judgement to be made. The lines as a whole also give an idea of the typical enabling factors for making an assessment, whether it is providing information (line 1), (research) results (line 3), other types of information (line 4), or a tool of some kind (line 7).

1	Giving marks for written work can **help** the student **to**	assess how	well he is doing and can serve as reinforcement
2	The government's declared aim is to **enable** parents to	judge how	well teachers, schools and LEAs are performing
3	Our results now **make it relatively straightforward to**	predict where	phosphorylation might be occurring in these proteins .
4	there was a sharp dip in credit use when control was re-imposed at the end of 1973. **This makes it difficult to**	tell whether	HP and other retail credit , as a part of consumers ' overall spending , is now increasing or declining.
5	Instruct the LH to make a pause after each pair to **allow you time to**	decide where	to put the tick .
6	They **give the opportunity to**	judge whether	the driving system is suitable for the new user , and whether it is irritating and over-protective of the experienced user
7	the analysis does not **provide** us with an ex ante **tool** with which to	determine which	group a case should fall into

Figure 5.14. Examples of 'enabling' expressions with [decider] + [judge] + *wh*

This survey of the expression of potential with instances of 'judging' verbs has

shown how particular resources relating to this meaning area are associated with particular verbs to extend the range of expression of modal verbs *can* and *could*. One conclusion is that expression of potential is associated more with 'judging' instances – and the related verbs, e.g. ASSESS, JUDGE, PREDICT and TELL – that refer to evaluation of a situation rather than a decision on action.

5.2.3 The expression of volition and purpose with [decider] + [judge] *+ wh*

Figure 5.2 showed that instances of 'judging' verbs with exponents of volition and purpose were found to be somewhat less frequent compared to obligation and potential, with a frequency of around 6.8 pmw (around 9% of all instances of this meaning frame). This section will look in more detail at specific means of realising these meanings, based on the types shown in Table 5.4. In terms of volition/intention, beyond modal verbs and semi-modals, the other types of expression tend not to commit the subject to the action to the same degree while indicating to a more specific degree whether volition, intention or objectives are involved. 'Trying' and 'purpose' instances in turn implicate goal-oriented action which is to some degree uncertain as to its result.

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Table 5.4. Typology of expressions of volition and purpose

Type	Main forms
modals, semi-modals	*will, would, shall,* BE *going to*
willing to	BE [willing] *to*
wanting	[want] *to*
aim be to	[aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose clause	*(in order) to* USE X *to*

The extrapolated frequencies of these different types with [decider] + [judge] + *wh* are shown in Figure 5.15. It is clear that there are very few instances of verbs with *to*-infinitives ('want to'), adjectival expressions ('willing to') and nominal expressions ('aim be to'). Since these are the clearest instances of the expression of volition, this shows that it is quite unusual to announce or report an intention or desire to decide or judge the answer to a question. However, there are greater frequencies of instances relating to purpose, suggesting goal-directed decisions and judgements.
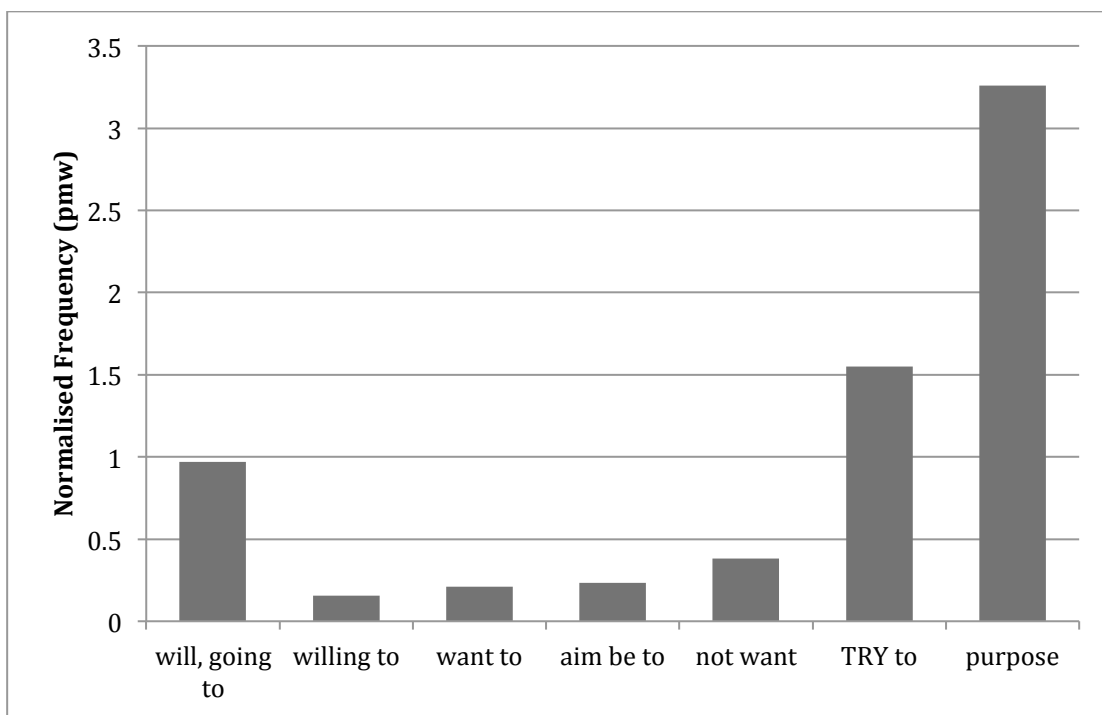
Figure 5.15. Distributions of different exponents of volition and purpose with [decider] + [judge] + *wh*

Figure 5.16 includes instances of volitional *shall* and *will*; there is also one instance of BE *going to* in the sample. There are in fact few instances on which to draw conclusions (the raw count is 16, which extrapolates to 0.96 hits pmw); it should be recalled that a number of instances of *will* were analysed as referring to *obligation* (see Section 5.2.2). We can note first person 'commitment' instances (line 1) account for around 36% of the total. Instances which refer to the current *study* or *chapter* also effectively commit the researcher or writer to carrying out the assessment or promise to reveal the missing information as in line 2; these are rare with this meaning frame (3% of instances). The largest group (61% of instances) refers to the intention of a third person or group (lines 3 and 4). In these

cases, the volition reading is dependent on co-textual clues such as *his intention is to* in line 3 (others include reference to *commitment to* or being *ready to*), or, in instances like line 4 the *wh*-clause analysis – here we have a directive infinitival *wh*-clause which in conjunction with 'judging' verbs relates to a decision on one's own actions. In both lines 3 and 4 the decision to be made is one that relates to the proposed future actions of the 'decider' which only they can decide.

1	The hon. Gentleman asked about three questions and I **shall**	choose which	one to answer.
2	The *study* **will** also	assess whether	such rational management systems are presentational devices, as some critics claim
3	His *intention is to* take a complete break from the game for three years [...]. After that he **will**	assess how	rugby might figure again in his life.
4	The Midlothian centre is, however, continuing to provide a reduced range of course options and **will** next month	consider how	*to ensure* its future in residential and non-residential courses , seminars and conferences.

Figure 5.16. Examples of volitional *will / shall* with [decider] + [judge] + *wh*

The means of referring to volition other than with modal verbs with this meaning are even less well represented. They show similar patterns to those seen in Chapter 4 for [knowledge-seeker] + [find out] + *wh*. This may be because most of these instances involve ASSESS *wh*, instances of which were included in this meaning frame but at the same time show affinities with instances of 'finding out'.

In terms of verbs with *to*-infinitive complementation (lines 1-3 of Figure 5.17; 0.2 hits pmw), only WISH, SEEK and SET *out* were found. These verbs suggest a lower level of commitment than *will* but like *will* are used to report others' aims.

They provide a wider range of time reference (line 3). It is also worth noting that the 'purpose' relation in line 2 closely parallels those found with *to*-infinitive purpose clauses; this instance could be paraphrased as '*in order to assess how exclusions might happen, we must understand how the structure…*'. Examples such as this provide support for the inclusion of 'purpose' clause instances with 'volition'.

Nominal [aim] BE *to* instances (lines 4-6) extrapolate to around 0.13 hits pmw; the nouns shown here, *aim, purpose* and *objective* are the only ones found and are fairly evenly distributed. We can note also that only around half of these relate to the aims of the writer as the person carrying out the study; the others relate to the aims of other studies or enterprises.

The expression type illustrated in Figure 5.17 offers several syntactic and semantic advantages to writers including the option of introducing lists of aims (line 4) and avoiding mention of the human participants in research (also line 4; line 6). Line 7 is an example of a closely related and relatively fixed expression already noted in Section 4.2.2, [research (tool)] + BE *designed to*, which relates to the aims and objectives of research, whether carried out by the writer or another party and occurs around 0.1 times pmw with this meaning frame.

Lines 8 and 9 are included to show examples of expressions with adjectives and derived nouns (*determination*) that are rare in general with **V wh** and in particular with 'judging' (around 0.16 hits pmw).

1	The research **seeks to**	assess how	the present police policy-making process compares with the 1964 Act
2	I recognise the importance of these processes, but if we **wish to**	assess how	exclusions might happen *we must understand* how the structure of the National Curriculum generates cases for exclusion.
3	In a new survey on 'National Orchestra Provision', due to be published in July , the BBC and the Arts Council **have set out to**	assess how	well this musical plenty reaches audiences and how the number of concert-goers can be increased.
4	Objectives **The objectives of** the proposed study **are** as follows: […] 4. **to**	judge whether	parents at are a disadvantage in court
5	The sweltering 'pit' deals in shares, bonds and other securities all over the world and **the aim is to**	predict how	the financial market will stand in the future .
6	Welfare economics is the branch of economics dealing with normative issues. **Its purpose is** not to describe how the economy works but **to**	assess how	well it works.
7	The crime survey carried out in Islington, by contrast, **is designed to** be explanatory and to	predict who	is most at risk (Jones, Maclean, and Young 1986).
8	Having talked to James Jonah following his visit and having seen the national reconciliation plan, **I am prepared to**	consider what	is necessary .
9	This will involve [...] **a determination**, particularly on the part of the Home Office and Department of Health, to	consider how	they could create policies and incentives, financial and otherwise, to encourage a shift in the right direction.

Figure 5.17. Examples of expressions of volition apart from modals with 'judging' verbs

Instances involving 'trying' items are shown in Figure 5.18. These were originally based on the verb TRY *to* and ATTEMPT *to* as verb and noun, but some other forms were found to express similar meanings in the concordances lines, none of them occurring more than once with this meaning frame: STRUGGLE *to*, *our efforts were directed towards*, and *their convictions were engaged in*. These instances extrapolate to a frequency of around 1.55 hits pmw with this meaning frame. With

these instances there is reference to some kind of goal-directed activity taking place but there is also no commitment as to the success of the attempt.

As with 'finding out' verbs, the majority of instances (around 77%) of 'trying' instances with [decider] + [judge] + *wh* involve TRY *to*; these are almost invariably (98% of the time) in the *-ing* form of the verb, suggesting the degree of effort involved and thus an element of difficulty in achieving the aim (see also *far too much energy ...* in line 2), a meaning also noted by Hunston (2011). Most of the remaining instances (20% of the total) involve verbal ATTEMPT *to.*

1	Some have a maximum/minimum facility too which is useful when you **are trying to**	decide whether	the temperature is on the rise or fall.
2	Far too much scholarly energy has been wasted in **trying to**	assess what	would have happened to industrialization without the railways.
3	James, meanwhile, **was trying to**	predict what	number he would get by adding the squares of two consecutive numbers in the sequence .
4	It is this entropy change which , along with the enthalpy change of the reaction, we must consider when **attempting to**	predict whether	a chemical reaction will proceed spontaneously or not .
5	McLean quotes Mueller's definition, according to which it [public choice theory] is 'the economic study of non-market decision-making' (1987, p.1). In particular, it **attempts to**	assess how	rational decision-makers will act in certain situations
6	It was decided to enlist the help of East Hampshire District Council **in an attempt to**	assess how	best to tackle the problem.

Figure 5.18. Examples of 'trying' exponents with [decider] + [judge] + *wh*

The close association between 'trying' instances and those including purpose clauses can also be seen in instances such as lines 3 and 6: both involve the

purpose relation and the semi-fixed phrase *in an attempt to* is close in meaning to *in order to.* At the same time, instances involving non-progressive ATTEMPT such as line 5 show a close association with want-type instances – *aims* would seem an acceptable paraphrase for *attempts* here.

Figure 5.15 showed 'purpose' clauses are by far the most frequently found means of referring to decisions or judgements. These almost invariably consist of *to*-infinitives in adjunct purpose clauses; these instances may include *in order to* (15% for this meaning frame) and have been associated with modal meaning (e.g. Givon 2001; Hunston 2011). Very occasionally, other expressions of purpose are encountered, such as *with a view to -ing* (one instance in this meaning frame)*.* Purpose clauses with [decider] + [judge] + *wh* have a frequency of around 3.26 hits pmw; the verb most associated with this meaning is ASSESS, with around 21% of its **V wh** instances; JUDGE and PREDICT (around 7% each) show lower associations.

It is possible to discern certain common meanings of the main clauses in such instances. Figure 5.19 gives an idea of the main meanings: (needing) information or knowledge, including understanding (line 1; around 10% of instances); considering or assessing prior to judgement (line 3; 36% of purpose instances); carrying out a research activity (line 2; 14%); using rules, criteria or information (line 4; 20%); going somewhere (line 5; just over 1%);. Some instances are hard to place (e.g. line 6).

1	Employees *require information* **to**	determine whether	[...] to work for a public sector agency
2	A further *series of experiments was performed* **to**	assess whether	colonic bacteria could contribute to measured metabolism.
3	All the relevant facts were before the two magistrates who *were weighing them up* **to**	decide whether	it was more likely than not that there was prejudice and unfairness that led to an abuse of the process.
4	There was no clear theory of jurisdiction and it was impossible to draw up a set of rules which *could be used* **to**	predict when	the courts would intervene .
5	They *will be* there this weekend to	judge who	might be right .
6	South Tees Health Authority *has agreed to* fund the scheme for one more year **to**	assess how	it integrates with the work of other agencies.

Figure 5.19. Examples of infinitive of purpose with [decider] + [judge] + *wh*

The modal meaning of these types of instance is at least partly dependent on the meaning of the main clause. In the majority of cases, the main clauses themselves indicate that the necessary information is not yet available or the activity has not yet been carried out, so the dependent judging or assessing also cannot have been done. The main clauses include the types of modal expressions that are the focus of this study (e.g. *it is essential to*) or modal verbs (*will*) or combinations of the two (*might be able to, can attempt to*). In contrast, where the main clause has past time reference, as in line 2, the uncertainty over the assessment seems less acute; these instances are less 'modal'. These past instances account for around 11% of the total for this meaning frame.

A subset of purpose clauses (12%) indicates that the subject referent stopped, or more often, did not stop their current activity to make a judgement. An example of this use is shown below in (2). Around half of these have some marker

of modality – usually of uncertainty, as here (*certainly*).

(2)   He was not reckless exactly, but he *certainly never stopped* **to consider whether** that loss was too great to hamper expansion.

There were very few instances (5 in total) of lack of volition or not attempting with this meaning frame (around 0.4 pmw). Three of these are adjectival, as line 1 of Figure 5.20 (there is also one instance of REFUSE *to*). The only instance of lack of attempt is shown in line 2. In this case the speaker attitude is emphasised by the use of *any*.

1	**No one** in the Labour Party *seems* **prepared to**	consider why	more than 14 million people, including many of the very poor, voted Tory.
2	The current guillotine motion, however, has been introduced **without any attempt to**	decide whether	it was necessary.

Figure 5.20. Examples of 'refusing' or 'unwillingness' with [decider] + [judge] + *wh*

5.2.4 The expression of uncertainty with [decider] + [judge] + *wh*

This meaning frame does not occur at all frequently with expressions of uncertainty, with only around 1.6 instances pmw in total. Figure 5.21 indicates the distributions of different types of expressions; we can see that modal verbs of uncertainty (*will, would, may, might, must*) account for the majority of instances.

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The other figures are based on small numbers of instances (only 12 raw instances in total) and so are not very reliable.
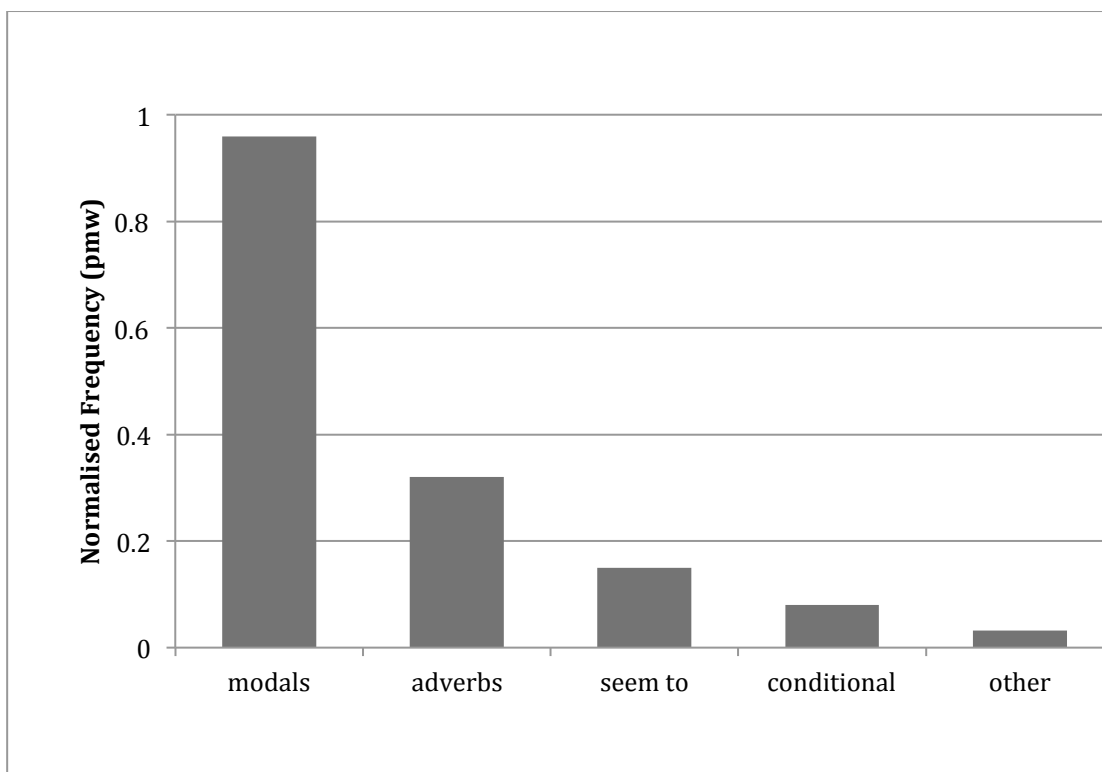
Figure 5.21. Distributions of exponents of uncertainty with [decider] + [judge] + *wh*

As we can see from Figure 5.21, [decider] + [judge] + *wh* instances occur with a range of modals of uncertainty: around 55% of instances are with *will*, 16% with weaker *may* and 26% with (hypothetical) *would.* Over one third of these modal instances combine with some kind of harmonic expression such as *hoping that* in line 3, which in this case adds to the meaning by suggesting desirability. However, there is invariably some other signal of uncertainty in the co-text (though not always in the same sentence): in line 1, the progressive form has been associated

with uncertainty (Coates 1983), but also this is a prediction based on circumstances (*with the new season only a few months away*); in line 2, *easily* suggests a prediction, but this sentence is part of a paragraph (BNC file EW4 1001-1011) in which other modals signalling uncertainty (*must, may, would, shall*) are found in almost every sentence.

1	WITH THE new season now only a few weeks away , clubs **will be**	assessing how	they can best update or improve their facilities.
2	In Ireland a party that puts up several candidates in a constituency **will** easily	predict which	of them are going to be elected , which may and which won't .
3	Sociable Dorothy […] managed to infuse some sort of order into Isobel's shattered life, *hoping that* soon Isobel **would**	decide what	she would do in the future , so that she herself could go back home to Wales ,
4	[...] Foreign Secretary Douglas Hurd dithered on the pavement for a few seconds, **presumably**	wondering whether	to brave the cameras but thought better of it and he , too , entered by No 12.
5	Unlike many other parasites which […] the Laboulbeniales **seem** almost carefully **to**	choose where	theirs are placed.

Figure 5.22. Examples of the expression of uncertainty with 'judging' instances

No other expression of uncertainty was found in more than 3 instances. Two examples are shown in lines 4 and 5 of Figure 5.22. Line 4 involves the modal adverb *presumably* (*seemingly* was also found), which indicates here an inference based on evidence, like SEEM *to* in line 5.

5.2.5 Negative [decider] + [judge] *+ wh*

Only around 2% of instances of this meaning (a frequency of around 2 pmw) frame

are straightforwardly negative, referring to a judgement not made. Examples can be seen in Figure 5.23.

1	She did not	consider what	he might do to rescue her. That was his affair.
2	'the Judge *erred* because he was influenced by the views of the parents, instead of	deciding what	was in the best interests of the child'.
3	Pyramid says it hasn't	decided whether	it will offer the one-to-four MIPS R4000MP-based low-end servers […] directly -- it 'll probably let its OEMs handle those.
4	He had not yet	decided whether	she would be friend or enemy , so his eyes were distant -- and she knew it.

Figure 5.23. Negative examples of [decider] + [judge] + *wh*

As we can see, as well as grammatical negative *did not* in line 1, other means of expressing negatives are included such as *instead of* (line 2). While the failure to make a judgement may be seen as simply unnecessary to the subject referent (line 1), it may also imply criticism (*erred* in line 2). Around 50% of the instances are of the type seen in lines 3 and 4, where the decision has not (yet) been made, but may come soon. These instances only involve the verbs DECIDE and DETERMINE. Thus, even in cases where negative forms are used, there is commonly an element of speaker attitude.

5.2.6 Indicative [decider] + [judge] *+ wh*

Instances where there are no modal markers are not strictly of interest to this study although it is of some interest to compare how the proportions of them vary across

meaning frames. In the case of 'judging' verbs, indicative instances occur about 12.2 times pmw, accounting for around 16% of instances. The verbs DECIDE (14% of instances), CHOOSE (11%), and CONSIDER (10%) are those most likely to occur in indicative forms. Some examples are provided in Figure 5.24. There are three main patterns of usage here. In the first one, which accounts for around 40% of instances, the focus is on the 'decider' as the one who makes the decision (lines 1-3). It mainly involves the verbs DECIDE, CHOOSE, ASSESS and JUDGE. A second pattern, involving only DECIDE, JUDGE and CHOOSE is seen in lines 4 and 5, where the focus is more on how the judgement was made (see bolded items).

1	GPs currently	assess whether	people are incapable of carrying out their job and therefore able to claim benefit.
2	This has always added to the clergy's spiritual authority and status, and has tended to merge with the authority claimed by the clergy in matters of faith and morals, with the high clergy	deciding what	constitutes matters of faith and morals.
3	As all year 9 pupils throughout England	choose what	subjects they are going to take for G.C.S.E. St Aidans wasn't any different.
4	Didi	judged whether	a thing was good or bad **by how much** it would sell for.
5	They followed a pattern which was virtually invariable, for Haussmann	decided what	the optimum height should be **in relation to** street width and perspective
6	The Echo revealed yesterday how Reds' boss Souness was	considering whether	to opt for Hooper's experience in the Cup Winners' Cup second round, second leg
7	I asked her how she was, she said, 'Pretty mouldy.' While I was	thinking how	to respond, she said, 'Oh, how I long to be gathered'
8	I was nevertheless disappointed that my theories had proved to be groundless. I	wondered where	to go from here.

Figure 5.24. Examples of indicative [decider] + [judge] + *wh*

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The other usage with this meaning frame (50% of instances), associated in particular with CONSIDER and WONDER, can be term 'question-oriented', in that the decision is not yet made but under consideration. As we can see in Figure 5.24, the verbs tend to be in progressive forms, with the exception of the inherently question-oriented WONDER.

5.2.7 Other [decider] + [judge] *+ wh*

A number of instances (around 10% of the total) could not be placed with the categories above. Nearly 70% of these refer to factors or information that are or should be taken into account in or before coming to a decision. Some examples are provided in Figure 5.25.

1	failure to respond to a community order **must be disregarded when**	considering whether	an offence is sufficiently serious to justify a custodial sentence (s.29(1))
2	Finding out the expectations of clients **is important in**	assessing how	readily they will take to an educational self-help approach.
3	And both of those factors **can be important in**	judging how	the system 's doing.
4	As usual, we **need to have a clear view of** precisely what we are trying to summarize **before**	deciding which	measure does the job best . Alternatives : ratios of proportions and odds

Figure 5.25. Examples of the phraseology [take] X into account *in / before / when* [judging] *+ wh*

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5.3 The meaning frame [thinker] + [imagine] + *wh*

The second meaning frame presented in this chapter, [thinker] + [imagine] + *wh* is based on mainly on the verbs GUESS, IMAGINE, THINK and WONDER with a few instances of CONSIDER and QUESTION (around 7% of **V wh** instances of these two verbs). These verbs refer to mental processes and are thus commonly grouped together as such, as shown in Table 5.5. However, in the majority of instances of these verbs in the **V wh** pattern, the aim is to draw attention to the rhetorical nature of the embedded question, that is that the answer to it is in some way presented as having a special status; this type of *wh*-clause was noted in Section 2.6.2. A minority of instances focus more on the mental effort involved in thinking of an answer to the embedded question.

Table 5.5 shows how the verbs included in this section are grouped in other studies. All the verbs in the THINK group in Francis et al. (1996) and Biber et al.'s Cognition verbs[1] (1999), which are also in this study are provided to indicate other verbs that can be seen as sharing elements of the same meaning. The analysis of concordance lines of these verbs suggests that a distinction can be made between 'judgement', 'knowing' and, in the case of this meaning frame, 'imagining'.

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[1] after removing those Biber et al. subsequently refer to as relating to 'discovery'

Table 5.5. 'Thinking' verbs in different studies.

study	meaning groups	example verbs
Karttunen (1977)	verbs of conjecture	*guess, predict*
Francis et al. (1996): V wh	THINK	*care, consider, decide, determine, forget, guess, imagine, know, mind, predict, remember, see, think, understand, wonder*
Francis et al. (1996): V wh-to-inf	DISCOVER DECIDE	*guess, think* *imagine*
Biber et al. (1999)	Cognition verbs	*assess, consider, decide, find out, forget, guess, imagine, know, learn, predict, realize, recognize, remember, think, understand, wonder*
Trotta (2000)	Perception/Reflection	*consider, hear, imagine, see, wonder*
Huddleston & Pullum (2002)	Guessing	*guess*
current study	[thinker] + [imagine] + wh	*consider, guess, imagine, question, think, wonder*

Those verbs interpreted as having senses relating to 'judgement' have already been classed in the [decider] + [judge] + *wh* meaning frame (see Section 5.2). It should be recalled that CONSIDER, THINK and WONDER featured there, although THINK and WONDER only with direction *wh*-clauses. Verbs relating to 'knowing' and 'caring' are dealt with in the next chapter.

As already noted, the feature that emerges from concordance analysis of IMAGINE, GUESS and WONDER that led to the formulation of this meaning frame was the presence of what were termed 'special' *wh*-clauses in Section 2.6.2 These *wh*-clauses, in contrast to 'genuine' ones, share certain features which allow a speaker or writer to draw attention to the (nature of the) answer to the *wh*-clause question,

whether it is surprising, suspected or unknowable. At times, this interpretation will depend on the meaning of the verb; WONDER and QUESTION in particular promote this kind of interpretation. Examples of these *wh*-clause types with the verbs in question are shown in Figure 5.26. Lines 1 and 9 show examples of 'biased' embedded questions, where a particular answer is suggested as more likely (note the co-textual clue, *possible*, provided in line 1). There are also examples of rhetorical or emphatic *wh*-clauses in lines 2 and 3 (see highlighted items) as well as *wh*-exclamatives (lines 4 and 6). Finally, instances were noted where the subject-referent seems to suspect the answer and have some kind of emotional response to it, as indicated by the lexis relating to emotional reactions and the modal verbs in the *wh*-clauses in lines 5, 7 and 8.

1	He	wondered if	the new owner were a confidant of Ballater. Possible .
2	Christina took a big gulp of champagne, and	wondered what	**on earth** she was going to find to talk about all evening with this woman.
3	He realized now what solitary confinement must be like and	wondered how	people **could** survive months, even years of it.
4	I used to wonder just what the kestrel was looking at [...] and I'd	imagine how	wonderful it must be to be suspended in mid-air, looking down on the Earth
5	A **faint, ironic smile** played about her mouth as she allowed herself [...] to	imagine what	the weekend **could have held** if she had been one of Dane's legion of devoted followers.
6	Richards suddenly saw this, and he	guessed how	erodingly lonely the man must be.
7	She **shuddered** when she	thought what	her fate **might** have been .
8	the **courage** of the outside directors **failed them** when they	considered what	announcement of such a deal **might** do to the IBM share price.
9	She	questioned whether	what they lacked was **not** ruthless ambition.

Figure 5.26. Examples of [thinker] + [imagine] + *wh*

Not all instances of these verbs are of this rhetorical type; some non-rhetorical ones are shown in Figure 5.27. In these examples, the meaning of the verb could be glossed as 'try to imagine'.

1	He	wondered how	Plato would have advised him .
2	Never batted an eyelid when we were all	wondering where	Gebrec had got to ... although she did react rather oddly when Dieter showed up
3	All through the short plane journey she'd been	imagining what	it would be like to meet Rune again socially . How would he greet her -- as a friend or a near stranger ?
4	I	thought how	the baby would look if it were born now
5	Sentence (2) leaves us in mid-air,	guessing what	the " thing " may be that Pemberton would like to hear "

Figure 5.27. Examples of [thinker] + [imagine] + *wh* (not rhetorical)

As we will see in this section, the typically 'rhetorical' uses of [thinker] + [imagine] + *wh* have an effect not only on the types of modal expression that occur but also on the meanings of the phrases that result. Figure 5.28 shows that most instances are not modal, but indicative; this is due largely to the influence of the question-orientied verb WONDER, which only co-occurs with modal expressions in around 11% of instances. At the same time, there are still appreciable numbers of instances with potential, obligation and uncertainty, all of which show quite interesting patterns of use. The following sections will discuss these different categories of meaning.
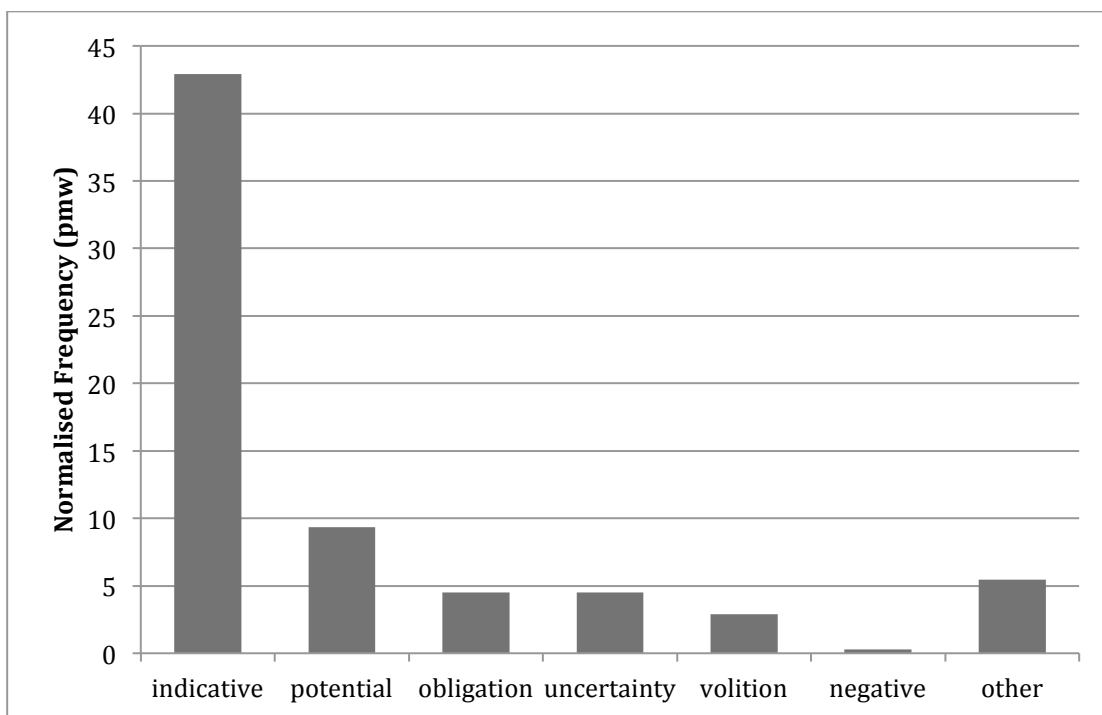
Figure 5.28. Distributions of modal and non-modal meanings for [thinker] + [imagine]

5.3.1 The expression of obligation with [thinker] + [imagine] + *wh*

As indicated in Figure 5.28, obligation is not particularly common with this meaning

frame, with a frequency of around 4.5 hits pmw (around 6% of all instances). The

distribution of different means of expressing obligation is particularly extreme for

this meaning frame compared to others. As Figure 5.29 indicates, a large majority

(over 80%) of instances involve imperatives; around 83% of these are in

combination with 'special' *wh*-clauses to draw attention to an idea rather than raise

a question which needs to be answered. What is also striking about this meaning

frame is the very small number of instances with modal verbs of obligation such as

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must and *should.*
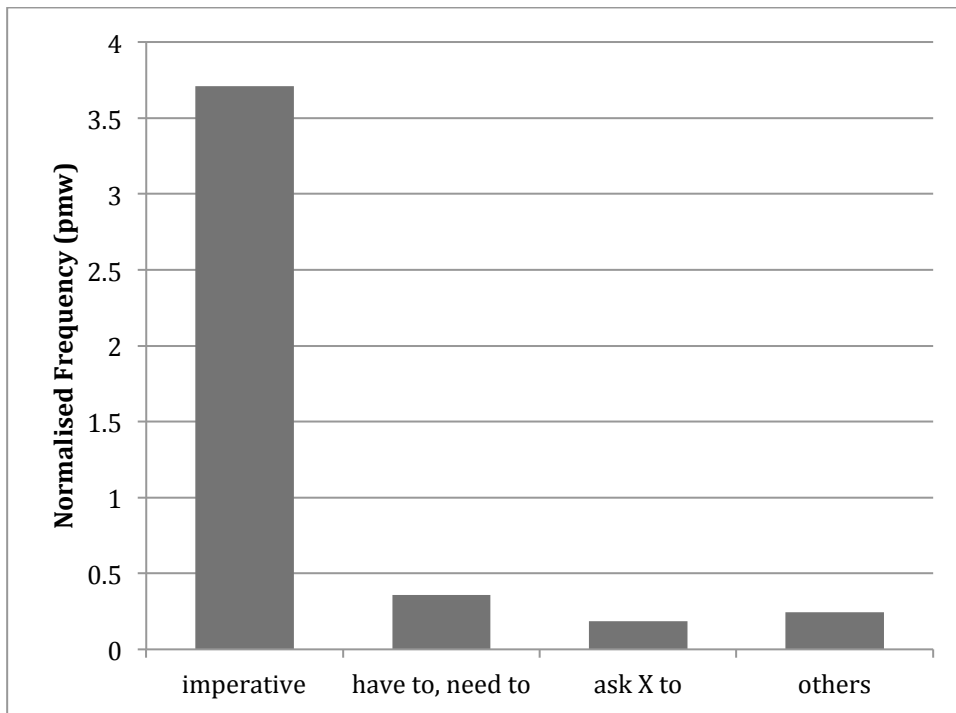
Figure 5.29 Extrapolated distributions (pmw) of obligation for [thinker] + [imagine]

The examples in Figure 5.30 show instances of 'thinking' verbs in the imperative, the predominant way of expressing obligation with this meaning frame. The verbs IMAGINE, GUESS and THINK are all fairly strongly associated with the imperative, with between 13% (imagine) and 18% (guess) of their **V wh** instances being in this form. As the examples indicate, these instances are strongly associated (83% of the time) with 'special' *wh*-clauses, that is, those where the answer is either implied, or no answer is expected. Generally speaking, instances with imperative *imagine*, *think* and *consider* serve to emphasise the extreme nature of the

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information implicit in the *wh*-clause, and exclamative clauses are quite common (around 30% of instances); in lines 1, 2, which are examples of exclamatives, we can see that in both cases the answer is implied – that it will be very hard in line 1 and it was a very formidable task in line 2. Even where the *wh*-clause is not formally a *wh*-exclamative, as in lines 3 and 4, the answer is implicit. In contrast, instances with *guess* often have the function of priming one's interlocutor to expect news in what Schegloff (1988) calls 'pre-announcements' (lines 6 and 7). Schegloff observes that a normal response to *guess wh* interpreted as a 'pre-announcement' would be to repeat the *wh*-word (line 7), although in some cases one may be able to guess the information (line 5) so the answer is left implicit[1]. Alternatively, as in line 6, the interlocutor is given no opportunity to respond as the answer is provided immediately.

Lines 8 and 9 show two examples which do not fit this pattern. Line 8 is a usage which appears confined mainly to *guess* in referring to guessing games. Line 9, meanwhile, is one of a very few examples of imperative forms in this meaning frame that follow the pattern seen in other meaning frames in expressing advice and having another imperative in the following sentence. It is noteworthy that it is one of only two examples of imperative *try* with this meaning frame. Similarly, *let's* is only found twice with this meaning frame.

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[1] A further 39 instances of *guess what* and 2 of *guess how much* have been excluded from the study since no question was retrievable from the context, for example:
Guess what? You know I always borrow everyone's pen, I went and bought myself a new one <unclear> just like Josie's one.

1	Just	imagine how	hard it will be for Heathcliff when you marry Mr Edgar!
2	Bearing in mind the difficulty that you may have had even in locating a book on the shelves in your room,	imagine what	a formidable task it is to arrange hundreds of thousands of books in a college library in such a way that each reader can quickly find a particular book or publication on a particular topic.
3	According to the Health and Safety Executive it costs British Industry more than £2 billion a year in absenteeism.	Imagine what	that means for your company. You can't avoid stress, of course.
4	Just	think what	we could achieve with enough investment.
5	When he knocked on our door the older detectives wouldn't answer it. So	guess who	did! Now, my desk was not too far away, after he'd knocked twice I used to get it .
6	A and yesterday	guess what	we found? Something that we've been looking for for months and months
7	**A-**	Guess where	Lisa is now? **B-** Where?
8	Rakes, pounders, sticks , boxes and sieves will all produce interesting shapes and tracks in the sand, leading to guessing games such as, '	Guess what	I did this with'. Marks made by feet can be compared .
9	When other people are taking the mickey out of someone else, try to	imagine how	they feel about it. Don't join in if it is getting hurtful .

Figure 5.30. Imperative examples of [thinker] + [imagine]

While the main means of expressing obligation with this meaning frame involves imperatives, there are some instances of other ways; examples are shown in Figure 5.31. With HAVE (*got*) *to* (0.4 hits pmw), more than 80% of instances involve the verb *guess* and more than 60% refer to the rules of guessing games or activities (lines 1 and 2), although the obligation may be presented as deriving from the situation (line 3). There are also some instances of X [ask] Y *to* (0.2 hits pmw): in line 4 the reported obligation was imposed by the researchers, while in line 5, we

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do not know who asked *Liz* because the passive form is used. These two instances in fact tend to indicate that the choice of active or passive is at least partly decided by who is important in the discourse at that moment: *the research team* in line 4 and *Liz* in line 5. Line 6 gives an example of a rather indirect, or tentative introductory *it* construction combined with *trying to* used in giving advice in combination with an *if*-conditional clause. None of these examples involve 'special' *wh*-clauses and indeed they overlap in terms of meaning with [decider] + [judge] + *wh* instances.

1	Mm . And you'**ve got to**	guess how	much it will weigh.
2	After five people have been 'killed', the chosen person **has to**	guess who	is the murderer . 19 Squeak piggy squeak
3	The conflict is often hurtful for the family or close friends, who **have to**	guess whether	the creative member wants company or not .
4	A research team at Birmingham University asked women to look at magazine pictures of catwalk beauties and then **asked** them **to**	guess how	wide the models were.
5	Liz **was asked to**	imagine how	she would respond if she was faced with the same problems again.
6	If the water is very low when you are constructing your map **it is worth trying to**	imagine what	the water will be like during a winter flood .

Figure 5.31. Examples of obligation with [thinker] + [imagine]

The picture that emerges of obligation expressions with [thinker] + [imagine] + *wh* is that the means of expressing a particular modal meaning will vary quite considerably depending on the meanings of verbs, or, more accurately, meaning frames. It is possible to make this conclusion based on differences between the exponents of obligation found to co-occur with 'thinking' verbs compared with those

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co-occurring with 'finding out' and 'judging'.

5.3.2 The estimation of potential with [thinker] + [imagine] *+ wh*

It was shown in the previous section that instances of this meaning frame have quite distinctive uses with obligation expressions, tending to emphasise the interactive nature and/or shared nature of the knowledge (Hunston 2000), and having a strong association with imperative clauses. This theme of distinctiveness continues with expressions of potential with [thinker] + [imagine] + *wh*.

The main means of expressing the estimation of potential are grouped into the four main types shown in Table 5.6. Beyond the widely-recognised modal verbs and expressions such as BE [able] *to*, it is important to consider existential expressions of potential, which refer to the potential inherent in a situation, and 'enabling' expressions, which explicitly identify the means by which potential may be realised, the enabling factor.

Table 5.6. Typology of expressions of potential

type	main forms
modal	*can, could*
able/ability	(BE) [able] *to* HAVE [ability] *to*
existential	*it* BE [difficult] *to* [way] *to / of*
enabling	X [enable] Y (*to*)

The extrapolated frequencies for each type based on the concordance analysis of

instances classed as realising [thinker] + [imagine] + *wh* are shown in Figure 5.32. The large majority of instances involve modal verbs – exclusively *can* and *could* – although existential expressions (split into *easy* vs. *difficult*) are also found. However, there are particularly few either 'able/ability' or 'enabling' expressions with this meaning frame. Particularly in the case of 'enabling' expressions, this lack of occurrence seems linked to the typical meanings made with modals of potential and this meaning frame.
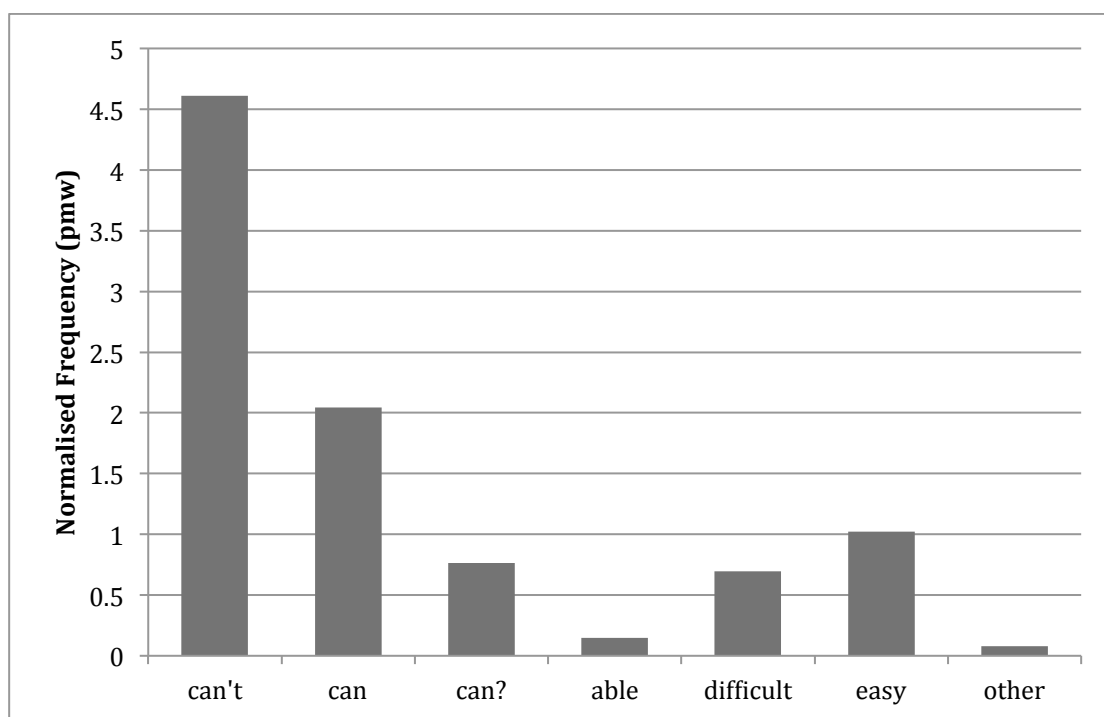
Figure 5.32. Distribution of exponents of potential with [thinker] + [imagine] + *wh*

The examples of [thinker] + [imagine] + *wh* with expressions of potential presented in Figure 5.33 show instances with *can / could (not/n't)* as well as one example of

BE *unable to*. While *imagine wh* occurs with both positive and negative *can/could* (17% and 25% of IMAGINE *wh* instances, respectively), *think wh* is confined to negative instances (lines 6 and 7; 26% of THINK *wh*) and *guess wh* mainly to positive ones (10% of GUESS *wh*; line 8 shows a rare exception). As noted at the beginning of the section, the majority of these instances (around 75%), present the *wh*-clause information as 'special' in some way (see Section 2.6.2). These are what are here termed rhetorical embedded questions since the answer is either implied – with *wh*-exclamative clauses (lines 2, 3, 5 and 7), or construed as unknowable in emphatic instances (line 4). This rhetorical feature is associated with the interactive nature of most of these instances, which can be seen from the fact that around 80% are either first or second person, a figure that rises to over 95% of instances with *can* and interrogatives. Since there is no real need to answer the question in these cases, the ability of the subject to do so is in a sense unimportant. This may suggest why there are very few instances of X BE [able] *to* or other reference to ability with this meaning frame (only 1.5% of the total) and perhaps why such instances (see line 6) are not associated with rhetorical uses of *wh*-clauses. It may also explain why these instances are felt to be more epistemic, in line with Kjellmer's analysis (2003). This reading is particularly apparent in second person instances, not least because we cannot normally know for certain what another person is thinking. This serves to show the general 'affinity between epistemic modality and the notion of ability' noted by Gabrielatos (2010: 134).

This is the only meaning frame apart from [knower] + [know] + *wh* where we

find a significant number of interrogatives, almost invariably *can you imagine/guess wh* (90% of instances). This fits with the interactive nature of *can* in such situations (Hunston 2000; Kjellmer 2003). Such instances are often very close in meaning to *you can imagine / guess wh* since they also involve rhetorical embedded clauses. But also, as shown by line 7, in appearing to invite the interlocutor to imagine *wh* interrogative *can you imagine wh* is quite similar to (*just*) *imagine wh.*

1	It really irritates me! I **can** just	imagine	what it's gonna look like in a few years when it gets
2	And she was furious that Mr Clarke did not break the news to her before holding a Press conference. 'You **can**	guess how	distressed I am,' she said.
3	Brian watched the face of the woman before him. He **could**	imagine how	anxious she must have been , torn between two different kinds of loyalty
4	I want to talk about Alex Household.' 'I **can't**	think what	relevance he has to anything.'
5	I was nine at the time of the wedding and you just **could not**	imagine how	foolish I felt, dressed as a bride in all her finery [...] with hundreds of people looking on.
6	Most physical scientists **are unable to**	imagine what	their subject would be like if there were no elements and no fundamental particles.
7	How do you think the competitors would feel if our findings were proved wrong? **Can** you	imagine what	a scandal that would be?'
8	One colour stands for Jamaica's natural resources and sunshine, one for its agriculture and hope for the future and the last one for the nation's past and present troubles. **Can** you	guess which	colour stands for what?

Figure 5.33. Examples of modals and semi-modals of potential with [thinker] + [imagine] + *wh*

The only other means of referring to potential that co-occurs relatively frequently with this meaning frame is existential expressions, which account for around 18% of all potential expressions and occur around 1.7 times pmw. Around 13.5% of

IMAGINE *wh* and 9% of GUESS *wh* instances co-occur with these expressions. The predominant phraseology (78% of existential instances) is *it* BE [difficult] *to* with the adjectives *(im)possible* (7.5% of instances)*, difficult* (25%)*, hard* (28%) and *easy* (39%). We can note that 'difficult/impossible' instances (around 44%) only involve *imagine wh*, while instances classed with 'easy/possible' also include *guess* and one example of *wonder* (see line 4 in Figure 5.34).

There is a prevalence of rhetorical embedded questions (over 90%) with 'difficult' instances, but this is much less pronounced (17%) with those referring to the possibility or how easy it is to *imagine* or *guess wh.* The italicised items in lines 1-5 of Figure 5.34 indicate typical co-occurrence features in these *wh*-clauses that bias the reader towards a particular answer. However, even where there is no clear surface feature that suggests a 'rhetorical' reading, as in lines 6 and 7, the implication is that the answer is obvious. Lines 7 and 8 also provide examples of two relatively fixed expressions which are associated with GUESS *wh*: (*there are*) *no prizes for guessing wh* (around 0.18 hits pmw) and *it doesn't take much/a lot of imagination to guess wh* (0.04 hits pmw). These are interesting since they do not co-occur with other meaning frames. Line 3 is included as an example of a nominal expression of difficulty which only occurs once in this meaning frame (there is also one instance of *the problem of*).

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1	**It is** now almost **impossible to**	imagine how	doctors *did not* diagnose it *before*.
2	The poverty of the Chinese peasantry was, I mean really for us it's, **it's very difficult to**	imagine **how**	*appalling* conditions were.
3	**The difficulty**, of course, **lies in**	imagining how	*such a* complex behavioural syndrome , which is stable only when complete, *could* arise in the first place.
4	With hindsight, **it is easy to**	wonder why	no one had thought of it *before*.
5	**It was easy to**	imagine what	*relief* the miners *must have* felt at the end of a long day's work in those conditions when they saw the mouth of the tunnel framing the daylight before them.
6	We went through to see a couple of remarkable rock formations, the Trident and the Judge – **no prizes for**	guessing where	they got their names.
7	When the two star-crossed lovers next met, someone, it doesn't take much **imagination** to	guess	who, had made sure that Larry Marsh suspected something was wrong.

Figure 5.34. Examples of existential expressions of potential with [thinker] + [imagine] + *wh*

There are a few other instances of interest; two of these are provided in Figure 5.35. Line 1 is one of only 2 instances of 'enabling' expressions. It is noteworthy because the question is genuine and of interest to the thinker (the *analyst*) which helps to explain why we might be interested in knowing *how* the analyst may be able to imagine the answer. This can also explain why *imagine* in this instance is close in meaning to 'judging' verbs. Line 2 in Figure 5.35 is also of note because it serves to illustrate the fuzzy boundary between instances of potential and those that are classed as expressing uncertainty; again it is possession of knowledge that makes it possible to, or increases the *likelihood* of a successful answer.

1	Knowledge of the addressor in a given communicative event **makes it possible** for the analyst to	imagine what	that particular person is likely to say.
2	What it means is that [...] if you know somebody's sex then you**'ve got a better than chance bet at**	guessing whether	they smoke or not.

Figure 5.35. Examples of other expressions of potential with [thinker] + [imagine] + *wh*

5.3.3 The expression of volition and purpose with [thinker] + [imagine] + *wh*

Only around 4% of instances of this meaning frame are with expressions of volition and purpose, they have a frequency of around 2.9 hits pmw. If we consider the types of expression that do occur (see Figure 5.36), they are restricted mainly to three fairly evenly distributed types, 'trying', 'dreading' and 'tempting'. Neither 'dreading' nor 'tempting' are noted with other meaning frames, which again indicates the uniqueness of this meaning frame in terms of its associations with modal meanings. The 'want' and 'purpose' columns in Figure 5.36 show that these verbs do very occasionally occur with 'wanting' verbs and purpose clauses (only 2 instances and 1 instance, respectively).
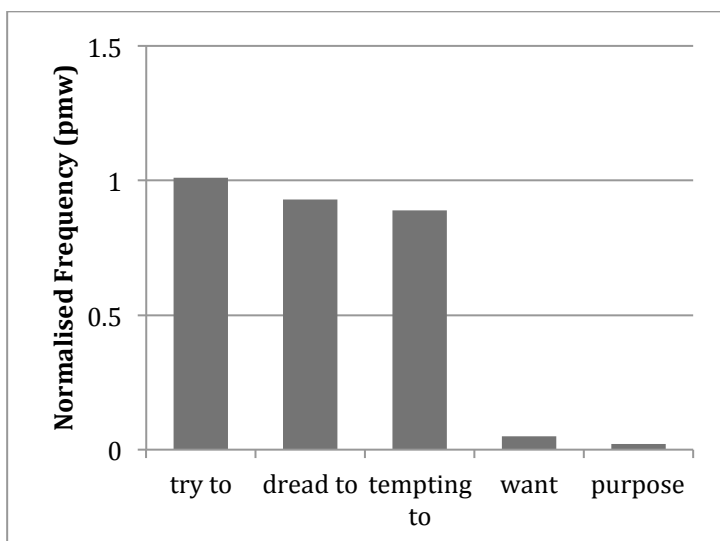
Figure 5.36 Extrapolations of expressions of volition/purpose with [thinker] + [imagine] + *wh*

Figure 5.37 provides examples of instances where the 'thinker' is construed as *trying* or *struggling to* think of an answer to a question; only instances of IMAGINE (9% of its **V wh** instances) and GUESS (3%) were found with 'trying' expressions. There are no occurrences of ATTEMPT with 'thinking' verbs. Even more than with other meaning frames, TRY *to* (and one instance of TRY *and*) predominates, with over 90% of instances; there are also instances of STRUGGLE *to*, MAKE *an effort to* and PLAY *at* (see lines 1, 4 and 9). The avoidance of commitment as to whether the guess is or was correct can be seen in several of the examples – the speaker or writer in lines 4, 7 and 8 either indicates the lack of success (line 4) or remains uncommitted (lines 7 and 8).

The high numbers of 'rhetorical' *wh*-clauses found in other instances of the meaning frame are far less in evidence here (only around 10% of instances), and

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only involve IMAGINE *wh*. Line 1 provides a fairly clear example in that where the reader or listener is encouraged to share the bafflement experienced by the *thinker*, as shown by the emphatic *such* in the *wh*-clause. There are two main patterns of use associated with different meanings for 'trying' with 'thinking' verbs: the first, majority usage (70%), involves reference to past, narrative instances of trying to imagine or guess the answer to a question. This is seen in lines 1-6. The second, present tense use is for reference to some kind of guessing game or exercise (see lines 7-9; around 28% of instances).

1	This made me lose track of his subsequent drift as I **struggled to**	imagine how	chess-playing came to have **such** a pejorative connotation for him.
2	There was real feeling in this judgement, McLeish decided, and **tried to**	imagine what	kind of man had decided to relegate Catherine Crane to fourth place in his scheme of things.
3	I just **tried to**	imagine what	it would have felt like, but couldn't draw on any past experiences.'
4	Think where you'd be if you'd chosen him.' Susan **made an effort to**	imagine what	it would be like to live a settled life with a partner she saw every day . She could not imagine it .
5	He continued on across the road and down by the side of the church , heading south towards Pimlico, **trying to**	imagine how	it had been on that September day all those years ago.
6	I ate slowly and watched the dance floor. I **tried to**	guess which	of the women were the Russian wives of men stationed here and which were Latvian girls.
7	The eagle swoops towards the goats with outstretched arms . The goats **try to**	guess who	the eagle wants to attack and hide her in a circle . If they are right , the eagle flies away .
8	One Brownie picks out a card then gives the other Brownies a clue about the country . The other Brownies **try to**	guess where	she is. If they haven't guessed after three clues then she chooses another card.
9	Nevertheless, I find it useful to **play at**	imagining what	kind of school system could provide a congenial conduit for my educational ideals.

Figure 5.37. Examples of 'trying' expressions with [thinker] + [imagine] + *wh*

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The other type of expressions interpreted as carrying volitional meaning found with 'thinking' verbs, 'dreading' and 'tempting', are largely confined to this meaning frame. Examples are provided in Figure 5.38. For 'dreading', the verbs DREAD and HATE make up around 60% of instances; other forms with similar meanings are: PREFER *not to* and *not* WANT *to,* and *can't bear to.* The only 'thinking' verbs that occur are THINK, IMAGINE and CONSIDER. As the examples suggest, these instances invariably either report the subject's 'internal monologue' (20% of the time) or are first person.

1	She assured Charles she had been subtle in her questioning, but he **dreaded to**	think what	she meant by subtlety.
2	I brought only the most attractive brochures,' Adam said. 'I **hate to**	think what	the others are like,' Annabel said.
3	I **can't bear to**	think what	that poor woman must be suffering
4	Mr Kennedy says: 'If that 's how they treat a witness , I **dread to**	imagine how	they treat a suspect.'
5	She **preferred not to**	consider what	might occur should he find her again during one of these fits.
6	'They tell me he's a little more relaxed on this one than his earlier ones,' says Kyle MacLachlan […] 'I **don't really want to**	imagine what	they were like but I know it's not an intense thing for him to do like Platoon was .
7	We have Jesus arriving having won something . **It's interesting to**	wonder what	he's won. Having read what you've just done.
8	So wide are the analyses and the prescriptions that one **is tempted to**	wonder whether	the concept of pluralist stagnation might itself be applied to the political analysis of Britain's ills.

Figure 5.38. 'Dread to' and 'tempted to' expressions with [thinker] + [imagine] + *wh*

With instances of *tempted to / interesting to* (see lines 7 and 8) only *wonder, consider* and *imagine* were found, and only *wonder* more than once; the (concessive) expression *fun as it might be to* was also noted. This is quite a minor

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meaning for 'thinking' verbs, but is interesting in that shares with 'dreading' instances the expression of speaker attitude towards the 'thinking' without the 'forward projecting' meaning typically associated with expressions of volition (Givon 2001). In saying *I dread to think wh* or *it is tempting to consider wh*, one is actually carrying out the 'thinking', not aiming or intending to do it in the future[1]. It is also interesting to note that the *wh*-clauses in these instances are biased towards a particular interpretation, even if it is implicit in most cases.

This section has shown again how this meaning frame has quite different phraseologies from 'judging' and 'finding out' instances, only exploiting a few of the resources of volition that are available.

5.3.4 The expression of uncertainty with [thinker] + [imagine] + *wh*

Figure 5.28 showed that exponents of uncertainty do not occur very frequently with this meaning frame (around 4.5 hits pmw, or 6% of all instances). This is partly due to the influence of WONDER, the most frequently occurring **V wh** verb included in this meaning frame; as a question-oriented verb WONDER itself express uncertainty (Perkins 1983). Moreover, of the range of possible exponents of uncertainty listed in Table 5.7, few were found in the concordance lines of samples of 'thinking'

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[1] The meaning here is close to the type of evaluative meaning of expressions such as *I'm glad / horrified that...* which tend to be excluded from the remit of modality (e.g. Lyons 1977, Perkins 1983, Gabrielatos 2010) as they do not assert the proposition but which Nuyts (2005) explicitly includes.

verbs.

Table 5.7. Typology of expressions of uncertainty

Type	Main forms
modals, semi-modals	*will, would, may, might, must, should*
adverbs	*probably, perhaps*
projection	[think] (that)
conditional	*if, unless*
***yes-no* question**	*Have you …?*

Figure 5.39 shows the distributions of expressions of uncertainty with this meaning frame. We can note the predominance of modal verbs and semi-modals expressing uncertainty; the only other means of expressing uncertainty that occurs more than 0.5 times pmw is modal adverbs such as *perhaps*.
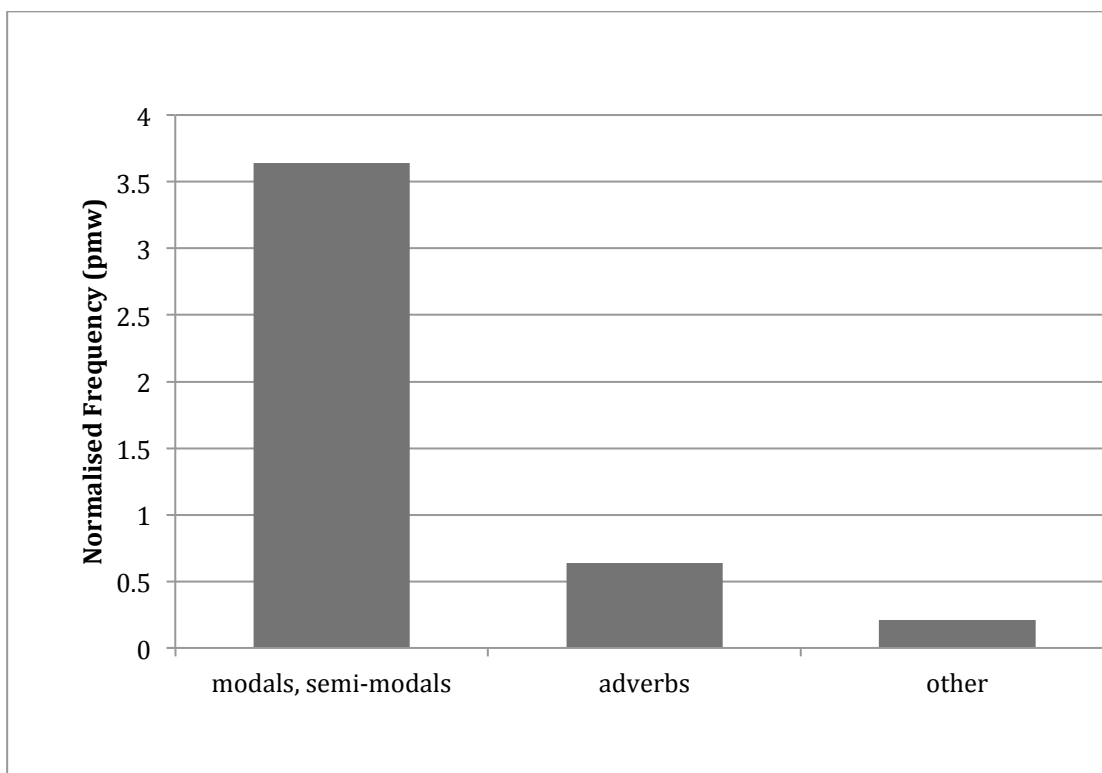
Figure 5.39. Distributions of exponents of uncertainty with [thinker] + [imagine] + *wh*

Instances of modals of uncertainty with [thinker] + [imagine] + *wh* are presented in Figure 5.40. Almost all (33 out of 35) instances with modals[1] either involve GUESS (21) or WONDER (12), although the usages of the two verbs are quite different. It should be noted that, as WONDER is more than 15 times as frequent as GUESS, has a much greater influence on the frequencies shown in Figure 5.39.

With GUESS, 40% of its 'uncertainty' instances form a quite consistent phraseology *you'll never guess wh* (line 1), a variation of which is seen in line 2. This is clearly related to imperative *guess wh* seen in Section 5.3.1 and so

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[1] And 46 out of the 51 instances classed as 'uncertain'

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functions as a 'pre-announcement' (Schegloff 1988), preparing the interlocutor for some interesting information; all these instances are second person. With positive instances of GUESS, exemplified by lines 3 and 4, the suggestion is that the subject referent had or has the evidence with which to 'guess' (*must/will/may/should have guessed wh*); these instances occur either with *wh*-exclamative clauses as line 2, or in co-texts where the answer is either provided immediately or is implicit. It is interesting to note that in around 25% of these instances (see line 4), the implication is that the entity responsible for the modal judgement (in this case *she*) does not want the guessing to be successful, as indicated by *terrified* (*that*).

With WONDER and QUESTION the combination with these modals (*will* is found once) is in instances that imply not just different levels of uncertainty over whether the 'wondering' will take place, but also that the subject-referent would be justified in holding a suspicion or doubt. The *wh*-clauses tend to be biased towards a particular answer – with the exception of line 7, where only two options are available anyway – and therefore not really open questions (as indicated by italicised items in lines 5, 6 and 8). In these environments, that is, in co-occurrence with WONDER / QUESTION and 'special' *wh*-clauses (either 'biased' or *wh*-exclamatives), we can note that an 'obligation' reading of *must* and HAVE *to* makes less sense than a 'logical conclusion' meaning; the speaker is not demanding that the reader wonders or questions, but is instead arguing that based on what is known, (e.g. knowledge of Barth's background in line 6), some kind of doubt or suspicion is inevitable. This is a further example of how the meanings of modal

expressions change in more rhetorical contexts.

1	Later, I found out what it was all about. You**'ll never**	guess what	's happened? Oliver has gone and lost his job .
2	Oh, you**'re never gonna**	guess what	's on today? Original cooking, [unclear] today .
3	You **must have**	guessed how	*precarious* their balance sheet was?'
4	She stood quivering in his grasp, *terrified* he **might** somehow	guess what	she had been thinking.
5	[...] Wright 's short fuse is a serious business and if Graham is to lose a top player through suspension, on top of all the headlines on his ill-discipline, the Arsenal manager **may** soon	wonder if	he is *worth* the trouble .
6	What is God's will is, for Barth, to be read out of the scriptures. (Though one **must**	wonder how	*far* Barth was influenced in his interpretation of scripture by the conservative Swiss background from which he came.)
7	Internal appeals If you appeal against your dismissal, and your appeal is rejected, you **may**	wonder whether	your job legally came to an end at the time of your original dismissal or when the appeal was eventually turned down.
8	Unless you have lots of tanks to check or you keep and breed Discus, Rams or maybe Uaru, you **have to**	question if	all this fuss is *any* more convenient than a tube and tablet kit.

Figure 5.40. Uncertainty modals and semi-modals with [thinker] + [imagine] + *wh*

While other means of expressing uncertainty are rare with this meaning frame, they show some interesting features. Line 1 of Figure 5.41 shows similarities with line 4 of Figure 5.40, indicating how other means of expressing uncertainty (*in case*) are also combined with reluctance on the part of one entity for the subject referent to 'guess'; this meaning is seen in less than 20% of instances. Other instances of uncertainty with GUESS are used to indicate levels of certainty; only mental verbs followed by *that*-clauses (line 2) and conditionals occur more than once. Lines 3 and 4 show the use of adverbs (0.6 hits pmw) to show different levels of certainty;

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no doubt is a good example of Halliday's (1994: 89) point that 'you only say you are

certain when you are not'. Adverbs only occur with WONDER, QUESTION and THINK.

1	She buried her face against him , afraid to say any more **in case** he	guessed how	she felt , and he gathered her close , reaching out to switch off the lamps.
2	'You, **I believe**, have	guessed where	I'm from.' 'Yes,' says Agnes.
3	**No doubt** you're	wondering who	our new reviewer is. Well, we can now officially welcome to the team the one and (hopefully) only, James Price!
4	You are dissatisfied with Sung. **Perhaps** you're even	thinking what	this might lead to.

Figure 5.41. Other exponents of 'uncertainty' with [thinker] + [imagine] + *wh*

5.3.5 Indicative [thinker] + [imagine] + *wh*

The relatively high proportion of (positive) indicative instances (61% of all

instances) for this meaning frame is mainly due to the verb WONDER. As noted in

Section 2.6, WONDER is a question-oriented verb, expressing uncertainty (Perkins

1983; Quirk et al. 1985); there is therefore an argument that it is inherently modal

(Perkins 1983). In any case, it is a highly unusual **V wh** verb, not least because

more than 72% of the time it has *wh*-clause complementation; only two other verbs

are above 40%, FIGURE *out* (64.5%) and FIND *out* (41%). Figure 5.42 shows some

examples of indicative 'thinking' verb instances.

1	I can't help but think there are many marginally employed musicians around Ireland today who weep or harrumph glumly into their pints when they	think what	might have happened if they'd listened to Nicky.
2	They went on a honeymoon to India where Gould sulked profusely and Rebuck kept	wondering if	she had done the right thing.
3	She	questioned whether	what they lacked was not ruthless ambition.
4	I must say, she's pretty cool. Never batted an eyelid when we were all	wondering where	Gebrec had got to ... although she did react rather oddly when Dieter showed up
5	All through the short plane journey she'd been	imagining what	it would be like to meet Rune again socially .
6	I	thought how	the baby would look if it were born now , just a red dead morsel to be wrapped up quickly and thrown away
7	Blanche 's lips set into a pout of annoyance . Dexter	guessed why	: Lancaster had been ruffled by her questions and the interruption would allow him to regain his composure.

Figure 5.42. Examples of indicative [thinker] + [imagine] + *wh*

5.4 Conclusion

This chapter has looked at two meaning frames, [decider] + [judge] + *wh* and [thinker] + [imagine] + *wh*, which have quite different phraseological behaviour although they are both related to thinking. [decider] + [judge] + *wh* is quite similar to [knowledge-seeker] + [find out] + *wh* in terms of the modal meanings that it is associated with and their realisations. However, [thinker] + [imagine] + *wh* is not as associated with modal meaning. This difference seems to be associated with two main factors: the question orientation of WONDER (and QUESTION) means that modal meanings are not 'needed' so much; also, the generally rhetorical meanings of the *wh*-clauses means that, in contrast to [decider] + [judge] + wh, what is at stake is

not really a question requiring an answer. This has further effects on the modal meanings that are associated with [thinker] + [imagine] + *wh* and with their realisations, creating similarities that seem to cross modal boundaries as normally drawn, for example, the similarity between 'deontic' imperative *guess wh* and 'epistemic' *you'll never guess wh*. Similar merging of modal meanings will be seen for the related meaning frame [commentator] + [question] + *wh* in the next chapter.

CHAPTER 6 – 'COMMUNICATING' FRAMES

6.1 Introduction

The meaning frames discussed in this chapter relate to 'communicating'. As with 'thinking' in Chapter 5, they are divided into sub-groups according to the meanings they express, taking into account typical participants, *wh*-clause meaning and the meaning of the verb in the sequence. These sequences are included under the term 'communicating' because they all broadly relate to the exchange of information, whether the provision of information ([source] + [describe] + *wh* – Section 6.2), the posing of a question ([inquirer] + [ask] + *wh* – Section 6.3.1) or the expression of disbelief or suspicion ([commentator] + [question] + *wh* – Section 6.3.2).

In the case of the meaning frames in this chapter, we can initially note that [source] + [describe] + *wh* shows an association with most of the types of modal meaning. The other two meaning frames, however, are much less associated with modal meanings. For this reason they are less interesting from the point of view of this study, except in that they exhibit question-orientation and the effect this has on the modal meanings involved.

6.2 The meaning frame [source] + [describe] + *wh*

The first and largest meaning frame relating to communication is [source] + [describe] + *wh*. Verbs in this meaning group are listed in the final row of Table 6.1, which also shows that all previous studies have a group relating to communication, although under different names and with varying extensions. There is also broad agreement regarding the verbs concerned. However, this broad agreement masks certain issues that become more prominent when one considers the different senses of individual verbs and common senses across verbs and how these are reflected by other features in the concordance lines such as *wh*-clause types and types of subject. The first of these is that all of the verbs listed in the bottom row of Table 6.1 except for DESCRIBE, DISCUSS, SAY and SPECIFY are interpreted here as polysemous; they have instances in other meaning frames. Secondly, CONSIDER and PREDICT are not usually included with this type of meaning.

Table 6.1. Groups of 'communicating' **V wh** verbs in previous studies

study	meaning groups	example verbs
Karttunen (1977)	verbs of communication	*tell, show, indicate*
Francis et al. (1996) V wh pattern	ASK	*describe, discuss, explain, indicate, reveal, say, specify*
Francis et al. (1996) V wh-to-inf pattern	DESCRIBE	*demonstrate, describe, explain, indicate, reveal, say, show, specify*
Biber et al. (1999)	Speech act verbs Other communication verbs	*discuss, explain, say* *show, describe, indicate, reveal*
Trotta (2000)	Communication	*demonstrate, describe, explain, say*
Huddleston & Pullum (2002)	Telling	*tell, show*
current study	[source] + [describe] + wh	***consider**, demonstrate, describe, discuss, explain, indicate, **predict**, reveal, say, show, specify, tell*

The formation of this meaning frame has already been discussed in some detail with reference to the verb EXPLAIN in Section 3.4.3; a brief review will follow to inclulde examples of other verbs. Figure 6.1 shows examples of 'describing' verbs included in this meaning frame; they indicate some of the important features of [source] + [describe] + *wh*. As noted in Section 3.4.3, the subjects (bolded) in combination with 'describing' verbs refer either to people or texts acting as 'sources' of information that others may want to know (the *wh*-clause); this information may relate to instructions in the case of 'directive' *wh*-clauses such as line 3. It may also involve reference is to physical demonstration (line 4), which is viewed as involving the 'symbolic exchange of meaning' (Halliday 1994: 140).

However, as discussed in Section 3.4.3, with certain verbs, such as EXPLAIN

(also DEMONSTRATE, SHOW, REVEAL, INDICATE and TELL; see Chapter 8), a focus on subject types suggested more than one sense. In instances such as line 7, the subject-referent of EXPLAIN – *managerial and financial gains* –represents the (inanimate) explanatory factor or evidence rather than the (animate) 'explainer'. The existence of such instances led to the formation of a separate meaning group, [situation] + [explain] + *wh,* which will be described in Chapter 8. A similar distinction was made for a number of instances of DEMONSTRATE, SHOW, REVEAL and INDICATE; these are also dealt with in Chapter 8. The identification of different types of subject was then found to be associated with different types of *wh*-clause; the greater association of *why*-clauses with inanimate subject referents has already been noted in Section 3.4.3; but we can also add the greater association of directive *wh*-clauses with [source] + [describe] + *wh.* This type of *wh*-clause is almost completely absent from instances with inanimate subjects.

The final two lines of Figure 6.1 show examples of CONSIDER and PREDICT that were included in this meaning group. With CONSIDER around 24% of its **V wh** sample were included in this meaning frame; they are particularly associated with describing or discussing information in texts. Instances of PREDICT (10% of the sample) are included in this meaning group where it is clear that the prediction is communicated, as in line 10; we can hardly know what (or that) futurologists are predicting here without their communicating the predictions.

1	**He**	describes how	he is not invited to a ball at Harrington but waits in the terrace garden to see 'Maud' afterwards
2	**This book** has	described how	the marvellously rich and varied wildlife of the East inherited its kingdom
3	**Appendix V**, p 298, lists the main 'rare foods' and	describes how	to prepare them.
4	**Well-known artist and tutor David Bellamy** will	demonstrate how	to enhance landscapes by the inclusion of wildlife.
5	**The farmer**	explained how	he had met the tiger and how , to save his oxen , he had promised the cow in exchange.
6	**The 'User 's Guide** to LIFESPAN'	explains how	to perform the tasks supported by LIFESPAN
7	T**hese managerial and financial gains** could	explain why	mergers make sense even for companies producing completely distinct products.
8	CFC substitutes **: a technology impact report** (TO49)	considers how	the refrigeration, foam blowing and circuit board industries can substitute for CFCs at three distinct levels
9	**Futurologists** however continue as confidently as ever to	predict what	we shall soon be doing

Figure 6.1. Example instances of the meaning frame [source] + [describe] + *wh*

In summary, then instances classed as [source] + [describe] + *wh* involve a person or a text communicating (including demonstrating) information. Figure 6.2 shows the distribution of modal and non-modal meanings for this meaning frame based on extrapolations from the sample. The largest number of instances are (positive) indicative – this follows the pattern already seen for the example of [source] + EXPLAIN + *wh* in Chapter 3. However, it can also be seen that there are significant numbers of instances involving either obligation, volition/purpose or potential.
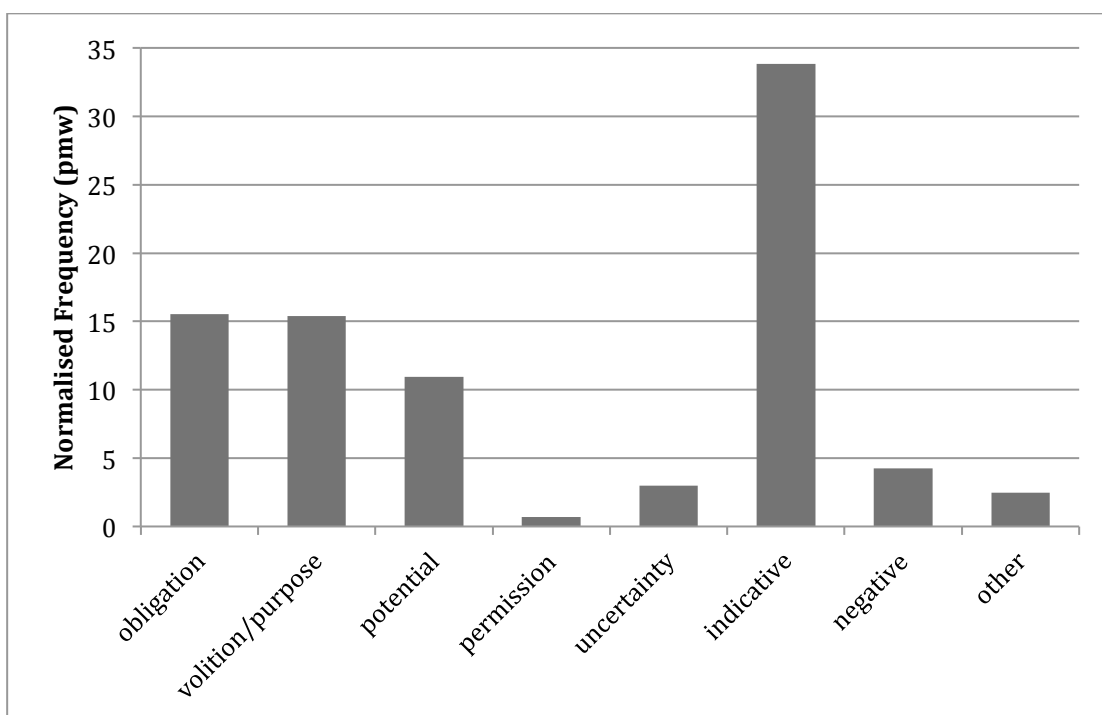
Figure 6.2. Distribution of modal and non-modal meanings for [source] + [describe] + *wh*

6.2.1 The expression of obligation with [source] + [describe] *+ wh*

This section discusses the ways of expressing and referring to obligation associated with this meaning frame. The typology of obligation expressions introduced in Section 2.4.1 is shown in Table 6.2; it attempts to account for the meaning potentials of the different types. Dividing up obligation expressions in this way and investigating their associations with particular verbs or groups of verbs reveals certain phraseologies as will be shown in this section.

Table 6.2. Typology of expressions of obligation

Type	Main forms
imperatives, imperative-likes	imperative *you may want to*
modals	*must, should*
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*
existential	*it* BE [important] *to* *there* BE *a need to*
X ask Y to	X [ask] Y *to*
X BE asked to	X BE [asked] *to*
X's task to	*it* BE X's [task] *to*

If we consider the extrapolated frequencies of each type of obligation expression (see Figure 6.3), we can see that they are all relatively well represented. It is noteworthy that modal verbs and semi-modals are no more frequent than the other expression types. In fact, imperatives are more frequent than other exponents of obligation, but 'imperative-like' expressions are also more associated with 'describing' verbs than other meaning frames.
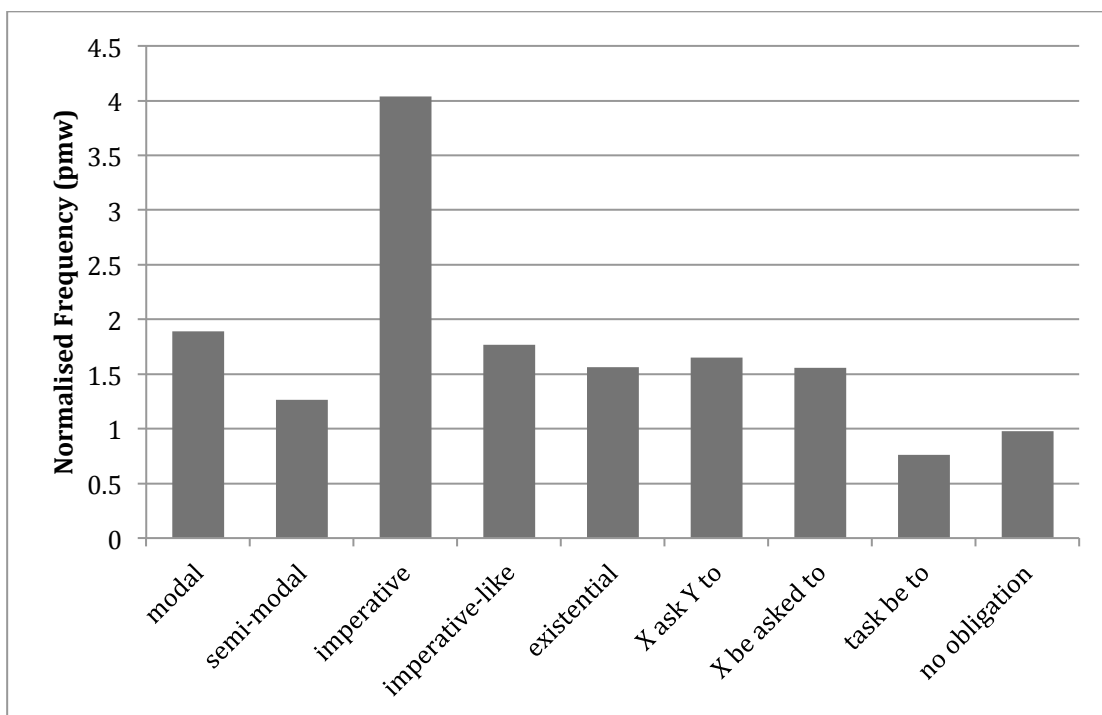
Figure 6.3. Extrapolated distributions (pmw) of obligation expression types with [source] + [describe] + *wh*

Figure 6.4 presents examples of modal verbs and semi-modals of obligation with this meaning frame. They are presented together because they have in common that the obligation implicitly comes from the speaker and the obliged party is explicitly the subject-referent. For this reason, the meanings expressed tend to be similar, the essential difference lying in the fact that NEED *to* and HAVE *to* inflect and co-occur with other modal and semi-modal forms (see lines 3 and 9). Almost the full range of [source] + [describe] + *wh* verbs are represented in the examples; DISCUSS (7% of **V wh** instances) and SPECIFY (7.5%) are the verbs most associated with modals and semi-modals.

First person instances with modals and semi-modals account for around one

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third of extrapolated instances. All but two of these instances involve *we*. Lines 1 and 2 are examples of the 'textual' use where an expression of obligation serves as a rhetorical device for argument building (Van linden & Verstraete 2011; Van linden 2012). The continuation in line 1 indicates how in such instances the question raised by the *wh*-clause is then answered in the subsequent text. This use is particularly associated with the verb CONSIDER and is also seen with *let's/let me* below. The other main function of first person instances is that of 'self-exhortation' (Coates 1983) seen in line 3 where the speaker urges a course of action that is a reaction to the situation as presented in the previous sentence.

Second person instances account for around 21% of the total for modals and semi-modals. As noted for 'finding out' and 'judging' verbs, almost invariably second person is associated with markers indicating that either the instance is part of a list of instructions/advice involving other markers of obligation such as those italicised in line 4. Lines 5 and 6 show how, where reference is made to official documents (licence, application), the distinction between second and third person can become blurred. Third person subjects account for around 45% of modal and semi-modal instances; where people are indicated as the subject referents, they are typically those in a position of authority (*parents, committees, politicians, teachers*) as shown in line 7; a significant proportion of instances refer to official documents (lines 8 and 9), which, combined with instances referring to those in authority comprise around 75% of the instances. Line 9 is included here to show that instances with the modal verb *will* can express a form of obligation. The final

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line provides an example expressing weaker obligation only rarely found (0.1 hits pmw); where this meaning of *can / could* is found, it occurs in lists of suggestions (see previous sentence, which also includes *could*).

1	At this point I **must**	consider what	is meant by 'tariff' in this context. There has been a tariff among the judges since ....
2	So against the narrow focus of the impact of enterprise unions within their own firms we **need to**	consider how	far their achievements are filtered down to small firms where formal labour representation is minimal .
3	Will think me callow, inexperienced. We **need to**	demonstrate how	wrong they are .
4	You **should**	describe where	he potential risk lies and how it could develop . *You do not have to* think of something every time that the film stops, but *please try to describe* [...]
5	On that licence ... you **have to**	indicate how	many stalls , how many people you expect to attract , the times you're gonna be open and you have to give a month's notice.
6	Persons making the application should complete their name and address and **should**	indicate what	they are applying for.
7	It is not sufficient to tell the conference that there will be no return to mass picketing. Most important, he **will have to**	explain how	far sympathy action should be allowed and precisely what would constitute a lawful trade dispute.
8	Except with the consent of the Panel , the offer document **must**	describe how	the offer is to be financed , the source of that finance ...
9	Your outline (see above, Chapter 1, pp. 22-4 and Chapter 3, pp. 59 -61) **will**	indicate what	needs to go into each part of your essay
10	They could be asked to guess which was the earliest, and to give reasons for their choice. They **could**	discuss which	would get cold most quickly, which would stay hottest longest and why .

Figure 6.4. Modals and semi-modals of obligation with [source] + [describe] + *wh*

As already noted, imperatives and the imperative-like requests are comparatively

frequent with this meaning frame; imperatives occur with a frequency of around 3.7 hits pmw, *let's* around 0.3 pmw and imperative-like requests around 1.8 hits pmw (in total, around 37% of obligation instances).

Some examples are provided in Figure 6.5. In terms of imperatives, we can note three main uses. The first use (around 31% of imperatives) is in giving advice or instructions (line 2) which occur with other features that mark them as such, such as being parts of longer lists of imperative forms and/or in combination with *if*-conditional clauses – both features are seen here. The second, and most frequent in this meaning frame (53% of imperatives) is the textbook or examination question (line 3) asking the student to *describe*, *discuss*, *explain*, *predict* or *say* the answer to a question. Again, this use is accompanied by certain features; in the example the situation is presented followed by the question, but elsewhere the question is either explicitly labelled as such or given a number or letter. The third use (15%), mainly associated with imperative *indicate wh* in this sample, is a request for information, often preceded by *please*, as in line 1. This final use of imperatives is close in meaning to the indirect request types in lines 6-8 – we can note the addition of *please* in lines 1 and 6; these almost all involve interrogative clauses with *can, will* and *would (you mind)* fairly evenly split between, second person forms of address and third person indirect requests (line 8) (Levinson 1988). There are only a few instances of *let's*; they all coincide with what Van linden's (2012) 'text-building' function and are particularly associated with CONSIDER.

1	There will be an opportunity to attend rehearsals, interview finalists and take photographs. Please	indicate if	you wish to be present.
2	Always enquire whether or not it is convenient to proceed. If an incoming call is not convenient,	explain why	and take the name and number of the caller and offer to phone back.
3	Variable and fixed costs are traditionally assumed to be linear.	Describe why	this assumption is unrealistic .
4	Often, this is more complex than it first appears. For example, **let us**	consider how	we would set about studying levels of violence in residential establishments for children .
5	that then is the minor and the major claim being made erm **let's now**	discuss whether	there 's any evidence for it erm or any evidence against it .
6	I have heard of Land Rover owners converting to negative earth alternator system. **Could you please**	describe what	's involved in the change over .
7	Oh. So **would you mind**	describing how	you got it up there again cos I thought it was quite a good story.
8	Mr. Win Griffiths **Will the Minister**	explain why	… the Government are being dragged to the European Court

Figure 6.5. Imperatives and imperative-likes with [source] + [describe] + *wh*

With existential expressions of obligation, three main types have been noted with previous meaning frames. The first type, which predominates (nearly 80% of the total; 1.2 hits pmw) is the phraseology *it* BE [important] *to*. Some examples of these expressions are provided in Figure 6.6. It has been noted in earlier chapters that the identification of introductory *it* expressions of obligation is most obvious with the most common exponents, *it* BE *necessary/important to*, which account for around 55% of realisations of this expression. However, a range of other items can have an obligation reading, including items indicating lower obligation such as *useful, helpful* and *better.* These existential constructions in context can implicate either an implicit second person obliged party or the writer/speaker. There are few cases of

the former, with line 4 being one example; here a course of action is being suggested to a listener. Almost all other instances of introductory *it* expressions involve the 'text-building' use (Van linden 2012), mostly with the verb CONSIDER; lines 1, 3 and 5-8 are examples. It is on the basis of their similar textual function to examples such as 1 (and italicised items which are associated with obligation expressions) that examples like 5-8 are included under obligation, although there is some overlap with expressions of intention here, particularly in line 5 (*we shall look later* is already a statement of intent). The final example not discussed (line 2) is exceptional in several ways: it is one of a very few cases of *it* BECOME *important to* in the entire sample; it is past tense and reported obligation; the obliged party is identified (*for me*) and is first person; the adjective *important* is modified by *very*.

1	*In order to* understand Leapor 's struggle with her employers, **it is necessary to**	consider how	specific tasks made an impression on her poetry . According to the Purefoys' description of a kitchen maid 's work...
2	He looked out of the window. **It** suddenly **became** very **important for me to**	explain why	my war was not over .
3	As well as showing the average or individual costs of community care under the Home Support Project **it would** clearly also **be useful to**	show whether	the project was or was not cost-effective overall
4	In this instance, some people would smack the child, but **it is better to**	explain where	the danger lies and remove the child from that situation.'
5	We shall look later in some detail at how independence changed the media of Tanzania and Zambia , but *first* **it will be helpful to**	consider what	facilities existed throughout Africa in that period of transition .
6	*Third*, **it is instructive to**	consider how	far the final form of local government reorganisation in England was affected by party politics.
7	*Before* examining the two main means of constructing classification schedules, **it is as well to**	consider what	the objectives of the designer of a classification scheme should be.
8	**It remains to**	consider whether	the routine collection of data to permit component forecasts of HE could be justified.

Figure 6.6. Existential expressions of obligation with [source] + [describe] + *wh*

Both the phraseologies X [ask] Y *to* (1.65 hits pmw) and X BE [asked] *to* (1.56 hits pmw) occur with 'describing' verbs. Instances involve most of the verbs in this meaning frame. Examples of both types are provided in Figure 6.7.

With instances of X [ask] Y *to* (lines 1-4) we can note similar patterns of usage as noted for 'finding out' and 'judging' instances. The verb ASK is most frequent, accounting for around 44% of instances, but a range of other verbs is seen once only unless otherwise indicated: *would like*, TELL, GET, FORCE (3

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instances), CHALLENGE (2), URGE, REQUIRE, EXPECT, ENCOURAGE and INVITE (2). This list indicates how a range of strengths of obligation can be indicated, from stronger URGE and REQUIRE to weaker ENCOURAGE and INVITE. While around 14% of instances involve the direct expression of obligation as in line 1, most examples report the imposition of obligation by authorities (line 4) or report requests (line 3), generally in the past. In this respect, examples such as line 2 are interesting in that knowing that the 'agency' (the previous sentence makes clear that it is the *US Environmental Protection Agency*) has this requirement is an explicit alternative to *studies must show...* where the use of the modal *must* means that the obliging party is not necessarily named.

With X BE [asked] *to* (lines 5-8), again ASK is the most frequent verb (around 36% of instances) and a range of verbs is seen; those not mentioned above include INSTRUCT and OBLIGE. Present tense instances with *required* such as line 5 (around 10% of instances) have a 'deontic statement' interpretation, since they suggest a general requirement, which is why BE *required/obliged to* are sometimes listed as members of the 'semi-modals'. In examples like line 6, *were asked to* is very close in meaning to *had to*. Nevertheless, most instances offer a wider range of meanings than is available with *had/needed to*, as indicated by lines 7 and 8, where first of all the use of passive forms means that the source (*by the Conservatives*) can be identified and secondly different levels of obligation (e.g. *invited*) can be indicated.

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1	Dr. Reid If, as the Minister says , we recouped so much money on the Gulf war, **may I ask him to**	explain why	the Ministry of Defence is being so mean and tight-fisted towards some of those who were prepared to make the ultimate sacrifice during that war?
2	The agency **requires** studies **to**	show how	much spray residue is left on crops after harvesting and if the pesticide breaks down safely in water.
3	Professor Norman Mackenzie is Chairman of Education. I **asked** him **to**	explain how	the Area relates to the rest of the University.
4	As part of the process , the BBC also **commissioned** a confidential report **to**	show how	much it could make from broadcasting commercials to supplement the licence fee.
5	An application for a property adjustment order **is required to** identify the land ,	specify whether	the property concerned is registered or unregistered (and , if the former , its title number)... (Family Proceedings Rules 1991 (SI No 1247) r2.59(2)) .
6	Respondents **were asked to**	describe how	training was funded in their authority and how much was budgeted or spent in 1983/4
7	In the general election ... the Liberals **were challenged** by the Conservatives **to**	explain where	the money would come from.
8	The policy statement , Paying for a Beautiful Countryside , suggests farmers **should be invited to**	say what	they can produce for the good of the countryside , rather than being compensated for not carrying out certain types of farming.

Figure 6.7. Examples of X [ask] Y *to* and X BE [asked] *to* with [source] + [describe] + *wh*

The final type of obligation expression identified with instances of 'describing' verbs is where there is reference to a job or responsibility; it is represented as X's [task] BE *to*. This is a lower frequency type of expression with this meaning frame at around 0.8 hits pmw. While the noun *task* occurs in nearly half of the instances, *burden, onus, problem* and *job* are all found once. With this expression, the focus is on the responsibility that has been given to the obliged party, which makes instances more explicit than instances with modal verbs. It is important to note that most of these instances (85%) report a present 'task', as in the examples in Figure

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6.8 which can explain why a modal paraphrase is possible (Finnis *must* or *has to* in line 1). Line 3 is the only example of the related X ʜᴀᴠᴇ *responsibility to*.

1	If not, as with 'honesty', **the onus remains on** Finnis **to**	explain what	, consistent with his methodology, distinguishes genuine or legitimate determinations from false or illegitimate determinations.
2	**Our job is to**	say what	higher education costs . It is not for us to make political decisions .
3	Every social worker **has a responsibility to** stand up for their own profession, [...] and to	explain why	things are done in certain ways .

Figure 6.8. Examples of X's [task] ʙᴇ *to* expressions with [source] + [describe] + *wh*

Expressions of lack of obligation matching those of obligation are infrequently attested in general with instances of **V wh.** This meaning frame is no different since they only account for around 6% of all obligation instances. Some examples are provided in Figure 6.9; the majority (66%) are, like lines 1 and 2, instances of *do not have to / ain't gotta*.

1	No Jean , you **ain't gotta**	say who	you are nothing like that
2	We **do not have to**	specify what	it is we want to any analyst who in turn specifies it to a programmer who then writes a program .
3	For instance , on a question involving the law of wagers , **there is** generally **no need to**	discuss what	is a wager .
4	Technically, the Act **does not oblige** the person imposing the conditions **to**	specify which	of the alternative grounds he relies upon for his authority to do so , although where the event is to be held in the future , the directions given by the chief of police must be in writing .
5	**It's not up to** us **to**	say what	will happen .

Figure 6.9. Lack of obligation examples with [source] + [describe] + *wh*

This section has shown that the meaning frame [source] + [describe] + *wh*, like the other agentive frames [knowledge-seeker] + [find out] + *wh* and [decider] + [judge] + *wh*, occurs with the full range of obligation expressions, indicating how these expressions complement and overlap with each other. With this meaning frame, there is an influence of the typical meanings of these verbs on the frequencies of different types of expression: their use in examination questions, for example, increases the frequency of imperatives; their use in requests for information accounts for a relatively high frequency of, on the one hand imperative-like expressions (e.g. *could you explain wh*) and, on the other, reports of these requests (*X was asked to* ...).

6.2.2 The estimation of potential with [source] + [describe] + *wh*

The four main types of expression of potential whose frequencies and associations are the subject of this section are shown in Table 6.3. Apart from the well-known modal verbs and 'semi-modal' BE *able to*, these extend to existential expressions, where the potential is presented as being inherent in the situation, and 'enabling' expressions, which identify the enabling factor. These latter two types of expressions can be seen as complementing the meanings of the more familiar forms by allowing reference to degrees of difficulty and possibility and the various means by which help 'describing' become possible.

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Table 6.3. Typology of expressions of potential

type	main forms
modal	*can, could*
able/ability	(BE) [able] *to* HAVE [ability] *to*
existential	*it* BE [difficult] *to* [way] *to / of*
enable	X [enable] Y (*to*)

Figure 6.10 shows the extrapolated frequencies for each main potential expression type for [source] + [describe] + *wh*. Firstly, considering type instances, the first two columns in Figure 6.10, modal auxiliaries *can* and *could* (and a small number of instances of *may* and *might*) are more frequent than any other type; 'able' and 'unable' represent figures not just for BE *(un)able to* but for all other modal expressions of this type (e.g. HAVE *the ability/opportunity to*). If we look at the other types, for existential expressions we can note the relative frequency of introductory *it* expressions (labelled 'easy' and 'difficult') compared to other types (e.g. *there* BE *a* way *of*; *the* difficulty BE *to*).
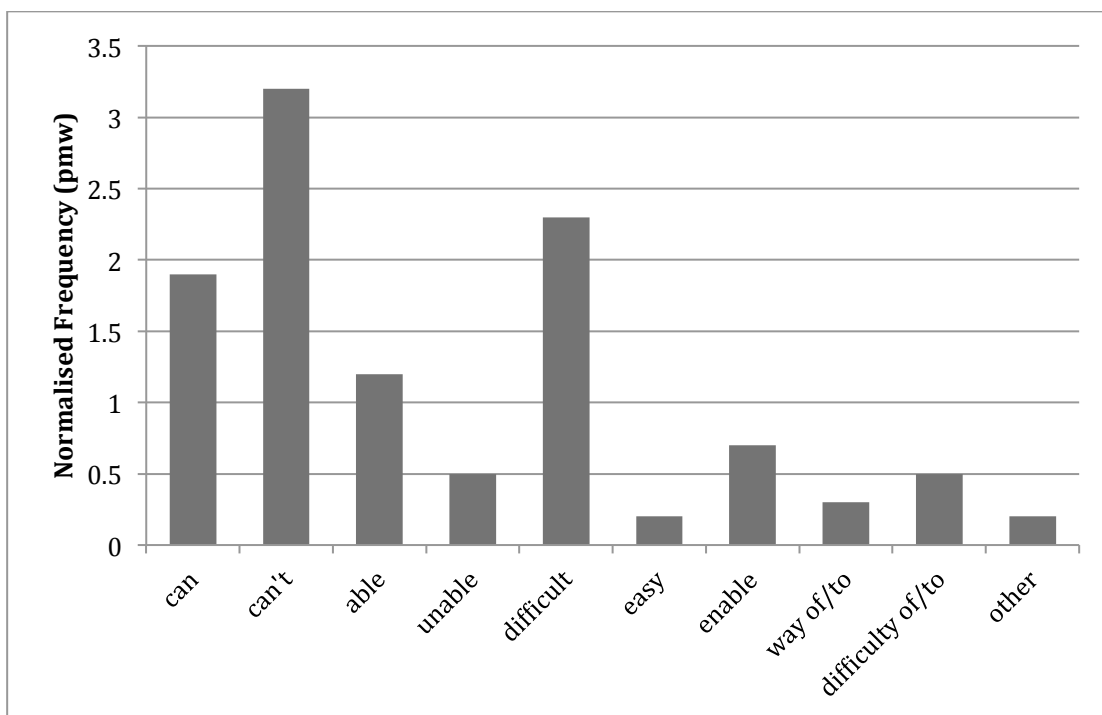
Figure 6.10. Distribution of potential expression types for [source] + [describe] + *wh*

The examples presented in Figure 6.11 show instances of 'describing' verbs with modal verbs expressing potential. As indicated in Figure 6.10, negative instances (*can't, couldn't*) are considerably more frequent than positive ones (3.2 compared to 1.9 hits pmw). This may partly be due to the avoidance of *could* in positive instances – only 21% involve *could* compared to 51% of negative instances; a similar pattern has been noted with 'finding out' and 'judging' verbs. With positive potential, all 'describing' verbs are found with no particular associations; *say* has an association with negative instances as nearly 9% of its **V wh** instances co-occur with *can't/cannot* or *couldn't/could not.*

Kjellmer (2003) argues that first person instances involving *reveal* (see line 2)

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show a weakened meaning of *can*; similar instances are analysed by Halliday & Matthiessen (2004) as expressing 'readiness'. This is because the 'revealing' is achieved in the sentence itself; it is not coincidental that the *wh*-clause here is a declarative-*how* clause, that is, compatible with a *that*-clause reading. Other similar instances tend to co-occur with *wh*-clauses that are not genuine questions. Other instances of positive *can* or *could* tend to indicate that the revealing is limited in some way (*merely* in line 1) or not possible at present (*until* in line 3).

1	Here I **can** merely	indicate how	an alternative theory might be constructed .
2	But Community Care **can**	reveal how	she so easily fell prey to her son and lost almost everything .
3	The Labour Party will not revive until it **can**	show how	to achieve jobs for all who need them .
4	Your mother **could**	explain what	happened but I have not seen her since she dialled 999 and packed her suitcase .
5	'**Can** you	say when	the body was moved?' Burney grinned sheepishly .
6	I didn't even think I **could**	explain what	I was afraid of.
7	'I **can't**	say whether	I invited it or – or not; it just happened.'
8	Without these pupils, the new schools **could not** of course	demonstrate whether	or not they could provide for them as well as the grammar schools had.

Figure 6.11. Examples of modals of potential with [source] + [describe] + *wh*

When we look at 'able / ability' type instances (see Figure 6.12) a similar picture emerges as in earlier chapters. First of all, adjectival expressions based on X BE [able] *to* constitute the great majority of instances (around 90%, or 1.5 hits pmw); around 64% of these involve (*un*)*able*; other adjectival expressions apart from

those shown in lines 3 and 5 in Figure 6.12 are *not* Adj *enough to* and BE *in a good position to*. None of these occurs more than once. We can also note that over 70% of these instances are what Smith (2003) refers to as 'syntactically motivated', that is, they occur in syntactic environments where a modal verb could not, as in lines 2-4.

In terms of nominal expressions, the main exponent is (*not)* HAVE *opportunity/chance to*. This is rather infrequent, at 0.15 hits pmw with 'describing' verbs. There are also two instances of (*in*)*ability to* (without HAVE).

1	Although Priddle **was able to**	say where	most of Britain's exports of plutonium were destined, he could not immediately account for 0-75 tonnes of plutonium from...
2	the external influence will in some cases actually be successful , and we **may** therefore **be able to**	demonstrate how	the new forms penetrate the solidary community.
3	Ayer begins , then, by arguing that anyone claiming to make a factual statement **must be capable of**	saying what	observations would count towards establishing the truth or falsity of that statement .
4	He paused, seemingly **at a loss to**	say what	he did mean.
5	Gill and Jackson **had** the ideal **opportunity to**	demonstrate how	the phenomenon of identity confusion could be understood through the process of racial discrimination in society

Figure 6.12. Examples of 'able/ability type' expressions with [source] + [describe] + *wh*

Figure 6.13 presents examples of existential expressions of potential. These instances refer to the generalised (lack of) potential of a situation rather than any specific entity. There are two main categories of expressions; adjectival ones, mainly involving introductory *it* (around 75% of the total) and nominal expressions based on *way to/of* and *difficulty* (25%).

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In terms of adjectival introductory *it* expressions, *say wh* is the 'describing' verb with the strongest association (nearly 9% of all SAY *wh* instances), particularly with estimations of difficulty or impossibility – it is significant that this same verb is also associated with *can't/couldn't*. The main phraseology, with around 2 hits pmw (80%) is *it* BE [difficult] *to*, mainly with the adjectives *(im)possible* (36% of cases)*, easy* (10%) and *difficult* (44%), which indicate different levels of potential; *tricky* and *hard* are also found. Line 4 provides an instance of a related expression, *it* BE *too soon/early to*, which accounts for a further 15% of adjectival existential expressions.

The other lines in Figure 6.13 show other, rarer expressions of potential, each of which has a few instances (no more than 0.2 hits pmw): *the problem/difficulty is* (*to/in*) and X BE *a way of/to* are those that occur more than twice, but other related expressions include *there is not sufficient evidence to, X is an opportunity to* and *the difficulty of*.

1	At the moment **it is difficult to**	describe how	the system will work in practice .
2	When viewing video […] **it is not possible to**	say which	comes first.
3	Once this result is in place **it will be possible to**	discuss how	to relate space-time curvature mathematically to mass/energy .
4	**It is too soon to**	predict whether	these will be successful in the longer-term but they … have highlighted to staff the necessity of increasing research activity.
5	**The problem is to**	explain how	individuals come to identify their interest with that of a specific group
6	If subjects are difficult intellectually, this can be recommended, as **a way of**	demonstrating what	has been covered , but speakers should always make sure that they really have covered the points properly

Figure 6.13. Examples of existential expressions of potential with [source] + [describe] + *wh*

'Enabling' expressions, which the source of the potential is made explicit, are not very frequently found with this meaning frame (0.7 hits pmw). The starting point for this group is the phraseology X [enable] Y *to*. With 'describing' verbs, this accounts for 55% of 'enabling' instances and involves the verbs ENABLE (16% of cases), ALLOW (21%) and HELP (63%). Some examples are provided in Figure 6.14; we can see that verbs in the 'show' meaning group in Francis et al. (1996) – *demonstrate, indicate, reveal,* are mainly found (60% of the time). There were no instances of X MAKE *it* [possible] *to,* but around 41% of 'enabling' expressions with 'describing' verbs involved the phraseology X GIVE/PROVIDE Y (*with*) *the chance/opportunity to*, an example of which is seen in line 5; in these instances there is no indication of whether the demonstrating actually takes or took place.

1	… the second, the availability of histological techniques which **enable** them to	specify where	a lesion has been made , after the event, even if it isn't completely possible before
2	Examinations should **enable** candidates to	demonstrate what	they can do
3	A laboratory study ... using the old ... classification of sleep stages **allowed** subjects lying In bed ... to	indicate when	they were "drifting" or "floating" by squeezing a bulb.
4	The investigators are therefore particularly concerned to design controlled trials which **help to**	reveal how	agents react to and deal with uncertainty
5	Recording of activities **provides** the student with **the opportunity to**	demonstrate how	key factors are influencing the conduct of the investigation.

Figure 6.14. Examples of 'enabling' instances with [source] + [describe] + *wh*

6.2.3 The expression of volition & purpose with [source] + [describe] + *wh*

Expressions of volition and purpose were found in around 18% of the instances of this meaning frame, at a frequency of around 15 pmw. Table 6.4 shows the main types: beyond modals and semi-modals we have adjectival BE [prepared] *to,* verbs of volition/intention with *to*-infinitive complementation and nominal [aim] BE *to*. The alternatives to modal verbs (including semi-modal BE *going to*) tend to express lower levels of commitment to carrying out the 'describing' (here). 'Trying' expressions and purpose clauses refer to goal-directed action.

Table 6.4. Typology of expressions of volition/purpose

Type	Main forms
modals, semi-modals	*will, would, shall,* BE *going to*
willing to	BE [willing] *to*
wanting	[want] *to*
aim be to	[aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose clause	*(in order) to* USE X *to*

The extrapolated frequencies (pmw) of these different types with this meaning frame are shown in Figure 6.15. While these are based on extrapolations from the sample and therefore not entirely reliable, some notable differences from other meaning frames are discernible. The most obvious one is that the reference to *lack* of volition ('not want') is much more common with this meaning frame than with others; this refers to someone refusing or not wanting to reveal information. Clearly, also, 'describing' verbs are frequently involved in purpose clauses.
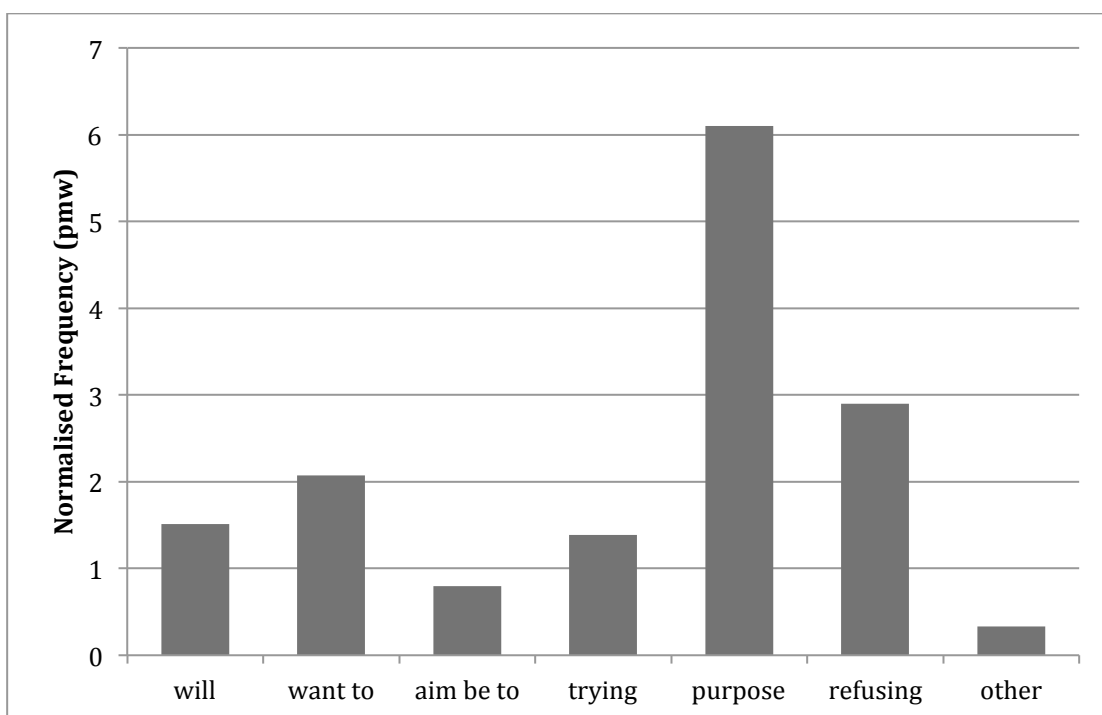
Figure 6.15. Distribution of means of expressing volition and purpose with [source] + [describe] + *wh*

Figure 6.16 provides examples of modals and semi-modals of volition with [source] + [describe] + *wh*, which occur around 1.51 times pmw. The modal *will* accounts for 86% of instances and *shall* a further 10%; the other instances involve BE going to, *would* and *would rather*. The describing verbs most associated with *will* and *shall* instances are *discuss* (7% of **V wh** instances), *demonstrate* (3.6%) and *consider* (3%). The majority – over 60% - these instances are first person promises or commitments to give information (see lines 1-3). Around a third of these first person instances involve reference to the current piece of writing (*Chapter Seven* in line 2), which perform a similar function to a further 19% where subject is the present surveys or (sections of) a publication (lines 4 and 5). We can also note

'official announcement' instances (lines 6 and 7; around 18.5% of instances), which report a third party's intention to communicate the missing *wh*-clause information.

1	Yes, I know he did. And when we talk later I'**ll**	explain what	really happened , and it won't be in the way he put it,'
2	In Chapter Seven I'**ll**	consider how	you can raise your visibility
3	Next week , I **shall**	demonstrate how	these should be used as the foundation for the financial planning necessary to establish and achieve the objectives of the client.
4	This survey of a large number of households … **will**	demonstrate how	important local taxes and services are in locational decisions.
5	the chapter will survey the law of negligence as it applies to directors, and **will**	consider whether	the role of the courts as external monitors of management efficiency could usefully be increased .
6	Tomorrow Oxford United **will** officially	reveal who	they've chosen to be their new manager .
7	Our speaker, William Lorimer, Director of Furniture for Christie's , St. James's, **will**	discuss what	to look for when buying furniture.

Figure 6.16. Examples of modals of volition with [source] + [describe] + *wh*

Figure 6.15 indicates that 'wanting' type instances of volition are relatively frequent with [source] + [describe] + *wh*, with just over 2 hits pmw. No describing verbs are particularly associated with this type of expression because, as seen for example with 'finding out' verbs (see Section 4.2.2), different verbs are attracted to particular groups of exponents: WANT *to* and *would like to* (61% of instances) attract *say, consider, discuss, reveal*, while AIM *to*, SEEK *to*, WISH *to* and SET *out to* (19% of instances) are associated with *demonstrate* and *describe*. The verbs *explain* and *show* co-occur with both types of exponent. There is also 1 instance each of PLAN *to* and PROMISE *to.* Included in this category are not just instances of volition verbs

with *to*-infinitive complementation, but also instances of related phrases with *-ing* (*directed at, focused on, devoted to*), which account for around 18% of the total; see lines 5 and 6 in Figure 6.17.

It is possible to note certain patterns of use associated with the groups of 'wanting' exponents. Firstly, there is *I want/would like to say wh*, exemplified in line 1 (35% of instances)[1]; this phraseology is notable because, although it contains a volition expression, it is not strictly 'forward-projecting' as the saying is accomplished in the uttering or writing the sentence. Sometimes this type of modal meaning is referred to as 'low degree' modality (Huddleston & Pullum 2002, Collins 2009). As with other such apparently exceptional instances (see for example 'dreading' instances in Section 5.3.3), there is an association with 'special' *wh*-clauses, here a *wh*-exclamative (three of the four instances are *wh*-exclamatives); the level of enjoyment of the *new series* is not in question here. The second usage is exemplified in line 2, where the first person speaker refers to their aims in the current book and accounts for around 17% of instances; a further 8% of instances with SEEK *to* and similar exponents replace the first person with either *the research* or reference to the current piece of writing (see *this chapter* in line 6). Finally, around 25% of instances refer to third person research (line 5) or other typically scholarly work (line 4).

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[1] this is quite a high proportion despite having only 4 raw occurrences because it involves the most frequent 'describing' verb *say*

1	Dear Kate , I **would like to**	say how	very much I am enjoying Mary Thomson's new series.
2	Wherever you may locate your own particular response, I **want** in this book **to**	discuss what	is involved in giving RE the positive and creative image which it should have
3	The research **seeks to**	explain why	and how this dramatic reversal in economic fortunes has occurred.
4	Having **set out to**	demonstrate how	... Marxism was in a position to forecast the future, he came to the conclusion that [...]
5	Thus, in social science much research activity **is directed at** simply	describing how	things work , how conversations are organised [...]
6	This chapter **has been devoted** principally **to**	describing what	happens ; the rest of the book is concerned with understanding this rather complex picture .

Figure 6.17. Examples of want type expressions with [source] + [describe] + *wh*

The phraseology *the* [aim] (*of* X) BE *to* is quite infrequent, only occurring around 0.6 time pmw with this meaning frame; *demonstrate* is the 'describing' verb most associated with this expression. As with 'finding out' and 'judging' verbs, the main nouns are *aim* and *purpose*, accounting for over 80% of these nominal modal expressions of volition. Some examples are shown in Figure 6.18; other nouns found are *intention, function, objective, concern, idea* and *thrust*. Around 41% of instances are linked to the current piece of writing – either by pointing out that it is *our purpose* (line 1) or through reference to part of the writing (*the next two chapters* in line 3). The other instances refer to the aims of third parties; we can see here examples of *works* (line 2)*, conferences* (line 4) and activities (line 5).

1	**It has been our purpose** here **to**	indicate what	has been successful in the past
2	Indeed the **aim** of the work **was to**	demonstrate how	far he had fallen from ancestral glories
3	3.0 Introduction **The purpose** of the next two chapters **is to**	consider how	far the practical analysis of language use in live speech communities can contribute to our understanding of language change.
4	**The declared aim** of the conference **was to**	discuss how	to build a movement for socialist-feminism
5	Shortwood attracts thousands of visitors and **the idea** behind the revival of the horse powered cider mill, **is to**	demonstrate how	life used to be down on the farm .

Figure 6.18. Examples of aim to with [source] + [describe] + *wh*

The reference to purpose by means of 'trying' expressions and purpose clauses has a close affinity to volition, with the main distinction being that the former imply goal-directed action. As in earlier chapters, 'trying' expressions with [source] + [describe] + *wh* mainly involve instances of TRY *to* (56% of extrapolated instances) and ATTEMPT *to* as a noun (7.5%) and as a verb (19%). Other forms with similar meanings that were identified in the concordance analysis of this meaning frame are the verb ENDEAVOUR *to*, *did everything I could to* and BE *careful (not) to*. The overall frequency of 'trying' exponents with this meaning frame is around 1.38 hits pmw. Unlike other meaning frames, here a relatively low proportion (14%) occur in *-ing* forms; this may explain why 'trying' expressions are comparatively less frequent with this meaning frame than with others where high numbers of instances of *trying to* **V wh** were found. The lower incidence of *–ing* forms may also be due to the fact that a significant proportion of these instances (38%) are like lines 1-3 in Figure 6.19 in that they report the aims of the current text and the distinction

between 'trying' and verbs such as AIM *to,* which avoid *–ing* forms, largely disappears in these instances.

Line 4 is interesting from two points of view. Firstly, it shows that the demonstration or explanation can be in terms of actions as well as words. Secondly, the coordinated clause following the **V wh** clause in this sentence - *and they achieved considerable success* - points to the lack of certainty implied in the wording *attempted to demonstrate how* in that the writer feels the need to add this disambiguation. The final example in line 7 is one of a few instances of 'trying' *not to* (8.5% of the total), which all occur with *reveal* or *show* and either with embedded exclamative clauses or declarative *how.*

1	But for the rest of this section we **will try to**	explain how	the sentencing decisions of the two levels of court contribute to the crisis.
2	This chapter **tries** to do three things: 1 . **To**	explain why	students need critical thinking skills. 2.
3	This detailed archive report **attempts to**	explain what	each group of contexts represents
4	They **attempted to**	demonstrate how	the Spanish influence was absorbed into the Andean vision of the world and they achieved considerable success.
5	**Trying not to**	reveal how	very aware of him she was , she asked with a fair degree of composure, 'How will we be working together?'

Figure 6.19. Examples of 'trying' expressions with [source] + [describe] + *wh*

Figure 6.14 showed 'purpose'-type instances are more frequent than other ways of referring to volition and purpose with this meaning frame, at around 6.1 hits pmw.

From the concordance analysis it was possible to discern certain common meanings of the main clauses. In terms of [source] + [describe] + *wh*, the instances in Figure 6.20 indicate the main meanings, as well as the fact that the 'describing' verbs most associated with purpose clauses are *discuss* (10% of its **V wh** instances), *demonstrate* (9.5%)*, show* (7.5%) and *explain* (6.5%).

The largest set of meanings (around 35%) involve the verb USE with, for example, *models* (line 3), *scenarios* (line 7) and *theories* (line 8); we can also note *trick* in line 9. Closely related to these are examples relating to selecting or giving *examples* (lines 5 and 6), sometimes involving the relating of stories (line 1; around 30%). In around 8% of instances, the 'example' is an action carried out which gives evidence of what the source is trying to show (line 11). There are few examples – only around 5% of the total – of experiments or research processes although these were commonly found with 'finding out' and 'judging' purpose instances in Chapters 4 and 5. Such differences are to be expected bearing in mind the meaning of this meaning frame, which involves an entity imparting information. We can note in this regard that, particularly with instances of *demonstrate* and *show* where the main clause is not modal, there is a higher incidence of both *wh*-exclamatives (lines 6, 11 and 12) and declarative *how* (line 9 includes a *how*-clause that is very close to a *that*-clause). The significance of this is that these *wh*-clause types are not 'genuine' since there is very little missing information.

1	The one thing that drew me to Elsie was her disability. **To**	explain why	that aspect interested me particularly I **have to** tell you about the Butcher .
2	In order to	describe what	is common to all instances of the concept **it is necessary to** talk in terms of relations within (or between) particular totalities [...]
3	This **model** will be of relevance to the smaller company and **could be used to**	demonstrate how	such companies can profitably engage in product concept testing .
4	In chapter four below , **there will be an examination** of her poetry to	demonstrate what	sorts of books Leapor read, and especially those that made a strong impact on her work .
5	In this, the second annual report on our environmental activities, **a range of examples are given to**	demonstrate how	ICI has responded to the environmental challenge opposite each of our objectives.
6	The **example is chosen simply to**	demonstrate how	sadly lacking we are in the very facilities which historians require most
7	This is an, a product of evolution, admittedly Freud **uses a Lamarckian scenario to**	explain how	it got there, but the fact is that Freud insisted on it .
8	It was J. J. Berzelius […] who […] put atomism on a much more secure footing . He **used it to**	explain how	different chemical compounds may contain the same elements in the same proportions
9	He **used** the old but very effective **trick** of balancing a five-pound note on a club head to	demonstrate how	this changed the swing-weight quite significantly.
10	She yawned, to	show how	tired she was , and to her dismay found her excuse was genuine.
11	Dear Rab. Just a line to	say what	a beastly profession I think politics are

Figure 6.20. Examples of purpose clauses with [source] + [describe] + *wh*

In turn, the instances from line 5 onwards in Figure 6.20 have a 'result' reading

mentioned in Halliday & Matthiessen (2004) for some instances of *to*-infinitives. In

performing the action (*giving an example*, *yawning* etc.), the demonstration or

explanation is achieved. This result reading is not clearly distinct from the purpose

reading, nor is it definitively devoid of modal meaning, as line 5 indicates. It is also interesting to note the similarity between line 12 and examples of *I want/would like to say wh* seen above.

One of the distinctive features of expressions of volition and purpose with this meaning frame is the relatively high incidence of expressions of *lack* of volition, refusing and not 'trying'; these have a frequency of around 2.9 hits pmw, and account for over 30% of the totals for volition and purpose with this meaning frame. The 'describing' verbs most associated with lack of volition are SAY and REVEAL with over 8% of their **V wh** instances.

Similar forms are found for 'lack of volition' as for volition (see Figure 6.21), the first difference being that, while there are no examples of *it not* BE *the* [aim] *to*, around 18% of lack of volition instances are adjectival expressions of the form X BE *reluctant/unwilling/loath to* (see lines 7 and 8). A second main difference is that, with these expressions the subjects are invariably people or organisations, and not documents. The most frequent type of expression is REFUSE/DECLINE *to* (48% of instances), which is found almost invariably in the past tense. The modals *will not / won't / wouldn't* account for around 24% of instances; they co-occur with the same verbs as REFUSE/DECLINE *to* (*discuss, reveal, say, specify*), which accounts for their similarity in meaning and why *refuse/decline* are commonly used to paraphrase volitional *wouldn't/won't* (e.g. Coates 1983). Apart from the greater flexibility provided by REFUSE/DECLINE *to* compared to *won't / would not* (e.g. lines 3 and 4, where a modal verb is not possible), the evaluative nature of a refusing verb is

more explicit. It seems possible to make a distinction between strong, outright refusal instances and the generally weaker implication of adjective expressions with BE *reluctant / loath / unwilling to* and *not* WANT/DARE *to* (8.5% of instances).

1	GCHQ 's trying to cut staffing levels within the next two years, but **won't**	specify how	many people must leave by then .
2	The spokesman **would not**	reveal what	the results of the survey were -- or how many members refused to answer the questions .
3	The managing director ... was unavailable for comment . He **has** so far **refused to**	indicate whether	he intends to appeal.
4	The Sun also agreed to pay costs in the action,' the spokesman said, **declining to**	reveal how	large the costs were .
5	ALCOHOLIC Keith Chegwin and his estranged wife Maggie Philbin yesterday **refused to**	say if	they were getting back together.
6	Until the respective commissions have finished drawing up their lists, ministry officials **are reluctant to**	predict how	many claims are likely to be made .
7	No-one in the England camp **was prepared to**	say whether	there was less longing for the next tour of the Caribbean or to Pakistan
8	Although some Treasury ministers have hinted that economic recovery is in sight, no one on the Government benches **has dared**	predict when	unemployment will cease its remorseless rise.
9	As she **did not want to**	reveal how	much Shildon had reported, she had to sit again through the complicated story of the sale of the lease .

Figure 6.21. Examples of lack of volition and refusal with [source] + [describe] *+ wh*

6.2.4 The expression of uncertainty with [source] + [describe] + *wh*

There are relatively few instances of uncertainty with this meaning frame – around 3 pmw, or around 3.5% of all instances. These are distributed according to the

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different types as shown in Figure 6.22, from which we can see that modal verbs of uncertainty have the highest frequency, followed by *yes-no* questions.
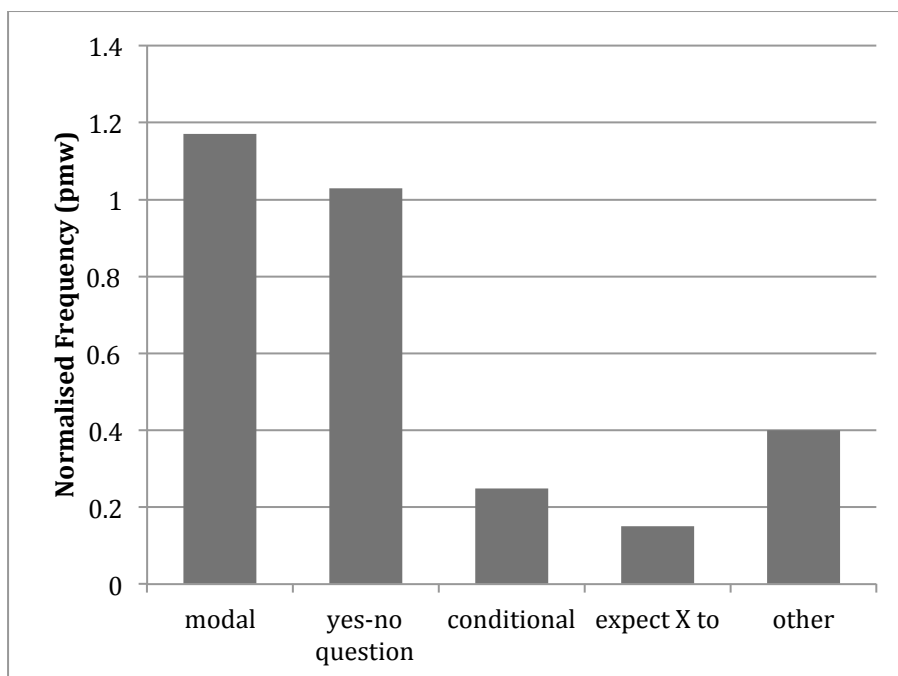
Figure 6.22. Distribution of exponents uncertainty with [source] + [describe] *+ wh*

In terms of modals of uncertainty with this meaning frame, which co-occur with a frequency of around 1.17 pmw, a range of 'describing' verbs are involved in these instances; no verbs show a particular association. Around 60% of instances indicate high certainty using *will*, 60% of which relate to documents or texts (line 3), involving the verbs *show*, *reveal*, *indicate* or *specify*. A further 16% of instances involve *would*, around half of which are, like line 1 reported/past cases of *will*. Other, harmonic expressions of uncertainty combine with modal verbs in around 18% of cases; the italicised *thinking that* and *feel sure* in lines 1 and 2 are

examples. Line 2 combines what for Halliday (1994) are explicit (*I feel sure*) and implicit subjective judgements; the effect of *I feel sure* seems to reduce the level of certainty. Even where these are not found, almost invariably some other modal marker is found in the same sentence or the following/previous sentences, as indicated by the examples (italicised items). Where no such marker is found, as in line 5, the interpretation may become less certain; there are in fact three such instances of research or reports which *should show/reveal/demonstrate* the answer to a question. In such cases there seems to be a combination of meanings of uncertainty ('it is likely that') and desirability ('it is important that') noted by Coates (1983) for the similar *ought (to).*

1	I glanced at Lili *thinking that* she must know and **would** somehow	reveal what	was disturbing him .
2	*I feel sure* he **will** guide you towards the right medical channel and	explain what	pica is all about .
3	A 'notice to warn' *might well* be served for example upon a car manufacturer if it appears that a certain model had a dangerous design fault. The notice **will**	specify what	steps the manufacturer must take .
4	No. 21 One part of a sentence **may**	indicate what	the second part *is likely to* be.
5	From February, 1992, the UK Department of Health sponsored the broadcast of television commercials designed to alert parents to the dangers of VSA. The next report on VSA deaths **should**	reveal what	effect, if any, this campaign has had.

Figure 6.23. Examples of modals of uncertainty with [source] + [describe] + *wh*

As shown in Figure 6.22, apart from *yes-no* questions, whose relatively high frequency (1 pmw) is due to their association with the frequent verb SAY, there are relatively few other exponents of uncertainty with this meaning frame. Examples

are provided in Figure 6.24. The modal meaning of *yes-no* questions has been observed in the literature, since they indicate the ignorance of the speaker (Huddleston & Pullum 2002), like the example in line 1. Lines 2 and 3 show examples of conditionals (0.25 pmw). The 'hypothetical' or 'unreal' conditional in line 2 with past tense *said*, suggests low likelihood that this will happen, while the other (reported) conditional is more open to the possibility of the revealing taking place – we are not told whether it did, however. Line 4 includes the expression EXPECT *X to* (0.14 pmw[1]) which is potentially ambiguous between an obligation ("I thought the book should") and an uncertainty ("I thought it likely that the book would") reading. In this case, the basis for the expectation (*because of this background*) is supplied. Other uncertainty exponents only occurring once with 'describing' verbs are BE *likely to*, HOPE *that* and ENSURE *that*.

1		Do you	discuss how	these ideas have been influenced by the mass media as well as by the fine arts?
2		Downs said: 'If I	said what	I really thought about the ref, they would lock me up and throw away the key.'
3	the gang [...] told them they would be stabbed **if they did not**		reveal where	their valuables were .
4	Because of this background, I **expected** a book called Feminism for Beginners **to**		explain why	all this happened when it did.

Figure 6.24. Examples of uncertainty expressions apart from modal verbs with [source] + [describe] *+ wh*

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[1] including one instance of BE *due to*

6.2.5 Negative [source] + [describe] + *wh*

The instances of 'describing' verbs which are straightforwardly negative have an extrapolated frequency of 4.3 pmw. These instances are not of particular interest because they are not modal. However, it is interesting to note that SPECIFY *wh* has a very high proportion of negative instances (23%); SAY (8.7%) is also associated with negative instances, continuing a pattern already seen with SAY in co-occurrence with 'potential' and 'volition' expressions. The examples provided in Figure 6.25 suggest that reference to not specifying, revealing, indicating etc. implies that the missing information is of interest and should be revealed, or may be revealed soon (line 5). In line 2, for example, the missing information in the *wh*-clause is seen as necessary to back up the claim made by the authorities.

1	As you are probably aware the Directive **does not**	specify how	emissions from existing plants should be reduced.
2	The authorities claimed that ... Silva was rearrested because he had contravened the conditions of his earlier release, although they **did not**	specify how	he had done this .
3	baby-faced double killer was jailed for life ... **without**	revealing why	he murdered two pretty teenagers .
4	The Commission **has not** stated or	indicated which	countries are discriminating against financial institutions from EC member states
5	So far ICI **has not**	revealed what	its defence against takeover would be .
6	She **had** deliberately **not**	revealed what	she was looking for, and so insisted on evacuating every office before she began work .

Figure 6.25. Examples of negative instances of [source] + [describe] + *wh*

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6.2.6 Indicative [source] + [describe] + *wh*

Instances of indicative [source] + [describe] + *wh* account for 39% of all instances of this meaning frame and have a frequency of around 33.8 pmw. Some examples can be seen in Figure 6.26. Around 88% of these instances either involve a report of a third party (53%; see lines 1, 2, 4 and 5) or reference to a text (35%; see lines 6 and 7) describing the answer to a question. These instances show a high incidence of declarative-*how* or at least *wh*-clauses that have such a reading (around 30% of instances), a tendency that is particularly seen with TELL (68% of indicative instances) and DESCRIBE (58%); examples are shown in lines 2 and 5.

1	Simmons (1978) has	considered how	it may provide a more generally applicable theme
2	The seers , when they approach the farthest regions of mysticism ,	describe how	they return baffled from the ultimate experience .
3	Moreover, in Chapter 10 we	discussed how	large firms enjoying a significant but not prohibitive entry barrier could erect strategic entry barriers to consolidate their market power.
4	Bob Torrance	reveals how	to make the best out of your practice sessions .
5	A MOTHER	told how	getting up for a drink of milk saved her family from a house fire .
6	The report	describes how	in recent years hundreds of political activists ... have been subjected to arbitrary arrest and torture
7	Chapter 9	considers who	can act as an expert

Figure 6.26. Examples of indicative [source] + [describe] + *wh*

6.3 Asking and questioning frames

This second group of 'communicating' meaning frames includes frames with the verbs ASK, WONDER and QUESTION. As Table 6.5 shows, there is general agreement across previous studies that these verbs have similar meanings, but not complete consensus over how they should be grouped. It should also be recalled that, apart from Francis et al. (1996), and, to a limited extent, Biber et al. (1999), the studies listed avoid the issue of the polysemy of these verbs and make no claim to a comprehensive coverage of the verbs concerned, which probably explains the absence of QUESTION from Karttunen's (1977) list. As noted in Chapter 2, QUESTION does not feature in the **V wh** list provided by Francis et al. (1996) because it is not listed in the CCED as having this pattern.

Table 6.5. Classifications of ASK, QUESTION and WONDER in previous studies

study	meaning groups	example verbs
Karttunen (1977)	inquisitive verbs	*ask, wonder*
Francis et al. (1996) V wh pattern	ASK	*ask*
Biber et al. (1999)	Speech act verbs	*ask, question*
Trotta (2000)	Inquiry	*ask, question*
Huddleston & Pullum (2002)	Asking Disbelief	*ask, wonder question*

The concordance analysis of **V wh** verbs carried out in this study suggests that

there are three main aspects of meaning relating to these verbs that are prioritised in different ways in the literature: the extent to which attention is paid to the distinction between indirect and reported questions and the aspect of 'disbelief' expressed particularly by the verb QUESTION, noted by Huddleston & Pullum (2002). These aspects are illustrated by the examples provided in Figure 6.27. Lines 1 and 2 are reported questions, which, as line 2 shows, extend to the reporting of requests (note the use of *could*). In contrast, lines 3 and 4 are indirect questions, where the utterance itself functions as asking the embedded question, even though the clause type is not consistent with the posing of a question or its literal interpretation is not a request for information, but, for example, a request for permission to ask the question (Huddleston & Pullum 2002). Lines 5 to 7, meanwhile, illustrate a different use of these verbs, where the function is not to raise a question but to express disbelief. This interpretation depends on a reading of the *wh*-clause as a 'biased' embedded question, 'biased questions' being questions 'where the speaker is predisposed to accept one particular answer as the right one' (Huddleston & Pullum 2002: 879). The bolded items in these lines indicate a biased reading.

It is also important to note that the inclusion of WONDER amongst verbs included in these meaning frames is not uncontroversial. Other classifications of verbs that licence *wh*-clauses are far from in agreement as to the status of this verb: Francis et al. (1996) class it in their 'THINK' group; for Biber et al. (1999: 686) WONDER is a 'Cognition verb'; Trotta (2000) includes it under

'Perception/Reflection'; Huddleston & Pullum (2002: 976), however, put it in the 'Asking' group. Instances of WONDER have been grouped with ASK and QUESTION where the 'wondering' appears to be an instance of communication with an audience; as lines 1 and 7 in Figure 6.27 suggest, this interpretation is more obvious where first person or generic *you* is found.

1	People often	ask what	finds' we have made .
2	Soaked with it and languid from the heat […] I	asked	if we *could* stop at the high slope of grass off Elderberry Road .
3	'May I	ask where	you were, at the time of your husband's death?' he said evenly.
4	All right I	wonder if	you *could* ask him if he 'd like a coffee or tea and erm er er just wait for me.
5	recalling the swashbuckling victory in Yugoslavia that sent England to the European Championship, one	questions whether	**any** genuine progress has been made.
6	But at some point we are bound to stop and	ask if	what we are studying, however important it may be in its own terms, is **sufficiently** central to its presumed subject.
7	'This is the final straw. You	wonder if	all the effort everyone has put in is **worthwhile**. I cannot understand what pleasure they derive from it.'

Figure 6.27. Examples of ASK, QUESTION and WONDER with reported and indirect questions

As these examples suggest, both reported and indirect questions generally involve either ASK (75% of ASK *wh* instances) or WONDER (56% of 'communicating' instances of this verb). In such cases, the subject referent is ignorant of the answer but is interested to know it; for this reason they were grouped together in the meaning frame [inquirer] + [ask] + *wh*. In contrast, instances expressing 'disbelief' are more associated with QUESTION (96.5% of 'communicating' instances of

QUESTION *wh*), with fewer instances of ASK and WONDER. In these cases, the subject referent expresses an attitude of doubt or suspicion regarding the answer to the *wh*-clause question. On this basis, the meaning frame [commentator] + [question] *+ wh* was formulated. Neither of these meaning frames is associated with modal meanings to any great degree, which is associated with their 'question-orientation' (see Section 2.6). Their description will accordingly be quite brief.

6.3.1 The meaning frame [inquirer] + [ask] *+ wh*

As noted in section 6.3, instances classed as [inquirer] + [ask] + *wh* report on or actually carry out a request for information or permission, and therefore express the inquirer's ignorance as to the answer. The verb most associated with this meaning frame is ASK, but we also find instances with WONDER and QUESTION. It was also noted that this meaning frame is not associated with expressions of modal meaning; Figure 6.28 indicates the distributions of different types, which clearly shows the predominance of instances where no modal meaning is found ('indicative', 'negative' and 'other' instances account for 83% of the total). It does not, however, show that, since the samples are based on only a few verbs, in cases other than 'indicative', very few instances are found; these instances almost invariably involve ASK. With this in mind, only types found more than once will be mentioned.

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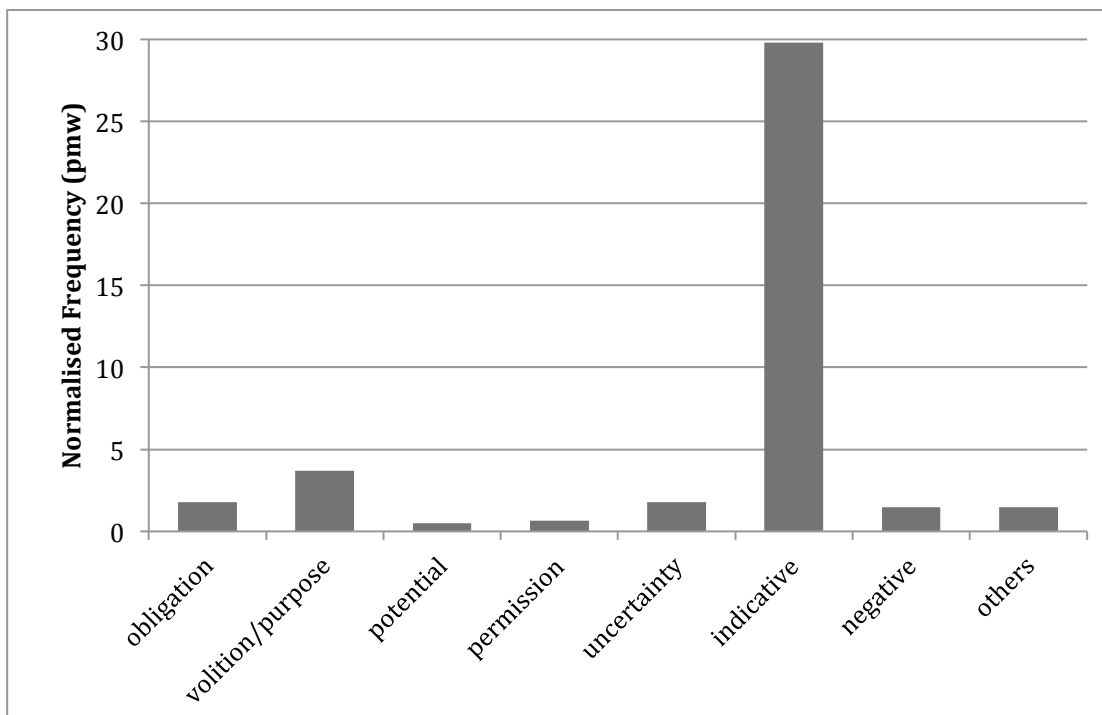
Figure 6.28. Distribution of modal and non-modal meanings for [inquirer] + [ask] + *wh*

In terms of expressions of obligation with this meaning frame, the frequency is around 1.8 pmw. Two examples are provided in Figure 6.29. We can note imperatives used to give advice (line 1), where the listener gains an advantage. Line 2 is an example of an introductory *it* expression here used to advance an argument (Van linden 2011).

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1	If you don't understand what someone is describing,	ask what	they mean.
2	As it is from the children of the semi- and unskilled working class who leave school without any qualification that the underclass is being recruited, **it is important to**	ask which	children are most likely to fall into this category. Chapter 3 detailed the educational performances of the poorest children.

Figure 6.29. Examples of expressions of obligation with [inquirer] + [ask] + *wh*

Figure 6.30 includes examples of repeated expressions of volition and purpose with this meaning frame (3.6 hits pmw). These involve 'wanting' verbs (line 1; WANT *to* is also found) – in this example, *ask* is similar in meaning to *discuss* or *consider,* which have similar instances in [source] + [describe] + *wh.* It is interesting to note that the majority of instances (8 out of 13) relate to reluctance or not wanting to ask; this parallels the higher prevalence of lack of volition with 'describing' verbs seen in Section 6.2.3. Lines 2 and 3 are examples where reference to the (lack of) inclination of the subject-referent is made. It seems possible to associate FEEL *too* Adj *to* with the adjectival phraseology BE [prepared] *to* seen with other meaning frames, while *not* LIKE *to* is an exponent of 'wanting' verbs not seen elsewhere. In terms of purpose instances, all of these involve a human subject referent contacting a third party (in writing or by telephone, as here) to make a request.

1	in the present context I **would like to** focus attention upon two more recent phenomena, and **to**	ask whether	or not they can be considered as major changes of political regime.
2	She wore this lovely flowery dress last week though I **felt too shy to**	ask where	she got it.
3	But I will not enjoy it and I have an infection.' He **didn't like to**	ask what	the infection was. Perhaps she was misusing English.
4	Mr Carter **rang** the White House **to**	ask if	a reconnaissance satellite could be repositioned.

Figure 6.30. Examples of volition with [inquirer] + [ask] + *wh*

In terms of the expression of uncertainty with this meaning frame, the frequency is around 1.8 pmw. The majority involve modals of uncertainty and these are shown in the first three lines of Figure 6.31. These indicate different levels of certainty from high confidence *will be asking* to lower certainty *might ask.* Line 3 shows the harmonic combination of *hope (that)* and *would not* to report worry about whether the question would be asked.

Line 4 involves a request for permission acting as an indirect question; 4 instances of *may I ask wh* extrapolate to around 0.6 hits pmw. This is the only type of modal meaning that is associated with indirect, rather than reported questions. Line 5 shows an example of potential deriving from the situation (3 instances).

1	In most cases we **will** be	asking when	a particular parish or set of parish boundaries was first defined, and if that was the date of its origin or if it is older .
2	They **might**	ask if	you know if Sunil had any dealings with Billy Tuckett …'
3	He *hoped* she **would not**	ask who	'they' were.
4	Thank you, sergeant,' she said. '**May** I	ask where	you were , at the time of your husband 's death?' he said evenly.
5	Yeah. ask it questions, it's obviously on the telephone because you **can**	ask what	the balance is and it will tell you

Figure 6.31 Uncertainty instances of [inquirer] + [ask] + *wh*

With negative instances of 'asking' (1.5 hits pmw) – see Figure 6.32 – it seems that the fact that a question was not asked requires some kind of explanation. This may be to express criticism or imply the question should have been asked (lines 1 and 2) or to provide a reason for not asking (line 3).

1	But the police never **thought** to	ask if	there was one missing, because the lady of the house was fast asleep in bed, wasn't she?
2	**I always regret that** as a youth it never occurred to me to	ask why	they chose Easingwold
3	These PMR systems were even less secure than land lines so he **did not**	ask what	the problem was .

Figure 6.32. Negative instances of [inquirer] + [ask] + *wh*

Considering indicative instances of this meaning frame, we have noted already the distinction made between reported questions (lines 1-4 of Figure 6.33), which are far more associated with ASK, which accounts for 90% of indicative instances of reported questions and indirect questions, which involve WONDER 91% of the time (lines 5-8). Around 75% of reported questions are past questions. Reported

direction questions (25%) invariably ask for permission to do something (see line 3). With examples of WONDER occurring in this sequence, it is usually only obvious from the co-text that the 'wondering' was expressed, for example if a response is also reported, as in line 4.

1	Throughout the campaign we	asked	what people thought were the main issues being stressed by each of the parties .
2	The sweet warm wine , and too much food . She	asked	if I had heard from you and said that she wished to read the novel you were writing
3	Sara had been a little distraught when Jenny had	asked	if she **might** bring James.
4	Answering two Australian journalists who	wondered whether	whether Major would rather watch the Games in Sydney or Manchester, he smiled and said: 'We look forward to welcoming both you Australians here in 2000.'
5	He was motionless as he observed her agitation. 'I	asked if	you felt morally comfortable with this assignment, Caroline.'
6	I 'm not. I 'm simply	asking why	you 've suddenly started calling her Linda.
7	All right I	wonder if	you could ask him if he 'd like a coffee or tea and erm er er just wait for me.
8	So to what do I owe this honour?' she asked instead. 'I was	wondering if	you'd like to go out with me?'

Figure 6.33. Indicative instances of [inquirer] + [ask] + *wh*

Other 'asking' instances are indirect questions, that is, while the question itself is embedded and so is not the direct illocutionary act, the force of the utterance is interpreted as posing the question. In such cases, the (first person) speaker chooses not to express the question directly for various possible reasons including wishing to downplay imposition, a negative politeness strategy (Brown & Levinson, 1987). Other examples indicate that indirect questions have further functions, including making the question more forceful (line 6) and for repeating a question

(line 5). Where direction questions are involved, for example, line 7, we almost invariably find closed interrogatives and 'past' forms of modal verbs (i.e. *could* instead of *can*) in the *wh*-clause.

6.3.2 The meaning frame [commentator] + [question] + *wh*

This meaning frame is distinguished from 'asking' by its use to express doubt or criticism about a situation or proposition. Various features distinguish it from [inquirer] + [ask] + *wh,* even though the same verbs are involved in both sequences. First of all, as noted in Section 6.3, this frame is more associated with the verb QUESTION with fewer instances of ASK and WONDER. Secondly, the *wh*-clauses found are (embedded) 'biased questions', that is, questions "where the speaker is predisposed to accept one particular answer as the right one" (Huddleston & Pullum 2002: 879). These biased *wh*-clauses commonly include one or more of the following features: negative polarity; a modal verb or modal-like expression; an evaluative adjective, for example, *sufficient*; adverbs expressing doubt such as *actually*, *still*, and *really.*

As with 'asking' instances, more than 80% of instances are not modal, but indicative, negative or other (see Figure 6.34). However, there is some interest in comparing the obligation and uncertainty instances.

320
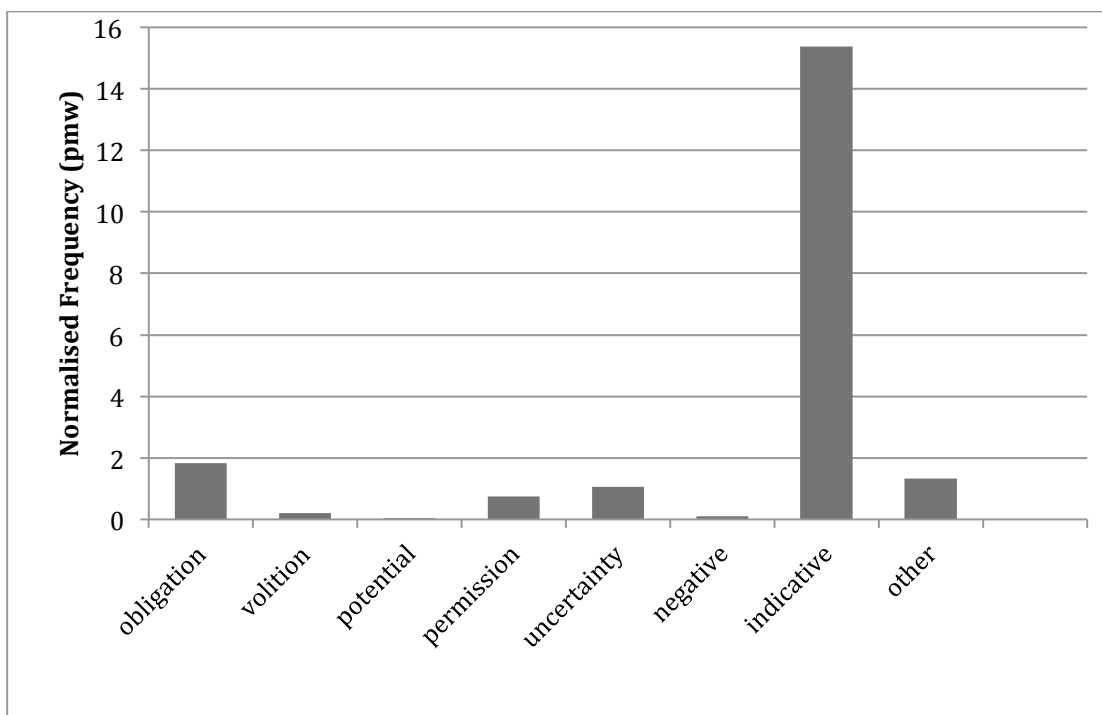
Figure 6.34. Distribution of modal/non-modal meanings with [commentator] + [question] + *wh*

6.3.2.1 The expression of obligation with [commentator] + [question] + wh

While instances of obligation only account for around 9% (1.8 pmw) with this meaning frame, the instances that do occur in this group raise some interesting questions regarding the analysis of modal meaning. Figure 6.35 shows the estimates of frequencies of different exponents of obligation. Although the small numbers of instances (45 in total) make any comparison of frequencies rather unreliable, the distribution indicates that imperatives and [task] BE *to* expressions are not found with [commentator] + [question] + *wh*. Modal and semi-modal instances account for nearly 75% of instances.

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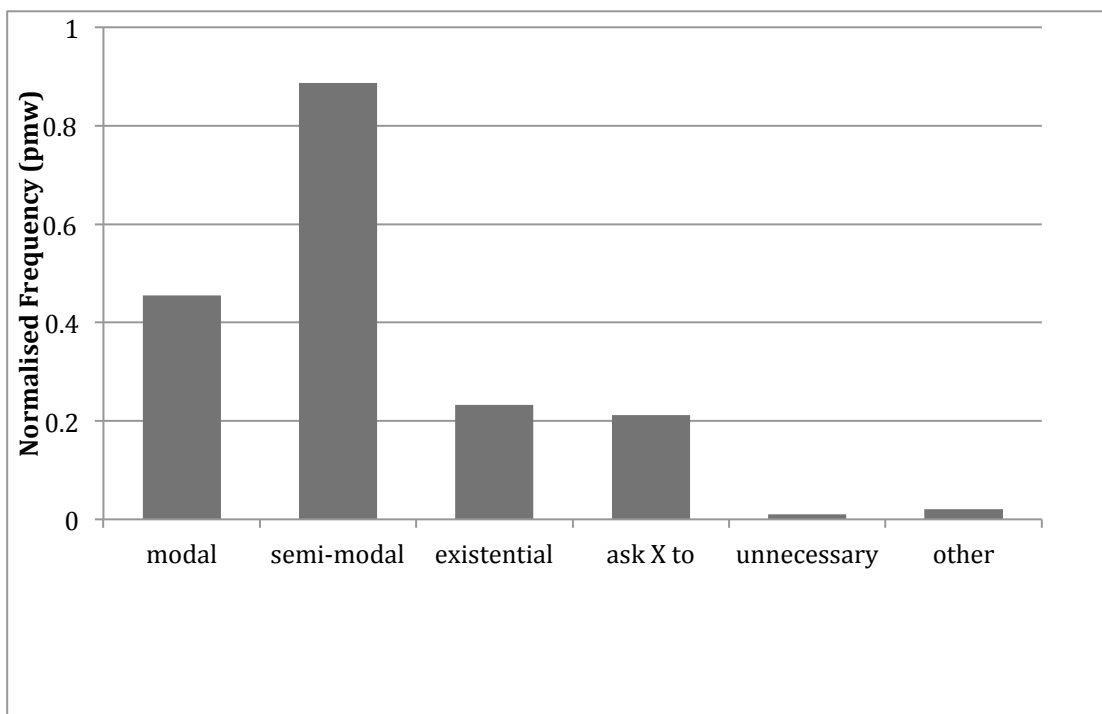
Figure 6.35. Extrapolations of types of obligation expression for [commentator] + [question] + *wh*

Due to the low numbers of instances of obligation with 'questioning' verbs, examples of all the types are presented together in Figure 6.36. This allows for easy comparison of their uses. As the examples suggest, only ASK and QUESTION occur with instances expressing obligation; QUESTION (14.5% of QUESTION *wh* instances) is more associated with this type of meaning. The subjects in instances involving modals and semi-modals (including BE *bound to[1]*) are restricted to *we, one* and *you* in 85% of cases; Line 5 is an example of the rarer use of past

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[1] this is an example of a widely recognised 'semi-modal' (Quirk et al. 1985, Palmer 1990, Francis et al. 1996, Collins 2009) which was only found once in this study

reported obligation.

The meaning typically expressed, then, is self-exhortation (Coates 1983) and is associated with either items justifying the questioning (*it is right that* in line 1) or markers of concession (*but* in line 2). The other characteristic of these instances is that the 'questioning' is achieved in the utterance; in these cases, it seems to make little difference to the meaning whether one says (for line 2) *we must ask whether...* or *we ask whether...*, giving further examples of 'low degree' modality (Huddleston & Pullum 2002, Collins 2009). As Kjellmer (2003) remarks with regard to similar instances, the use of a modal verb here serves an interpersonal function.

The association between 'questioning' and providing justification for doing so can explain why the existential expressions found (see lines 7 and 8) are not of the sort seen with other meaning frames (i.e. based on *it* BE [important] *to*) but instead involve the adjectives *legitimate, reasonable, appropriate* and *salutary*, offering speaker evaluation of the legitimacy of the 'questioning'.

The final two examples in Figure 6.36 show examples of X [ask] Y *to* and X BE [asked] *to*, which account for around 11% of obligation instances with this meaning frame. They both report the need to question predicated on third parties; line 9 shows an indirect way of suggesting that the questioning is necessary for counsellors [compare: *I urge you to question…*] while line 10 reports a need for students.

1	In our efforts to promote extensification of livestock production, *it is right that* we **should**	question whether	livestock production should be allowed unrestricted use of technology in order to produce maximum output from the minimum amount of land.
2	In deciding to get together the two firms reveal that they think this union will be in their private interest, *but* we **must**	ask whether	mergers are in the public interest
3	One **has to**	question if	these pieces justify the enormous amount of rehearsal they require .
4	Erm and *although* they may say they're noise tested, erm I think you**'ve gotta**	question whether	they're noise tested to the level.
5	Heseltine said that the government 'carefully evaluates directives' before agreeing to them and on occasion **had needed to**	question whether	other countries were honouring their commitments .
6	*But* at some point we **are bound to** stop and	ask if	what we are studying, however important it may be in its own terms, is *sufficiently* central to its presumed subject.
7	Perhaps now **might be the point to**	question whether	this type of analysis belongs in Screen *at all*
8	**It is legitimate to**	question whether	it is the LTA 's job *at all*, to produce players, much less, exclusively, its right .
9	This chapter does not **ask** counsellors to pretend to be doctors, but **to**	question whether	ill-health is *not* more concerned with social/emotional factors
10	At school and university people **are encouraged to**	question why	things must be done, rather than accept orders passively.

Figure 6.36. Examples of obligation with [commentator] + [question] + *wh*

What is interesting about obligation with this meaning frame is that it is mainly framed as providing justification for the questioning (or criticism) of the *wh*-clause, which becomes more of a proposition than a question. Under these circumstances, instances of expressed obligation such as *we are bound to* line 6 merge meanings of obligation and uncertainty (prediction – this is bound/very likely to happen). Some similar instances are seen in the next section.

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6.3.2.2 The expression of uncertainty with [commentator] + [question] *+ wh*

When we turn to expressions of uncertainty with [commentator] + [question] + *wh* again low numbers of instances are found; just over 1 hit pmw and only 5% of 'questioning' instances. Around 66% of instances involve modal verbs, as shown in Figure 6.37.
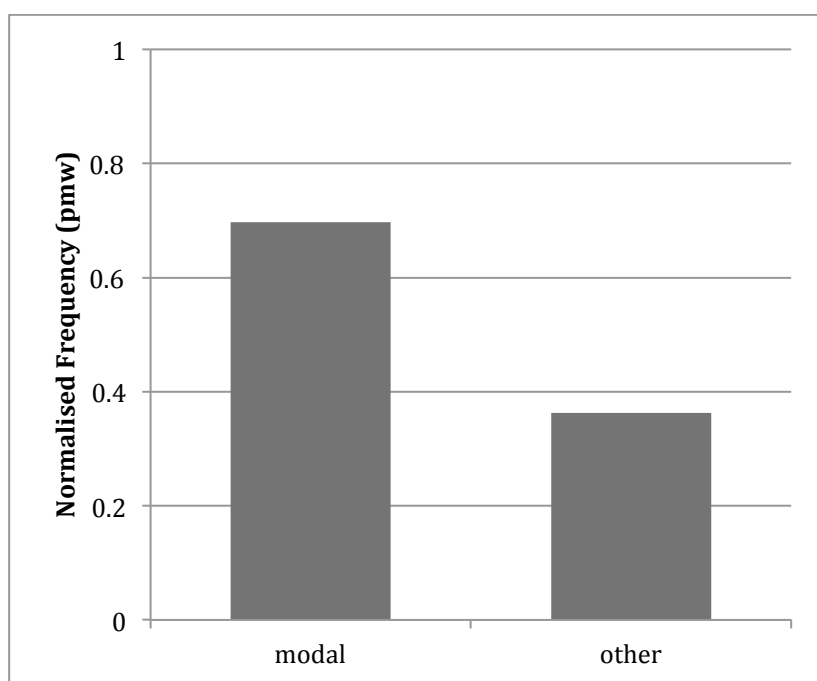
Figure 6.37. Extrapolations (pmw) for exponents of uncertainty with [commentator] + [question] + *wh*

Since there are only 30 instances of uncertainty with this meaning frame, they are presented together in Figure 6.38. Lines 1 and 2 are expressed and reported examples, respectively, of a 'low degree' modality very similar to that seen with obligation. There is little difference between *I would question whether* and *I*

question whether except that the use of *would* can be seen as a 'formal concession to the feelings of the hearer' (Kjellmer 2003: 154). It could also be argued that seems a relatively small step from *I would question whether* to *we must question whether*.

1	I'm not advocating using anabolic steroids or anything like that *but* I **would**	question whether	certain drugs should be banned.
2	If elected, Mr Dunlop, who is also a past chief executive of Commercial Union, says he **would**	question whether	the services offered by Lloyd's are efficient and cost effective .
3	*It is clear* some workers and ex-workers who do develop cancer **will**	question whether	their work with SSEB was in any way responsible .
4	*It is true that* the media have developed procedures for self-regulation to forestall all-embracing legislation, *but* many **would**	question how	effective this self-regulation has so far been .
5	Sometimes users resent the time taken from their usual work: they **may**	ask why	they should spend their time on 'computers' when they are employed to work on their application.
6	A world geared to war **was unlikely to**	question why	it should break out. It formed part of the *accustomed and natural* order .
7	*Yet* **it is inevitable that** at the present time of confusion and reform we	ask why	we should be dependent upon these two great blocks of examinations, at these two particular points in a student's school career .
8	And **didn't**, **didn't** the union	question why	they were taking money ?

Figure 6.38. Examples of expressions of uncertainty with [commentator] + [question] + *wh*

Lines 3 – 5 in Figure 6.38, meanwhile show varying levels of certainty that the question will be raised. These examples are also interesting in that, like the obligation examples discussed in the previous section, they involve reference to justifications or expectations (see italicised items in line 3) or markers of concession (*but* and *yet*). The inevitability of the questioning is explicit in line 7, an example which is close in meaning to expressions like *it is legitimate to* seen in the

previous section. Line 8, involving a negative polarity biased question, suggests that the *union* should have raised this question. In short, the distinction between obligation and uncertainty seems to become blurred with the rhetorical meaning of this meaning frame.

6.3.2.3 Indicative [commentator] + [question] *+ wh*

As noted in section 6.3.2., (positive) indicative instances of this meaning frame constitute the majority (75%). These are not strictly of interest as they are not modal. However, it is of note that 83% of these are present tense. The examples presented in lines 1 – 3 of Figure 6.39 show cases where the questioning has already taken place and is attributed to a third party, or a text of some kind (line 3). These instances are 'reported' and the writer does not seem to express agreement or otherwise with the doubt or criticism raised; these past reported instances are far more associated with QUESTION (86% of the instances).

Present tense 'questioning', meanwhile, involves the writer's direct questioning of the situation in 77% of cases, either with the first person (*I, we*) or by using *you* or *one* (lines 5 and 6).

Particularly salient markers associated with the meanings expressed are in bold typeface: a range of ways of 'biasing' a question are shown in the *wh*-clauses, and terms relating to criticism, cause and effect (*because*) and concession (*but*) occur outside the *wh*-clause. The inevitability of, or at least the reason for, the

criticism or doubt is commonly to be found in the close co-text. Line 7 represents an example of the kind of patterning related to justifying a doubt (*I wonder …* *because*) pointed out by Hunston (2002: 75).

1	They drew attention to Israel 's refusal to implement UN demands to withdraw from the occupied territories and	asked	why **no** sanctions were applied against the Israelis.
2	This claim was greeted with **scepticism** by both campaigners and foreign diplomats . They	questioned	whether the project **would** now be able to proceed.
3	The new report confirmed these **concerns**,	questioning	whether existing toxicity tests were **sufficient** to take account of these issues.
4	She has always told the truth . **But** she	asks who	is going to believe her, **when** he is an Egyptian and she is a foreigner?'
5	He is Everton blue through and through , **but if** these doubts about money continue, you	wonder if	he **'ll** stay .
6	**recalling** the swashbuckling victory in Yugoslavia that sent England to the European Championship , one	questions whether	**any** genuine progress has been made.
7	That performance against Palace worries me more than anything I have seen so far this season . I	wonder if	players are listening to the lessons **because** they are certainly not learning them.'

Figure 6.39. Instances of [commentator] + [question] + *wh*

6.3.2.4 Other examples of [commentator] + [question] + *wh*

Figure 6.40 shows some other instances which are of interest. While infrequent (0.8 hits pmw), these show the use of a causative construction (PROMPT/MAKE/CAUSE/LEAD X *to ask/question/wonder wh*) which allows explicit reference to the factor that creates the doubt or criticism. It is interesting to note

that this construction is used for questions that have already been raised as well as those that should or may be raised (*should prompt us to*; *may lead you to*). These are quite closely related to obligation expressions.

1	so the proposal that the economic organisation of a society determines its superstructure should **prompt us to**	ask	how the base itself is determined.
2	The effect is of a theatre , and the topmost gallery, which it makes every sense in a church to call 'the gods', is so close to the ceiling as to **make you**	ask	how comfortable it might be up there during mass .
3	'Withdrawal of goodwill' **cause**d many people (myself included) to	question	whether teaching could ever be viewed as a 'profession'

Figure 6.40. Examples of causative forms with [commentator] + [question] + *wh*

6.4 Conclusion

This chapter has surveyed three meaning frames related to communicating, [source] + [describe] + *wh*, [inquirer] + [ask] + *wh* and [commentator] + [question] + *wh.* The first of these is quite strongly associated with obligation, potential and volition / purpose in similar ways to 'finding out' and 'judging' instances, except that there is a higher incidence of non modal, indicative instances and in particular 'refusal to' meanings. The other two meaning frames are distinguished in terms of their association with rhetorical *wh*-questions, and are not associated with modal meaning. This may be attributed to the fact that they are question oriented verbs already. The modal associations of [commentator] + [question] + *wh* are quite

interesting since, to an extent, there is an overlap between obligation and uncertainty. The following chapter considers two 'knowing' frames involving verbs related to KNOW and CARE, respectively.

CHAPTER 7 – 'KNOWING' FRAMES

7.1 introduction

The focus in this chapter moves on to 'knowing' sequences, focusing on the patterns of use of the verbs APPRECIATE, KNOW, REALISE, RECOGNISE, SEE, UNDERSTAND, FORGET, REMEMBER CARE and MIND. In contrast to 'thinking' frames (see Chapter 5), which construe the 'thinker' as involved in some kind of mental activity, and [knowledge-seeker] + [find out] + *wh* (Chapter 4), which refer to a dynamic discovery process, instances of 'knowing' sequences focus on the state of (lack of) knowledge or the point at which realisation/understanding occurred.

The meaning frames surveyed in this chapter include nearly all of the verbs found to have a lower association with the signals of modal meaning, *to* and modal verbs (see Section 3.2 and Table 7.1). The majority of the time, instances of 'knowing' verbs with *wh*-clause complementation are not associated with markers of modal meaning. But where they are, the types of meaning they are associated with are different: there is a higher proportion of instances of uncertainty than found in earlier chapters and the meanings of *can, could* and other exponents of potential may not always apply (see Section 7.2.2).

7.2 The meaning frame [knower] + [know] + *wh*

This section will outline the decisions that led to the formulation of the meaning frame [knower] + [know] + *wh*. The bottom row of Table 7.1 indicates the verbs involved. Several of these (HEAR, SEE, FORGET, KNOW, UNDERSTAND) are listed by Leech (1987) as 'inert', that is as 'passive in meaning'. This is a subset of 'private' verbs (e.g. Biber 1988; Palmer 1990), or those typically found in 'mental' clauses (Halliday & Matthiessen 2004). The subject-referent in such cases is not actively involved in, or having conscious control of the process, with the result that these verbs tend to avoid progressive forms (Leech 1987; Halliday & Matthiessen 2004) and imperatives. However, this is not an absolute rule and, while concordance analysis suggested similarities amongst these verbs and the others listed, other categorisations have been made, as shown by the analogous groups in the literature listed in Table 7.1.

Table 7.1. Verbs of knowing in the literature

study	meaning groups	example verbs
Karttunen (1977)	verbs of retaining knowledge	*know, remember, forget*
	verbs of acquiring knowledge	*learn, notice, find out, discover*
Francis et al. (1996): V wh pattern	THINK	*appreciate, care, consider, decide, determine, forget, guess, imagine, know, mind, predict, remember, see, think, understand, wonder*
	DISCOVER	*notice, realize, recognize, (cannot) remember*
Francis et al. (1996): V wh-to-inf pattern	REMEMBER	*forget, know, realize, (cannot) remember, see, understand*
Biber et al. (1999)	Cognition verbs	*assess, consider, decide, find out, forget, guess, imagine, know, learn, predict, realize, recognize, remember, think, understand, wonder*
	Perception verbs	*see, hear, notice*
Trotta (2000)	Knowledge/Cognition	*discover, figure out, find out, know*
	Recollection	*forget, remember*
	Perception/Reflection	*consider, hear, imagine, see, wonder*
Huddleston & Pullum (2002)	Knowing	*know, find out, remember, discover*
Current study	[knower] + [know] + *wh*	*appreciate, forget, hear, know, notice, realize, recognize, remember, see, understand*

It was noted in Section 4.2 that concordance analysis of samples of SEE *wh* discerned two main senses, "find out" and "understand" (lines 2 and 3-4 of Figure 7.1, respectively). The two senses became clearer when other verbs with similar meanings are also observed, for example *check* in line 1 and *realise* in line 5. This helped in associating the meanings with other co-textual features, for example *wh-* clause types and collocates (*suddenly*). This process repeated across different

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verbs found similarities such as those observable in lines 6 - 9 in Figure 7.1. In general, with these verbs classed as [knower] + [know] + *wh* we find similar types of *wh*-clause, that is, often 'special' types such as *wh*-exclamatives in lines 4 and 5 or the declarative *how*-clause in line 9 as well as *what I mean* (lines 3 and 7). There are also high proportions of negatives and indicative instances.

1	She looked round swiftly to	check whether	the others had seen him
2	Pascoe looked around the room as though he were checking to	see whether	he'd left anything behind.
3	**A-** You see this is why I want the management committee because I don't really want to bother of interviewing somebody else and getting somebody else, do you	see what	I mean ? **B -** No, no, I understand that, but I was thinking you, to me it sound as though you sort of given her warning and [unclear] .
4	What could she say ? She suddenly	saw how	selfish she had been
5	He suddenly	realised how	close he was to her .
6	I don't	understand why	the council should act like this
7	'You	know what	I mean!' said Elise impatiently.
8	The Government do not	appreciate what	is happening in the High Street to small independent businesses
9	Then ,	remembering how	Ian had his arm round Joanna , she saw where her thoughts were leading and shook her head hastily .

Figure 7.1. Examples of 'knowing' verbs vs. 'finding out' verbs

When a language user opts to use a 'knowing' verb, it is typically to describe a situation which the 'knower' has no control over, but which simply happens; under normal circumstances, one does not, for example, order someone else to 'know' something. Having no control over a situation has been linked to a lack of agentivity (Hundt, 2004), which itself is discussed by Coates (1983) as a factor

affecting the kinds of modal meaning that are made – obligation, for example, is not

thought to be compatible with lack of agentivity since there is an expectation that

someone who is obliged to carry out an action is able to do so (Lyons 1977, Coates

1983). Huddleston & Pullum (2002) argue otherwise when discussing imperatives,

suggesting instead that they can change the meaning of the verb involved. Thus,

the observation that 'knowing *wh*' is generally construed as 'inert' in English can be

associated with the distribution of modal meanings (see Figure 7.2): obligation and

volition / purpose are comparatively less frequent than in other chapters, although

not totally absent, since the concept of 'inertness' is a gradient one. If we consider

other columns in Figure 7.2 it is also clear that, compared to more agentive

meaning frames involving 'finding out', 'judging' or 'describing' verbs, this meaning

frame has relatively higher proportions of instances involving uncertainty and, in

particular, negative instances.
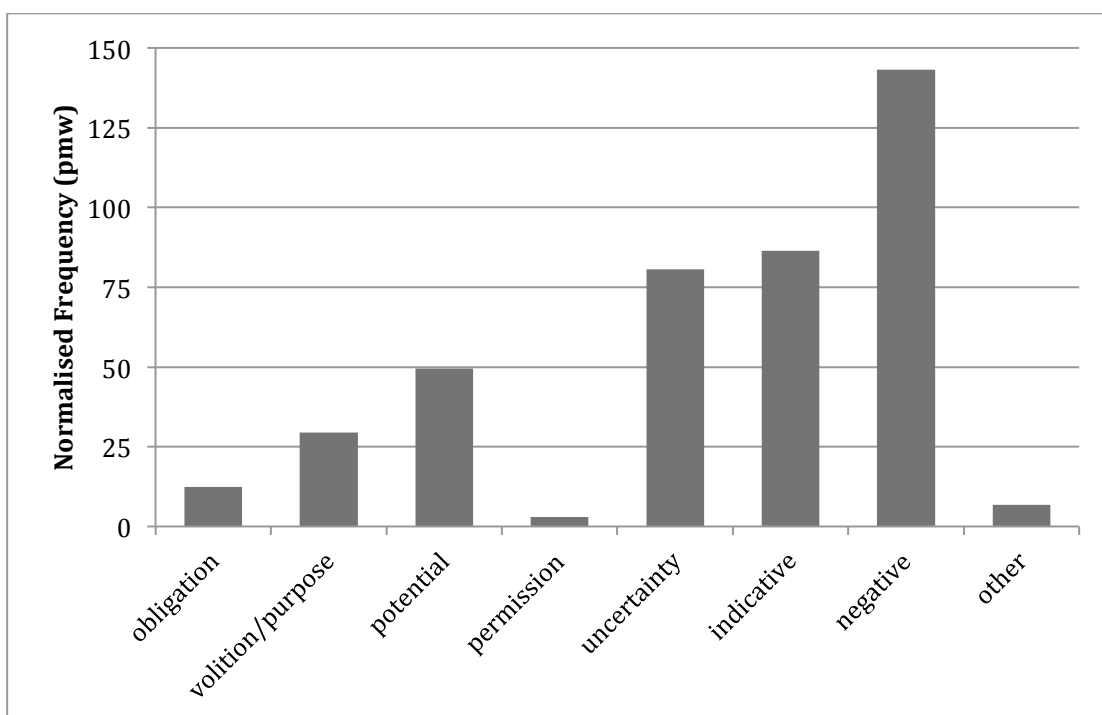
Figure 7.2. Distributions of modal and non-modal meanings for [knower] + [know] + *wh*

7.2.1 The expression of obligation with [knower] + [know] *+ wh*

Obligation is a minor meaning for 'knowing' verbs, accounting for only around 3% of instances. In a sense this is to be expected considering the 'inert' meanings that have been associated with these verbs (Leech 1987). As noted in Chapter 2, obliging an entity to do something presupposes that it has not yet been done at the time of obliging and that the entity in question is in a position to do something about it (Lyons 1977, Coates, 1983; Biber et al. 1999). It is interesting to consider the types of modal expressions that do occur with 'knowing' verbs; these types are shown in Table 7.2.

Table 7.2. Typology of expressions of obligation

Type	Main forms
imperatives, imperative-likes	imperative *you may want to*
modals	*must, should*
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*
existential	*it* BE [important] *to* *there* BE *a need to*
X ask Y to	X [ask] Y *to*
X BE asked to	X BE [asked] *to*
X's task to	*it* BE X's [task] *to*

Figure 7.3 shows the distribution of the types of modal expression for 'knowing' verbs. The extrapolated frequencies shown should be treated with some caution, mainly because of the influence of the extremely frequent KNOW; as discussed in Chapter 3, this verb is the most frequent of the **V wh** verbs in the BNC, with over 30,000 hits. This means that using extrapolations even a few instances of KNOW can inflate the frequency of a particular type. We can note, though, the relatively high proportions of semi-modals and, in particular, existential expressions of obligation with this meaning frame.
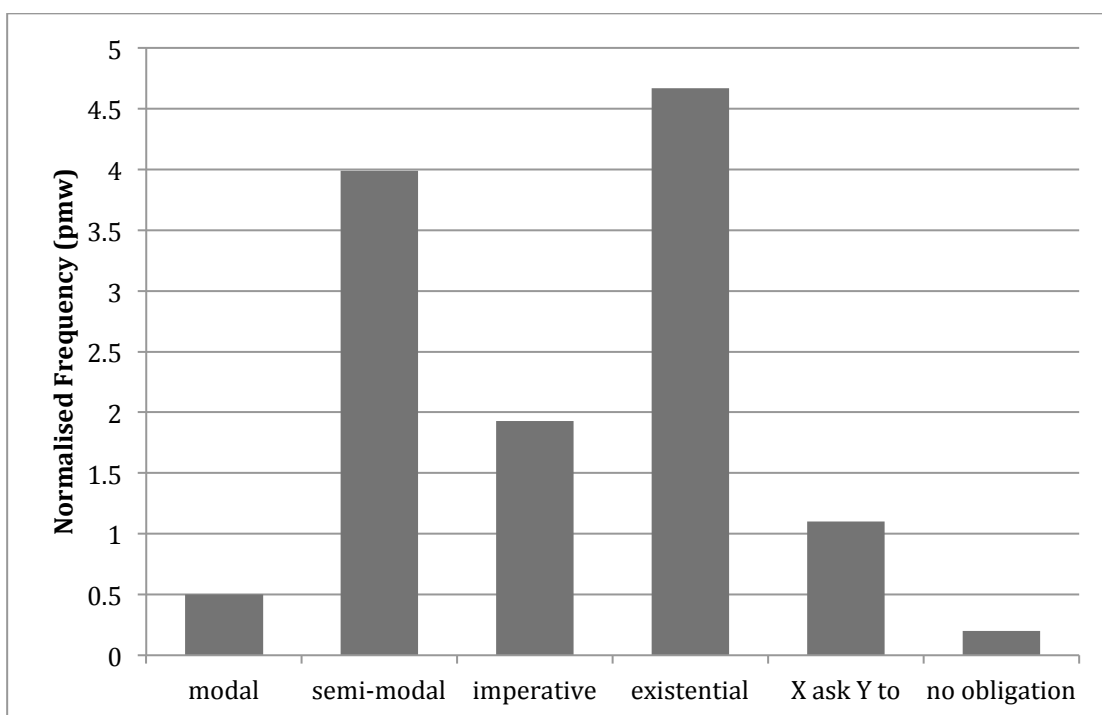
Figure 7.3. Distribution of obligation types (pmw) for [knower] + [know] + *wh*

Modals (4% of obligation instances) and semi-modals (32%) occur with a frequency of around 4.5 pmw. Instances involving the modals *must* and *should* make up 90% of modal verbs of obligation. For semi-modals, only HAVE *(got)* *to* and NEED *to* co-occur with 'knowing' instances. The examples shown in Figure 7.4 conform to the general pattern noted for the expression of obligation in earlier chapters with the difference that there are no instances of past forms of semi-modals. The higher frequency of semi-modals compared to modals indicated in Figure 7.3 reflects the fact that *know* was not found with modals.

First, second and third person subject-referents are evenly balanced across the instances. Second person *you* tends to be associated with (lists of – cf *First* in

line 3) advice or instructions and first person with 'self-exhortation' (Coates 1983) as well as 'textual' uses such as line 6, where the question (*what makes so many meetings ineffectual*) is posed so that it can be answered shortly afterwards. Even though in third person instances there is no direct addressee, the implication is that advice is being given, in line 7 by *Singh* to the *local authorities* and in line 8 by the writer to prospective managers. In the majority of cases, the need to know, which might be glossed as 'be aware', is linked to some larger goal, most obviously through the 'purpose' relation or as part of a list of instructions or advice (see italicised items).

What we can note from these examples is that in an obligation environment these verbs become more dynamic and less inert; by saying that there is an obligation to *know, notice* and so on, the speaker indicates that the obliged party has some control over this situation. Huddleston & Pullum (2002) refer to this phenomenon with reference to imperative examples, saying that in such cases the verb becomes less stative and more 'dynamic'.

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1	'Easy , Michael Holly ... you **should not**	forget who	you are. You are not one of us, you are from outside us .
2	Establishing how your work fits into debate in the area is an important function of essay-writing in literary studies; generally speaking, you **need to**	know why	and how your work matters .
3	*First* and most importantly, you **have to**	appreciate what	it feels like to lose your job and, with it, the sureness that you can feed and clothe and take care of yourself and your dependants in the way you're used to .
4	Most certainly, though, we **should**	appreciate how	fortunate we are in having medical services, caring people around us, and living in a country where natural disasters are rare compared with many places on this earth .
5	Undoubtedly there is humour here, but however much we laugh we **must not**	forget what	is at stake, nor fail to appreciate the danger into which Abraham has brought not only Sarah , but the grand purposes of God.
6	If meetings are potentially so useful, then why do so many go wrong? *In order to* answer this we **need to**	understand what	makes so many meetings ineffectual and time-wasting, and to formulate means by which the meetings you attend can be as productive as possible .
7	Singh says local authorities **must**	understand why	the black community is missing out and 'recognise and understand the existence and manifestations of racism' before they can talk to users effectively .
8	If there are noticeably poor performers in the task of co-operation, the manager **has to**	notice which	form of inadequacy is revealed .

Figure 7.4. Modals and semi-modals of obligation with [knower] + [know] + *wh*

Imperative instances of 'knowing' verbs have a frequency of around 1.9 pmw; *notice* is the 'knowing' verb most associated with this use (around 7% of its instances). We can note that instances are very similar to instances of second person modals and semi-modals with the same verbs (see Figure 7.5). These invariably involve advice or instructions that will help the addressee and almost invariably occur in lists with other imperatives or another expression of obligation (lines 1 and 3). Instances with *remember* and *don't forget* (lines 5 and 6) –

representing around 27% of imperative instances - represent exceptions to this generalisation, with the implication of threat or warning if an effort is not made to do so. A further point worth mentioning is the interpretation of *wh*-clauses, in particular potential embedded exclamative clauses. In lines 1, 3 and 4 the *wh*-clauses have a potential exclamative reading, in particular line 1, which more neutrally would read *realise how you feel.* In each case the *wh*-clause chosen in some way biases the answer, narrowing the possible answers that can be given and implying that in 1 you will feel good and in 3 you use too much salt.

1	**Repeat** all today's exercises (excluding the aerobics), holding each position for 2 counts.	Realise how	good you feel as you do them .
2	You say, OK, this is it, put it all away, because **I've got to** cope, **I've got to** survive in this life [unclear], so	know what	your stress points are and act on them .
3	If you sprinkle salt over every meal , **stop** it !	Notice how	much salt you use, and **start** trying to live without it .
4	And it didn't help to have that idiot Kegan see what he bad done and try to extricate him .	Remember what	you're here for, he told himself and turned back to his audience .
5	And birds don't feel like flying,' Candy snorted inelegantly. 'Don't	forget who	you're talking to here -- I 've known you a long time , remember ?

Figure 7.5. Imperative examples of [knower] + [know] + *wh*

The only other type of obligation expression with more than two instances in the sample is existential expressions of obligation, which were found in the concordances of almost all of the 'knowing' verbs (in particular RECOGNIZE; nearly 7% of **V wh** instances of this verb) and have a frequency of around 4.6 pmw. This

type of expression simply states that an obligation exists or existed; examples are shown in Figure 7.6.

As with other meaning frames where these types of expression have been found, the clearest examples here of the form *it* BE [important] *to/that*. All but three of these instances involve either *important* or *necessary*: the other adjectives are *essential, worth* and *best*. Only one instance, of *necessary that*, involves a *that*-clause. The majority (around 82%) of these are present tense, although reported past forms are found (see line 4). Line 1 is interesting in that it is a report which is identified as *advice* but it would still seem to act as advice itself. However, more than twice as many of the instances identified are 'textual' examples similar to lines 2 and 3 where *it is necessary/important to* is used as a rhetorical device to help draw attention to a particular point and build an argument (Van linden 2012). Apart from *it* BE [important] *to*, we can note the nominal form *the importance of*, also noted by Hunston (2011), as well as *it helps to* in line 5. The obligation interpretation of this instance is supported by co-textual evidence in that *if you are to …* is one example of a subordinate clause associated with sentences where suggestions are made. The final line in Figure 7.6 shows an instance of *the only way to ... is to*; variations of which include *the trick is to* and *one important task is to*; these account for around a quarter of existential expressions.

1	But I have never forgotten advice that my research adviser gave me the first time that I was pursuing a dead end: '**It is important to**	recognise when	to quit.'
2	**To understand** this remark **it is necessary to**	appreciate how	radically Wittgenstein's conception of language, in the Investigations and Zettel, differs from that of John Locke .
3	But **it is important to**	notice how	the idea of the family at this time often stretched beyond the normal three generations of direct descent .
4	she knew **it was important t**o	understand what	was being said to her ; but still she felt leaden .
5	If you are to enjoy the satisfaction of growing one, clearly **it helps to**	know how	to combat all the pests and diseases that conspire to stop you .
6	Such questions point up **the importance of**	recognizing how	the reality principles of power are reworked 'intra-discursively'.
7	**The only way to** reach an informed decision **is to**	understand what	the menopause entails and exactly how HRT works .

Figure 7.6. Examples of existential expressions of obligation with [knower] + [know] + *wh*

It is to be expected that expressions of obligation are relatively infrequent with 'knowing' verbs. However, where they do occur, they have similar functions to those found with other meaning frames. It is perhaps more telling to note which types of expression do **not** occur – there are no instances of imperative-like requests, very few of reported requests, that is X [ask] Y *to* and X be [asked] *to* or those that state that the knower's task or job is to 'know' the answer to a question. These types of expression could be seen as making the knower's control over their knowing explicit in a way that the expressions found here do not.

7.2.2 The estimation of potential with [knower] + [know] + *wh*

This section presents a survey of expressions referring to potential that qualify the [knower] + [know] + *wh* meaning frame. The different realizations of potential introduced in Section 2.4.3 are shown in Table 7.3. They extend beyond modal verbs and semi-modal BE *able to* to existential expressions of potential and 'enabling' expressions.

Table 7.3. Typology of expressions of potential

type	main forms
modal	*can, could*
able/ability	(BE) [able] *to* *have* [ability] *to*
existential	*it* BE [difficult] *to* [way] *to/of*
enabling	X [enable] Y (*to*)

Figure 7.7 shows the distribution of exponents of potential with 'knowing' instances. These figures are approximations as they are based on extrapolations from the sample and so can only show general trends. The general trend for modal verbs to be the most frequent means of referring to potential and for negative modals to be more frequently attested continues here; reference to ability or inability of the subject referent ('able / ability' and 'unable/inability') is relatively infrequently found. Existential expressions, in particular introductory *it* expressions referring to difficulty ('difficult') are well represented; expressions referring to *enabling* also vastly

outnumber *preventing* ones.
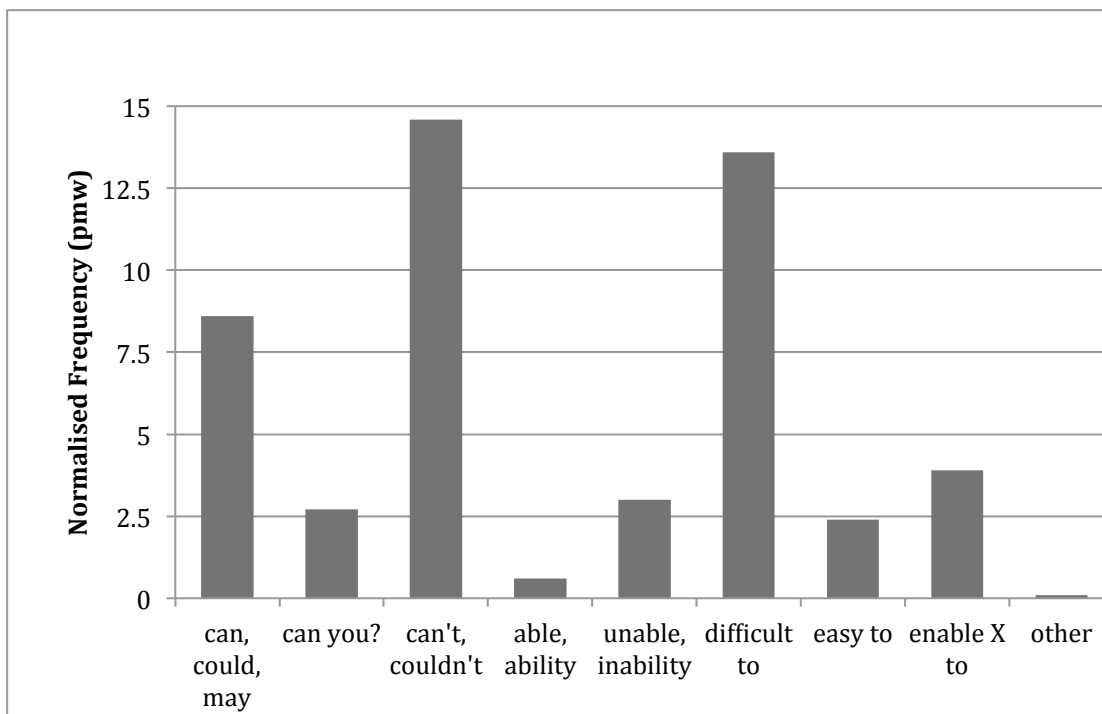
Figure 7.7. Distribution of expressions of potential with [knower] + [know] + *wh*

Figure 7.8 shows 'knowing' instances with *can / could (not/n't)*; there is just one instance of potential *may*. As with other meaning frames, negative instances outnumber positive ones (14.6 hits pmw vs. 8.6 hits pmw) due to the greater frequency of negative *could*. The 'knowing' verbs most associated with modals of potential are APPRECIATE (10% of APPRECIATE *wh* instances), SEE (7%), UNDERSTAND (21%) and REMEMBER (39%). While verbs with meanings close to *understand* (UNDERSTAND, SEE, APPRECIATE) appear in both positive and negative environments, *remember* is predominantly negative or interrogative; both *forget* (2.2% of **V wh**

instances) and *know* (0.4%) occur only rarely with modals of potential. A weakening of the meaning of *can / could* is often noted with these verbs and this is associated with their lack of agentivity, or 'inertness' (Johannesson 1976, Coates 1983, Leech 1987, Palmer 1990, Kjellmer 2003, Collins 2009). Leech (1987: 74) argues that '*I can remember* scarcely differs from *I remember* as a means of referring to a state of recall', although Palmer (1990: 87) finds 'some sense of ability or possibility' in similar situations. This does not, however, explain why *can* or *could* might be used here.

It has already been noted with reference to verbs such as IMAGINE (see Section 5.3.2) that such apparently 'exceptional' uses of *can* are particularly associated with particular co-textual features. Both Hunston (2000) and Kjellmer (2003) note the interactive nature of similar instances – Kjellmer (2003: 146) suggests that the use of *can* marks 'speaker attitude to the hearer or proposition'. This is evident from the fact that around 75% of instances in general are first or second person, a figure that rises to above 92% with *can*. This feature is associated with the 'special' types of *wh*-clause that are seen: embedded exclamatives (lines 1 and 4), rhetorical *wh*-clauses (lines 5 and 6) and *how*-declarative clauses (line 2). In these cases, the information gap in relation to *wh*-clauses (Quirk et al. 1985) is greatly narrowed; the 'answer' is obvious. This suggests why, in the context of **V wh** instances, the meaning of *can* is 'weakened' or 'low degree' (Huddleston & Pullum 2002) – if the answer is obvious, then one's 'ability' to understand or remember it is moot. Instead, the function of such

instances seems to be to draw attention to the information so that it can be evaluated in some way: it may be memorable for personal reasons (lines 1, 2); justified (line 3); against all expectation/comprehension (lines 5 and 6); positive / negative (lines 4 and 7).

In terms of interrogatives with *can*, these occur around 2.7 times pmw; the verb most associated with interrogative instances is REMEMBER (7% of its **V wh** instances), which is more likely to represent a genuine question (line 8). In contrast, examples with other verbs (line 7) are more likely to be rhetorical – note the negative polarity biased question *can't you remember*.

1	This time I decided to have my coffee in a little cafe not far from SIS. I **can** still	remember how	good that coffee tasted , and how different it tasted from the common-room coffee I was used to .
2	Walter Jones, December 1966 I **can** never	forget how	he used to come over in the evening from Bembridge School to sit with me after my son died of tuberculosis
3	I **can**	understand why	he did it, to be quite honest .
4	You **could** easily	forget how	good tracks like 'Achilles' Last Stand' from the 1976 album 'Presence' or 'Ramble On' from 'Led Zeppelin II' were, but their inclusion here drives home the point that they are absolute classics .
5	I can only think they are a dumping ground for psychotics and maniacs. I **can't**	see how	they achieve **anything** .
6	Ian Wright is a player who can always guarantee goals. I **couldn't**	understand why	he was **not** in the European Championship squad.'
7	**Can't** you	understand how	it riled me ?
8	'I see . **Can** you	remember who	was standing with Livesey , when you left?' Forrest pondered .

Figure 7.8. Modal verbs of potential with [knower] + [know] + *wh*

We have noted in earlier chapters the range of expressions available to refer to the ability of the subject referent, either using adjectival expressions such as X BE [able] *to* or nominal expressions involving *ability* or *difficulty*. Examples are provided in Figure 7.9. The verb most associated with these expressions is RECOGNIZE (10% of instances). X BE [able] *to* is the most frequent expression, with around 2 hits pmw. Other, less frequent expressions are *Adj enough to / too Adj to* (line 4), with 0.7 hits pmw and X FIND *it hard/difficult to* (line 6; 0.4 hits pmw); BE *capable of* and other adjectival expressions such as BE *good at, not* BE *in a state to* and BE *well equipped to* were all found less frequently. Nominal expressions are HAVE *difficulty in* (0.18 hits pmw; line 7) and (HAVE) [ability] *to* (0.17 hits pmw), which, as line 3 indicates, may include other nouns (*courage* and *wisdom* are also attested).

What is noticeable in terms of this meaning frame is that the positive instances (lines 1-4) tend to involve genuine questions, with line 4 an exception in that it involves a declarative-*how* clause. Negative instances with 'understanding' verbs, in contrast, almost invariably express incredulity and involve rhetorical embedded questions (lines 5 and 6) marked by features such as those italicised in lines 5 and 6.

1	After this seminar, participants **will be able to:**…	Appreciate how	individual products relate to each other .
2	Part of the process of analysing discourse in terms of 'topic' is an attempt to make explicit the basis for **our intuitive ability to**	recognise why	what is said is appropriate in a particular discourse fragment .
3	This involves a very considerable degree of planning and administrative skill together with **sufficient maturity** at both local and national level **to**	recognise what	can be devolved and what should be maintained as a national concern .
4	Long before . She had been nineteen when her mother died, **old enough to**	notice how	poor old Pa seemed to shrink inside himself at the time.
5	Pat was bewildered, **unable to**	understand why	Eileen *could not* wait to be married from home
6	The England manager hit back in the row with his former captain and said : '**I find it hard to**	understand how	*any* player can retire from international football at the age of 30.
7	While people like Klein recalled events thirty years old in crystalline detail, Gentle **had difficulty**	remembering where	he was and with whom even ten years before .

Figure 7.9. 'Able / ability' type potential expressions with [knower] + [know] + *wh*

As shown in Figure 7.7, existential potential expressions also co-occur frequently with 'knowing' verbs (32% of all potential instances); those that emphasise the difficulty, rather than the ease, of understanding or remembering are far more frequent (13.5 compared to 2.4 hits pmw). The verbs most associated with these existential, or generalised expressions of potential are verbs with similar meanings to 'understand': APPRECIATE (6.5% of appreciate *wh* instances co-occur with these expressions), SEE (6.5%) and UNDERSTAND (5.3%).

As noted with all previous meaning frames, the most prevalent phraseology (just under 12 hits pmw) is *it* BE [difficult] *to* with adjectives expressing different degrees of difficulty: *hard* (33% of instances)*, easy* (18%)*, (im)possible* (14%) and

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difficult (35%). We can note a number of other expressions only occurring once – *not need much imagination to* and *it takes more perception to*.

Lines 1-2 in Figure 7.10 demonstrate the typical use of *it* BE [easy] *to* [understand] *wh*, which is very similar to that of *you/one/I can understand wh*. The speaker suggests that the evidence which makes it easy to understand – all the verbs bar one example of *forget* are 'understanding' verbs – is readily available or points it out (note *so* in line 2). These instances are thus rhetorical in the sense that the speaker already knows the answer and implies that the hearer should do as well. With 'difficult' instances (lines 3 and 4), understanding verbs, the implication is either that of disbelief or surprise (where modal verbs such as *could* in line 3) or that the information is extreme where exclamative clauses (line 4) occur. Clearly, not all instances will be rhetorical; those with other verbs such as *know, forget* (line 5) involve genuine questions. In terms of nominal expressions, the main exponent found here is the phraseology based around *way to/of* exemplified by lines 6 and 7 (2.4 hits pmw), which also includes instances of *technique/mechanism for* and *means to*.

1	**It is not hard to**	understand why	Mr Major , scoffing at coalitions and PR , chose to highlight Brussels rather than Bonn.
2	*So* **it is not difficult to**	see how	TB could spread from badger to cow.
3	Recalling the images and themes of the '70s - especially the late '70s - **it is difficult** fully **to**	appreciate how	*bad* things actually were.
4	The triumph and the achievement were Capitalism's. **It is difficult to**	see how	at that point in history it *could* have been otherwise .
5	*since* his oddly lengthened features were incapable of displaying an emotion which would be understandable to other humans, **it was impossible to**	know what	he was thinking .
6	A simple **way to**	appreciate what	it means is to visualise the Spectra line being passed down a hollow tube (the 'sleeve') until it appears at the other end .
7	Last night's lesson had been taught blind, **there was no way of**	knowing how	many had survived to get it by heart .

Figure 7.10. Existential expressions of potential with [knower] + [know] + *wh*

Instances in Figure 7.11 involve examples of 'enabling' instances with 'knowing' verbs, those in which someone (novice, pupil or other person without knowledge) is being *helped*, *guided*, *taught* or *led* to a greater understanding. The verbs most associated with this type of expression are APPRECIATE (6.5% of its instances) and RECOGNIZE (8%)[1]. With an overall frequency of around 3.9 hits pmw, this is not a prevalent way of expressing potential with this meaning frame (under 8% of all instances). The majority of instances (86%) involve the phraseology X [enable] Y *(to)*, almost exclusively with the verbs ENABLE (62% of cases) and HELP (36%), although TEACH (line 5), GUIDE, ASSIST and TRAIN were also noted in the

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[1] RECOGNIZE is also the only verb to co-occur with the associated LEARN *to*; all of these (6) instances involve LEARN in modal environments (with modal verbs, in the imperative or in an *if*-conditional clause).

concordance lines (see line 5), indicating the tendency of 'enabling' in this meaning frame to be associated with education and learning, which is particularly noticeable in lines 1, 5 and 6, which all contain items related to education. The other 'enabling' expressions seen in lines 4 and 6, MAKE *it* [easy] *to* and GIVE/PROVIDE X *(with) the opportunity/means to/for* in line 6 are both minority expressions with this meaning frame (0.03 and 0.5 hits pmw, respectively).

1	Awareness of these uses **should help** *pupils* to respond to texts with greater understanding , to	recognise when	language is being used manipulatively
2	The use of Colour Index Generic Names, **enables us to**	know which	pigments are being used in each paint .
3	The cost of litigation is high . This leaflet is **designed to help** you	understand what	you can be asked to pay and when.
4	Representing the individual as a series of interpenetrating planes of increasing fineness and subtlety **makes it easier to**	appreciate how	changes on any one plane can affect the others .
5	Head teacher Sheila Davies commented: 'As a church school we **teach the children to**	appreciate what	they have, and point out there are a lot of people in the world who are worse off.
6	It is useful for these trials to cover quite a wide range of *classes* […] to **give** the *teacher and observers* **the opportunity to**	see how	effective their use of the unit becomes with experience.

Figure 7.11. Examples of 'enabling' expressions with 'knowing' verbs

7.2.3 The expression of volition and purpose with [knower] + [know] + *wh*

Instances of volition / purpose with 'knowing' verbs are relatively infrequent at around 7% of the total. This may be associated with the generally inert or stative

meaning of these verbs (Leech 1987) noted in Section 7.2, which makes them less likely to occur with expressions of volition or purpose, which are more associated with dynamic meanings (Coates 1983). Thus, where these verbs do occur with expressions of volition or purpose, a more 'active' or 'dynamic' meaning results.

The different means of expressing volition and purpose are shown in Table 7.4. apart from modals and semi-modals we have adjectival BE [prepared] *to,* verbs of volition/intention with *to*-infinitive complementation and nominal [aim] BE *to*. The alternatives to modal verbs (including semi-modal BE *going to*) tend to express lower levels of commitment to carrying out the 'describing' (here). 'Trying' expressions and purpose clauses refer to goal-directed action.

Table 7.4. Categories of volition/purpose

Type	Main forms
modals, semi-modals	*will, would,* BE *going to*
be willing to	(BE) [willing] *to*
wanting	[want] *to* [aim] *to*
aim be to	[aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose	*(in order) to*

The extrapolated frequencies of these different types with [knower] + [know] + *wh*

are shown in Figure 7.12. It is clear that instances of 'wanting' verbs – verbs of volition and intention with *to*-infinitive complements – are far more frequent than the other types. This is largely due to the prevalence of WANT *to know wh*. The fact that KNOW occurs so much more frequently with *wh*-clauses than any other verb means that frequency estimates based on extrapolations of the number of instances found in the sample become very inflated where there are a number of occurrences of this verb. A good example of this can be seen with the 'prepared to' column in Figure 7.12 which is extrapolated from only 4 raw instances in the sample, 3 of which include *know*.
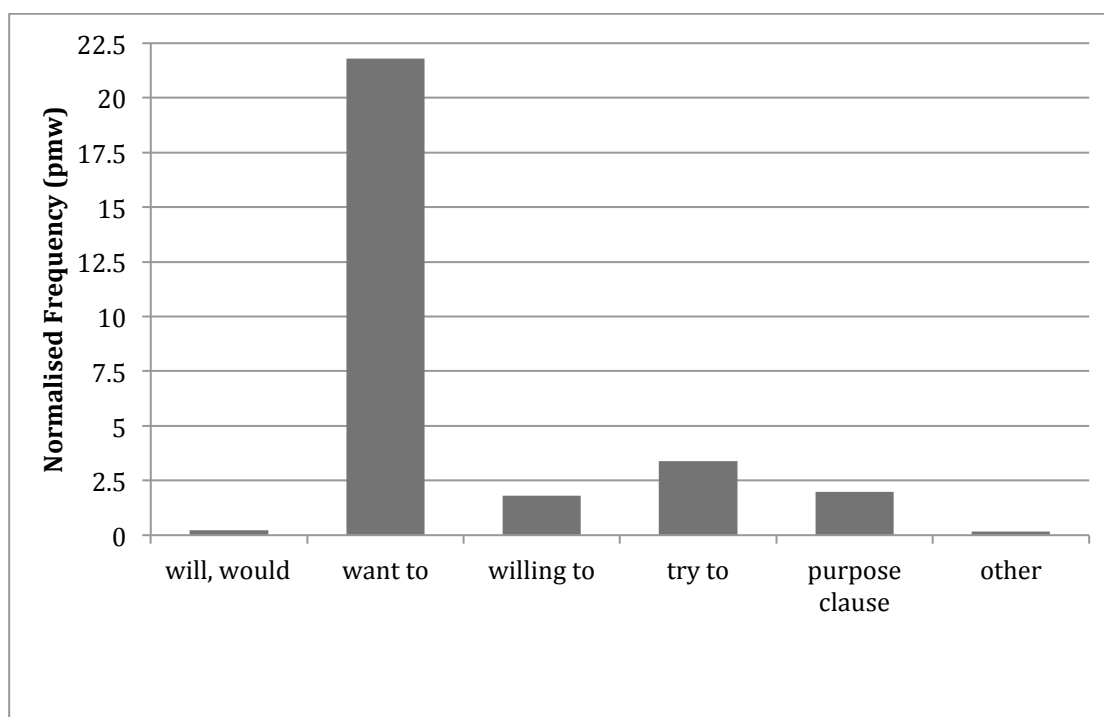
Figure 7.12. Distributions of volition/purpose expressions with [knower] + [know] + *wh*

Figure 7.13 provides examples of *will* and *shall* with volition meaning with 'knowing' verbs. These are very infrequent (0.2 hits pmw); in fact, only instances of *will/shall* with *forget* and *remember* were interpreted with this meaning. All but one of these are first person and, as the examples show, constitute a commitment on the part of the speaker to remember a specific incident by making a conscious effort. The types of *wh*-clause are almost all *wh*-exclamatives or *how*-declaratives (see line 1).

| 1 | I feel as badly as you do, but we don't have time for this. If we ever get out of here you can be damn sure I **won't** | forget how | he saved our lives .] Paige brushed her tears away with a careless hand . |
| 2 | I won't remember it , thought Fenella, leaning her flushed cheek against the cold window. I**'ll** | remember how | he looked at me just before the Robemaker took him and how he called me 'Lady'. |

Figure 7.13. Examples of volition *will* with [knower] + [know] + *wh*

While modals of volition are infrequent with 'knowing' verbs, 'wanting' verbs are far more frequent than any other type of volition expression with this meaning frame, at 21.8 hits pmw. This is largely because of the association with KNOW; 7% of the instances of this verb are with 'wanting' verbs.

Nearly 80% of instances involve WANT *to*, invariably with *know wh* or *understand wh* (see Figure 7.14). There are only a few (1% of the extrapolated total) instances of SEEK *to*, all of which are with *understand wh*. Line 10 is provided as an example – the only one in this meaning group where reference is made to research. Apart from this one exception, WANT to *know / understand wh* instances report a person's or a group's curiosity or desire for knowledge/understanding. Two

main uses can be discerned. The first of these merely reports the desire for knowledge or understanding; these involve all instances of understanding and some others (around 15% of the total). In contrast, the second use is where the wanting to know either represents an indirect request for information, as in line 1 (where *I want to know where you* is effectively the same as *where did you...?*) or a reported question, as in line 2, which is the report of *Col. Dabson's* question. The distinction between the two uses is clearest where there is a personal pronoun representing the addressee (these are italicised in the examples) but there is a degree of blurring between the two uses. Instances with more the 'forceful' DEMAND *to* (line 4) and CLAMOUR *to* (line 5) provide a minority pattern (15% of instances) and are exclusively third person.

1	No, I **want to**	know where	*you* got them from .
2	Col. Dabson **wanted to**	know why	so much money was to be spent on open spaces such as Radford Park and the recreation ground .
3	'The book is so appealing that my pupils constantly **want to**	know what	comes next.'
4	'The fact that you 'll be among your old friends , who will all **clamour to**	know where	*you*'ve been.'
5	Mr Jones grabbed her and shook her, **demanding to**	know where	*she* had been
6	What they **want** more than anything else is to	understand why	this has happened to them . And some of them will go to extraordinary lengths to try to find out .
7	In particular , I **wanted to**	understand why	we find meat so incredibly important .
8	The aim of this research project is to study modern food habits [...]. It will **seek to**	understand how	people are influenced by ideas of 'healthy' eating, and how such ideas are translated into practice .

Figure 7.14. Examples of 'wanting' verbs with [knower] + [know] + *wh*

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Expressions related to purpose, 'trying' and purpose clauses, have a close affinity with those of volition, with the main distinction being that they imply goal-directed action. This is particularly clear where TRY occurs in the *-ing* form, indicating a degree of effort in progress; around 60% of instances with this meaning frame are of this sort. Since 'knowing' verbs are commonly noted to be stative – it is unusual to 'try' to know something – it is not surprising that there are relatively few instances of TRY *to* here (around 1.8 hits pmw). The only 'knowing' verbs to occur more than once are *remember* and *understand*, both of which freely occur with *trying to* and *tried to* (see Figure 7.15). There is one instance of *recognise*, which incidentally is the only instance of ATTEMPT *to*; all other instances involve TRY *to*.

Once again, co-occurrence with an expression of volition/purpose can be argued to influence the sense of the verb. In TRY *to remember wh*, as with expressions of *potential* with this verb, *remember* is more like 'bring to mind' (recall) than 'have as a memory in one's mind', the definitions for senses 3 and 1 of REMEMBER in CCED, respectively. This meaning is quite clear in line 1, where the subsequent question shows the subject referent's attempt to remember as well as their lack of certainty. With instances of TRY to *understand wh,* meanwhile, the meaning of this verb is very close to *work/figure out wh*, verbs which also frequently co-occur with TRY. A further point of interest is that REMEMBER and UNDERSTAND are the 'knowing' verbs that occur with *cannot / can't* most frequently in the sample; the association in terms of meaning between TRY *to* and meanings of *difficulty* has been noted in Hunston (2011) and is particularly clear in instances

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such as line 5.

1	Georgina's generation were much luckier. He **tried to**	remember which	school she had been sent to: Haileybury, was it?
2	Skates were tied on the wrong feet; some boys **were trying to**	remember when	they had last changed their socks; the smell was incredible.
3	They have taken a long hard look at the way Japanese firms operate and **tried to**	understand what	it is that makes them so much more productive and successful.
4	Or should one take a middle road, **trying to**	understand what	goes wrong and then deciding whether it is easier to prevent or to cure?
5	Then it turned out to be rather unusually abundant and erm we now have the **problem of trying** to	understand why	it's there in the first place.

Figure 7.15. Examples of 'trying' instances with [knower] + [know] + *wh*

Purpose clauses are also relatively infrequent with this meaning frame; they occur just under 2 times pmw. The only verbs found more than two instances are UNDERSTAND (6% of its **V wh** instances) and APPRECIATE (5%). In general, as the examples in Figure 7.16 show, *understanding* or *appreciating wh* is presented as depending on observation and examination (lines 1, 2, 5 and 6; around 72% of cases) or other ways of obtaining information / knowledge (lines 3 and 4; 26% of cases). It is also interesting to note that in around 80% of instances the main clause indicates that this process is seen as in some way necessary; a range of expressions of *obligation* are found (in bold). Around half of the instances are of the 'textual' kind (Van linden 2012), where the expression of obligation (e.g. *we must delve* in line 3) is a rhetorical device to advance the present argument in a piece of writing; other examples are lines 1, 2 and 6.

1	In order to	appreciate how	this tension determines the pattern of interests theories, **we must first examine** the web of economic relations in an advanced capitalist society .
2	To	appreciate how	a falling price level serves to stimulate employment, **consider** Figure 8.7.
3	Again we **must delve** back in history to	understand how	we got to this position .
4	Perhaps the hon. Lady **should go for a tutorial** with him to	understand how	VAT is collected.
5	To	understand what	an ocean is, **it is far more helpful to see** one rather than just read about oceans
6	To	understand why	this is so we **need to return to** the polytrauma theory outlined earlier and see what its significance is for the development of the modern individual .

Figure 7.16. Examples of purpose clauses with [knower] + [know] + *wh*

In summary, volition / purpose are not meanings that are particularly compatible with 'knowing'. For this reason, where they do occur together, certain effects are seen. One example is that the verb 'know' occurs in a relatively fixed expression such as 'WANT *to know wh*' which usually means 'ask'. Another is the example of REMEMBER, which takes on a more active meaning ("call to mind"). Finally, UNDERSTAND seems to be used in more formal, rhetorical contexts such as those seen in Figure 7.16.

7.2.4 The expression of uncertainty with [knower] + [know] + *wh*

With 'knowing' verbs, the expression of uncertainty is far more frequent than it is for any other meaning frames (nearly 20% of all instances). This relative prominence

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of uncertainty is in line with Coates's (1983: 181) finding of an association between epistemic modal meaning and stative verbs. This section allows for a fuller consideration of the ways in which modal realizations other than modal verbs may be involved in expressing uncertainty and reporting the uncertainty of others. These other realizations are shown in Table 7.5.

Table 7.5. The main means of expressing uncertainty

Type	Main forms
modals, semi-modals	*will, would, may, might, must, should*
adverbs	*probably, perhaps*
projection	[think] (that)
conditional	*if, unless*
***yes-no* question**	*Have you …?*

If we consider the estimated distributions of these means of showing uncertainty with this meaning frame, we can note the relative prominence of (*yes-no*) questions, more frequent even than modal verbs (see Figure 7.17). There are also significant numbers of conditional clauses and mental predicates with *that*-clauses (labelled 'think that'). The other columns in Figure 7.17 show lower frequency 'know if', which includes **V wh** verbs with *whether/if*-clauses, modal adverbs such as *perhaps*, and SEEM *to.*
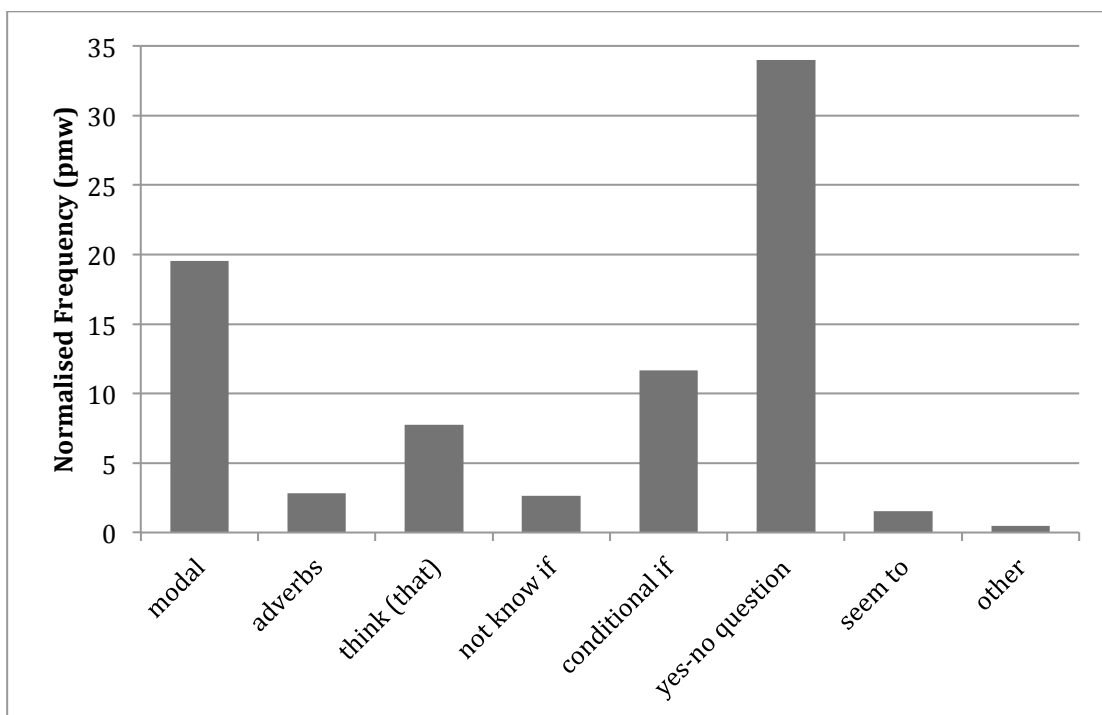
Figure 7.17. Distributions of exponents of uncertainty with [knower] + [know] + *wh*

The following will discuss the realisations of uncertainty in the order they are presented in Figure 7.17.

The frequency of instances of modal verbs of uncertainty with 'knowing' instances is around 19.5 pmw. The 'knowing' verbs most associated with modals of uncertainty are *appreciate* (10% of APPRECIATE *wh* instances), *know* (5.5%), *realize* (5.5%) and *forget* (5%). Although all the modals are represented, as the examples indicate, those expressing a high level of certainty make up the majority; 75% of instances involve either *will* (42.5%), *would* (26.5%) or *must* (6%).

The examples provided in Figure 7.18 indicate the range of co-occurrence features with these uncertainty modals which are suggestive of phraseologies with

preferences for particular verbs. Lines 1 and 4 (and, arguably, line 6) show that a specific group of people (those with short memories, or *those/anyone who/with ...*) may be identified as likely to *know, realise* or *forget wh* (FORGET is particularly associated with perfect uses, which only account for 2.5% of the total); around 11% of modal instances are of this type.

Line 3 shows another relatively common usage (around 14% of instances) involving reference to a particular circumstances introduced by a *when* or *if*-clause; this usage is associated with 'noticing' verbs (*notice, appreciate, recognise, realise*). Line 5 exemplifies 'pure predictability' (Coates 1983), in that the speaker predicts that the (human) subject referent *will/would know* the answer (23% of instances; only *know* is found). Line 7 appears similar in making a prediction of others, but also includes a time adverbial (noted in around 10% of instances; also *soon, immediately, instantly, now*).

Harmonic expressions of uncertainty (Coates 1983) such as *thought* (*that*) in Line 8 and also those indicated in italics in lines 4 and 6 are found in over 27% of modal verb instances. Line 9 shows how modals of uncertainty can cluster together (*can* appears in the previous sentence). Line 10 indicates how certain features can come together; the first clause of the sentence provides the reason why the noticing was unlikely, while the second involves a conditional clause. It is also worth noting the relatively high proportion of *wh*-exclamatives (seen in lines 3, 4, 6, and 10) as well as declarative-*how* (lines 1 and 2) with 'noticing' verbs (47% of instances) and FORGET (35%).

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1	Only the shortest of memories **will have**	forgotten how	declining Western industries successfully sought tariff and quota protection to counter the greater efficiency of Far Eastern competitors.
2	You **must have**	noticed how	most people see change as a threat, something to deny.
3	*When you consider* how much that extra amount can achieve, you **will**	appreciate how	valuable your Covenant can be .
4	I *should have thought anyone with* a grain of sensitivity **would**	realise how	painful it is for all of us to have this all raked up again .
5	We'll phone Joey, he**'ll**	know what	to do .
6	*It is to be hoped that* schools in the independent sector **will**	recognise how	vital these principles are if we are to promote true peace and co-operation in British society .
7	Loretta cried, sensing the implied criticism in his tone. 'They**'ll** *never*	understand why	I didn't go to them in the first place.
8	She *hadn't thought* she **would**	understand what	Fand meant; but after only a moment the sense came to her that she was looking at a prisoner
9	Manifestations *can* vary enormously from one individual to another; a sufferer **may** -- or **may not** --	forget how	to wash, dress, eat, go to the lavatory, get up or go to bed
10	*The light was poor* in the Collector's bedroom and Fleury **might not have**	noticed how	red and swollen his face was, *had* the Collector *not* presently fallen sideways, rapping his head on the floor.

Figure 7.18. Modals of uncertainty with [knower] + [know] + *wh*

Modal adverbs of uncertainty are found infrequently in this study, a pattern that continues for 'knowing' instances; a raw count of 19 instances extrapolates to around 2.8 pmw. Figure 7.19 provides some examples. These adverbs are relatively evenly split (43% to 54%[1]) between 'evidential' adverbs (*presumably, apparently, obviously*), which suggest an inference is based on evidence (lines 1 and 2), and adverbs indicating a judgement of likelihood (*probably, perhaps* and *no*

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[1] There is also one instance of (*not*) *necessarily* which does not really fit with either group and which explains why the percentages do not add up to 100.

doubt). The evidence may lead to a lower (*presumably*) or higher (*obviously*) degree of certainty. Hoye (1997) notes that these evidential adverbs collocate with *must*, which Palmer (1990: 12) also links with 'judgement upon the evidence available'. Of the 'knowing' verbs, REALIZE has the strongest association with these adverbs, but this is still small (2% of instances of this verb).

1	it turned out the Indian had started this long conversation with him before we could possibly have had the accident. So they **presumably**	knew what	was going to happen .
2	Really?' she said coldly. He **obviously**	realized how	that sounded
3	I'm not half so keen as she is -- she 's absolutely dedicated. You've **probably**	noticed how	she spends every spare minute practising her putting .
4	**Perhaps** they didn't	understand what	I meant.

Figure 7.19. Adverbs of uncertainty with [knower] + [know] + *wh*

Two related ways of indicating uncertainty involve mental predicates with *that*-clauses (e.g. THINK *that*) and certain verbs with *if/whether*-clauses. Lines 1-6 of Figure 7.20 are examples of the former with this meaning frame; these have a frequency of around 7.8 pmw. Most of the 'knowing' verbs are represented, but those most associated with this type are APPRECIATE, REALIZE and UNDERSTAND (all around 4% of their instances). The most prevalent (71% of instances) predicate is THINK (*that*), followed by BE *sure* (*that*) with 17%. Other attested verbs include *believe, expect, assume* and *suspect* and *suppose*. These expressions make it explicit whose judgement is at stake, and also more easily allow for reporting than do modal verbs; more than half of these instances involve reported judgements,

that is either past tense or attributed to a third person (lines 2 and 4). In the other

cases, such as lines 1 and 3, the speaker is offering their judgement of the

situation. Line 5 provides an example of a related subset of instances, all involving

UNDERSTAND (with one instance of APPRECIATE) with the expression MAKE *sure /*

ENSURE *that* (0.5 hits pmw). All but one of these instances co-occur with an

expression of obligation, as in the example (*should*).

1	I think the teachers co, but **I think** the teachers	realize what	they are like.
2	The quarrel wouldn't do either of them any good [...] but he **thought** he	knew which	one it would harm most .
3	first of all you have to understand the word 'intelligent' in the way he meant it and I**'m not sure** that I	know what	he meant; and there are any number of ways of being intelligent.
4	At this stage I **don't think** he	saw what	I was leading up to.
5	The GMC *should* **ensure that** all final year medical students	understand what	they can realistically expect.
6	The broadcast began with an upbeat picture of life in Britain -- **asking the viewers if** they	recognised which	country it was .
7	**I don't know if** you	realize what	hell it is to leave the life one leads, and go to a new city where one knows no-one and nowhere to go.

Figure 7.20. Examples of [think] *that* and [ask] *if* showing uncertainty with [knower] + [know] + *wh*

There are also around 2.6 hits pmw of 'knowing' instances embedded within

other *wh*-clauses, more specifically *whether/if*-clauses (see lines 7-8). These

exploit the uncertainty meaning of the *wh*-clause itself (Quirk et al. 1985, Trotta

2000), particularly with question-oriented predicates such as ASK, *doubtful* and

don't know. Like mental predicates with *that*-complement clauses, around half of these instances involve reporting a third party and/or past doubt, as in line 7.

Conditional clauses provide another way of expressing uncertainty (Perkins 1983, Gabrielatos 2010); they have a frequency of around 11.7 pmw with this meaning frame. Of the 'knowing' verbs, KNOW and UNDERSTAND have some association with conditionals, although this is weak (around 3% of **V wh** instances of each verb). Conditional clauses introduced by *if* greatly predominate (more than 97% of instances).

The first 2 lines in Figure 7.21 are examples of 'unreal' conditionals, which make up around 40% of the total; in both cases, the speaker suggests that the subject referent does not *know* or *understand* the answer to the implicit question. Lines 3 and 4 show instances of uncertainty referring to shared information that have become rather fixed expressions in English and account for around 23% of the total; the use of the *if*-clause could be seen here as giving the listener the option of asking for clarification. In lines 5 and 7, we can note the only other means of introducing conditionals 'if' words that occur more than once. *In case* introduces unwanted conditions and only occurs with FORGET, while *unless* co-occurs with UNDERSTAND, RECOGNISE and APPRECIATE in situations where this 'understanding' or recognition is a necessary condition for further development. S*o long as*, *supposing* and 'subject-operator inversion' (Quirk et al. 1985: 1094) with *had* are the other means of introducing conditionals.

1	And anyway, even **if** we really	understood how	to measure intelligence, that is not the point.
2	**If** you	knew how	ridiculous you look standing there with nothing on and your
3	But helping our spread **if** you	know what	I mean.
4	Posing himself against a background, **if** you	see what	I mean.
5	**In case** I	forget where	I've put it.
6	That is to say, a system could not be cognisant **unless** it	appreciated how	intentional changes in its perceptions were constrained by reality.
7	The possibilities of Total Communication are colossal **if** the practitioner really	understands what	the children actually perceive when they see teachers using it.
8	**If** you don't	realise what	you've done as you knit you may notice at a later date just one wrong row somewhere in your knitting!

Figure 7.21. Examples of conditional clauses containing 'knowing' verbs

Yes-no questions are the most frequently found means of expressing uncertainty with this meaning frame, at 34 occurrences pmw. This is due to their strong association with the 'knowing' verbs NOTICE (12.5% of NOTICE *wh* instances), KNOW (9%) and REMEMBER (10%). The uncertainty derives from the fact that they show 'a speaker's ignorance or doubt' (Perkins 1983: 111). *Yes-no* questions with **V wh** have two main functions, one of which is to ask for information which will resolve the uncertainty, in which case they are 'neutral' as regards the answer (Quirk et al. 1985) and the other being more rhetorical, not necessarily requiring an answer or even sometimes a response. While there may not be a clear boundary between the two, co-occurrence features are associated with particular uses and verbs and illustrated by the examples in Figure 7.22.

Lines 1-3 illustrate indirect questions, in that the speaker expresses ignorance. This is associated with genuine *wh*-clauses, one of each type is shown here – polar (line 1), infinitival directive (line 2) and information *wh*-clause (line 3); in line 3 we can also see that the addressee treats this as a genuine question. The verbs KNOW, NOTICE and REMEMBER are most represented in this type, which accounts for around 34% of instances. Lines 4 and 5 involve a relatively fixed phrase *do you see what I mean/understand what I'm saying* which, like *if you know what I mean* suggests that the interlocutor(s) will probably know (see response in line 5), but allows them the possibility of asking for clarification (12.5% of instances).

Line 6 shows a usage that is particularly associated with NOTICE and REALISE[1] (around 60% of their *yes-no* question instances) as well as REMEMBER, almost exclusively with *wh*-exclamatives and declarative-*how* clauses, to raise a point that the addressee is supposed to be aware of. This usage is closely associated with the more emphatic 'negative' questions in lines 8 and 9 (*have you forgotten* being very similar to *don't you remember*) and occurs with similar verbs; combined these account for around 9% of the total.

Line 7 is an instance of a pre-announcement (Schegloff 1988) where the provision of the answer suggests the speaker thinks the addressee does not know. These instances are most associated with *(do you) know* and it is noticeable that they have a particularly high proportion of auxiliary elision (70%) as in line 7.

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[1] More specifically, *do you realise how...?* and *have you noticed how...?*

1	When you were searching the kitchen area for the assailant, **did you**	notice if	one of the windows wasn't properly closed ?
2	'**She**	know how	to use the phone?' he asked .
3	yes it came out on a Saturday, **do you**	remember where	you saw it ? yes, I was on a coach to the boat show erm at Earls Court when, when I read it
4	I don't really want to bother of interviewing somebody else and getting somebody else, **do you**	see what	I mean?
5	He looked into her blank face. '**Do you**	understand what	I 'm saying?' She nodded very slowly.
6	I pointed at him. '**Do you**	realise how	close you are, right this minute, to the breadline?' He snorted impatiently.
7	'	Know what	I told 'em? Prizefighting, I says.
8	**Have you**	forgotten how	easy it is to delude yourself into believing you are in love?
9	'Are you crazy? **Don't you**	realise what	he's doing behind your backs?'

Figure 7.22. *Yes-no* questions with [knower] + [know] + *wh*

Examples of other 'uncertainty' exponents not covered in the discussion so far are provided in Figure 7.23. The most noteworthy is SEEM *to* (1.5 hits pmw). This is an interesting expression as it is associated with evidential meanings, explicitly linking the level of certainty to an inference based on evidence in a way that is not generally possible with modal verbs of uncertainty (Palmer 1990). At the same time, it is interesting to note that two main types of verbs associated with SEEM *to,* 'realising' verbs (*appreciate, notice, realise, recognise*) and *forget*, are also the only ones to co-occur with 'uncertain' *must,* which Palmer (1990) also associates with evidential meanings. The other two lines involve the only other repeated forms expressing uncertainty. With line 3, the overall meaning seems to be that 'we can

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have no expectation', so this is high certainty. Line 4 is interesting because it – like the similar RUN *the risk of* – adds an extra element to the uncertainty by expressing the unwanted nature of what might happen (cf also *in case*).

1	TNC **does not seem to**	recognize how	worthwhile changes in assessment need to be 'slowed' by teachers
2	The mood of the party grew sombre. Even Ratagan **seemed to have**	forgotten how	to smile, and the sternness of the Myrcans deepened.
3	She can't be **expected to**	appreciate what	our cells mean to us. To her, they are simply rooms.
4	Was she **in danger of**	forgetting who	she was? she wondered bleakly.

Figure 7.23. Examples of other uncertainty expressions with [knower] + [know] + *wh*

We have seen in this section that 'knowing' verbs occur with the full range of means of expressing and reporting uncertainty. The fuller survey of uncertainty compared to earlier chapters has also given the opportunity of investigating how these different types vary the level of uncertainty and allow the expression of other meanings in combination with uncertainty, e.g. inference based on evidence, undesirability.

7.2.5 Negative [knower] + [know] *+ wh*

A very high proportion – nearly 35% – of all 'knowing' instances are straightforward negative. This is in stark contrast to all the meaning frames seen so far, which have very low proportions of negative forms. This puts into perspective the

statement by Quirk et al. (1985: 1184) that a *wh*-clause 'generally implies a lack of knowledge on the part of the speaker' and tend to occur where the 'superordinate clause is interrogative or negative', since this only really applies to this meaning frame (and 'caring' verbs in Section 7.3). The high proportion of negatives with 'knowing' verbs is partly due to their strong association with KNOW (40% of KNOW *wh* instances are negative); the ignorance expressed in these instances (*I don't know wh*) is mirrored by the very high proportion (60%) of instances of FORGET which are positive and which also express (usually current) ignorance. With these negative instances, first person is found around 65% of the time (57% present tense; 8% past). Lines 1 and 2 of Figure 7.24 show present tense first person instances. Lines 3 and 4 show ignorance attributed to third parties.

1	At present, we **do not**	know how	smoking might promote either gall stone formation or the development of symptoms .
2	So, although we know that the phenomenology of motion-perception varies under differing conditions, we **do not**	understand why	our experience varies as it does .
3	Mimi **did not**	appreciate what	this meant to him and sent them away , but Jack went downstairs looking for them and signed .
4	Many candidates **don't**	recognize what	the question is driving at .

Figure 7.24. Negative [knower] + [know] + *wh*

The prevalence of negative instances of 'knowing' verbs shows that it is important to be able to express lack of knowledge and that it is not always the case that the

'superordinate clause expresses concern with the closing of [the] gap' (Quirk et al. 1985: 1060) created by the missing information in the *wh*-clause.

7.2.6 Indicative [knower] + [know] *+ wh*

Indicative 'knowing' instances, while frequent, are not of course of particular interest as they are not modal. They account for around 21% of the total for this meaning frame; 'knowing' verbs most likely to be in indicative instances are REALISE (51% of instances) and NOTICE (37%). Around 31% of these are first person present like line 1 in Figure 7.25. A further 26% are third person past instances like lines 2-4, which may involve sudden knowledge (lines 2-3) or general expertise (line 4). The other large group is second person present tense like line 6 (22%). Certain 'knowing' verbs in indicative forms are very likely to be associated with declarative-*how* clauses (line 3) or *wh*-exclamatives (lines 2 and 3): NOTICE (86% of the time), APPRECIATE (68%), REMEMBER (66%), REALISE (55%) and RECOGNISE (45%). In these cases, no real question is raised and there is therefore no 'information gap' to fill.

1	he phoned me on Tuesday and said, now I	remember what	I wanted.
2	*It was only after* we had left, and were returning home *that* I	realised what	a good feeling it was to have helped someone in pain.
3	He looked inside the cover and	noticed how	Sir Ralph had scrawled prayer after prayer to St Julian.
4	They *really*	knew how	to raise money and, as a result, the final figure collected was about £1.5 million.
5	Doctors and other experts also	recognise how	important a balanced diet is for a child's normal development.
6	You	know what	these BBC chaps are like

Figure 7.25. Examples of indicative [knower] + [know] + *wh*

In this section we have seen that 'knowing' verbs have their own associations with particular modal and non-modal meanings in occurring a great deal more often with uncertainty and non-modal contexts.

7.3 The meaning frame [carer] + [care] + *wh*

This meaning frame involves just two verbs, CARE and MIND. This was the easiest meaning frame to formulate, since the meaning of the two verbs concerned is relatively distinct from other verbs in this study, as a number of earlier studies have noted, at least for CARE (see Table 7.6). The link to 'knowing' verbs is principally due to the analysis of CARE and MIND as typically 'stative' verbs, referring to situations over which we have little control.

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Table 7.6. Classifications of CARE *wh* and MIND *wh* in previous studies.

study	meaning groups	example verbs
Karttunen (1977)	verbs of relevance	*matter, care*
Francis et al. (1996): V wh pattern	THINK	*care, consider, decide, determine, forget, guess, imagine, know, mind, predict, remember, see, think, understand, wonder*
Biber et al. (1999)	Attitude / emotion verbs	*care*
Trotta (2000)	Concern	*care*
Huddleston & Pullum (2002)	Significance	*matter, care*
current study	[carer] + [care] + *wh*	*care, mind*

Table 7.6 shows that there is general consensus that CARE is different from other verbs with *wh*-clause complementation, while MIND generally escapes mention. Francis et al. (1996) place it in the same group as CARE, although with a number of other items. We have already seen that the rather large THINK meaning group in Francis et al. (1996) yields verbs that can be placed in a number of different meaning frames. However, the samples of these two verbs indicate that they typically combine the two main aspects of meaning noted in previous studies, that is 'concern' (Trotta 2000) and 'significance / relevance' (Huddleston & Pullum 2002; Karttunen 1977), but that they also tend to indicate a *lack* of these features, since the vast majority of instances (around 90%) have negative polarity. This percentage rises even higher if one includes instances of *who cares wh* and other 'rhetorically', if not grammatically, negative instances, almost all of which point to

the fact that the answer to the *wh*-clause question is *unimportant* to the subject-referent (always an animate entity; see examples in Figure 7.26).

1	I don't care . I don't	mind how	many men you've slept with .
2	[I am glad that has been made clear . 'I don't	mind where	I go , but I prefer opening , and the main thing is that you know where you are.'
3	'I don't	care if	they are all like that,' Nora said.
4	'Legally, at least, we're still very much married.' 'I don't	care if	it's legal **or** not. I don't feel joined to you in any way.'
5	TERRORISTS who planted a 400lb bomb at a Glengormley hotel didn't	care how	many people they killed , local councillors have said .
6	He paused. 'I don't	care if	the prince of Wales is coming to see you! I want you here, right now.'

Figure 7.26. Examples of [carer] + [care] + *wh*

The examples of the two verbs in Figure 7.26 illustrate these points. In each case, the verb phrase could be replaced by *it is/was not important (to me/them)* without a significant change to the meaning. This sense of not caring is in part linked to the meaning of the *wh*-clause, whether alternative (line 4), polar (lines 3 and 6) or *wh*-exclamative (1 and 5); even an extreme answer will not change the attitude of the speaker.

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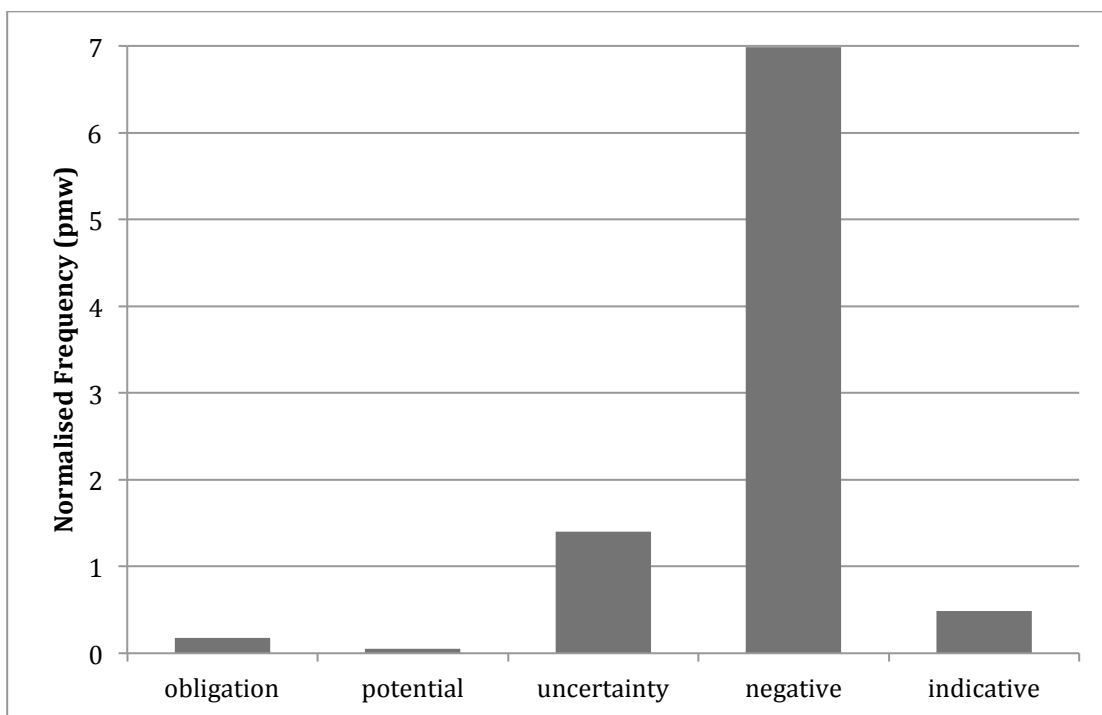
Figure 7.27. Distributions of modal and non-modal meanings for [carer] + [care] + *wh*

The distributions of modal and non-modal meanings for [carer] + [care] + *wh* shown in Figure 7.27 indicate the prominence of negative instances. The only other meanings that are over 5% of the total are expressions of uncertainty (15%) and indicative (5%). Areas of modal meaning such as obligation, potential and volition are conspicuous in their very low frequency; it is very unusual to talk about someone's ability, need or desire to care about a question. The following sections will therefore focus mainly on the area of uncertainty and negative instances of the meaning frame.

7.3.1 The expression of uncertainty with [carer] + [care] + *wh*

The concordance analysis of CARE and MIND found that instances of uncertainty represent around 15% of the total extrapolated frequency for the meaning frame. The different means of expressing uncertainty are distributed as indicated in Figure 7.28. We can note that while a range of different types were found, none of the them is frequent, but also that, as with 'knowing' verbs, modal verbs of uncertainty are not the most prevalent way of indicating uncertainty. The general pattern for instances in this frame to be negated is also found with expressions of uncertainty.
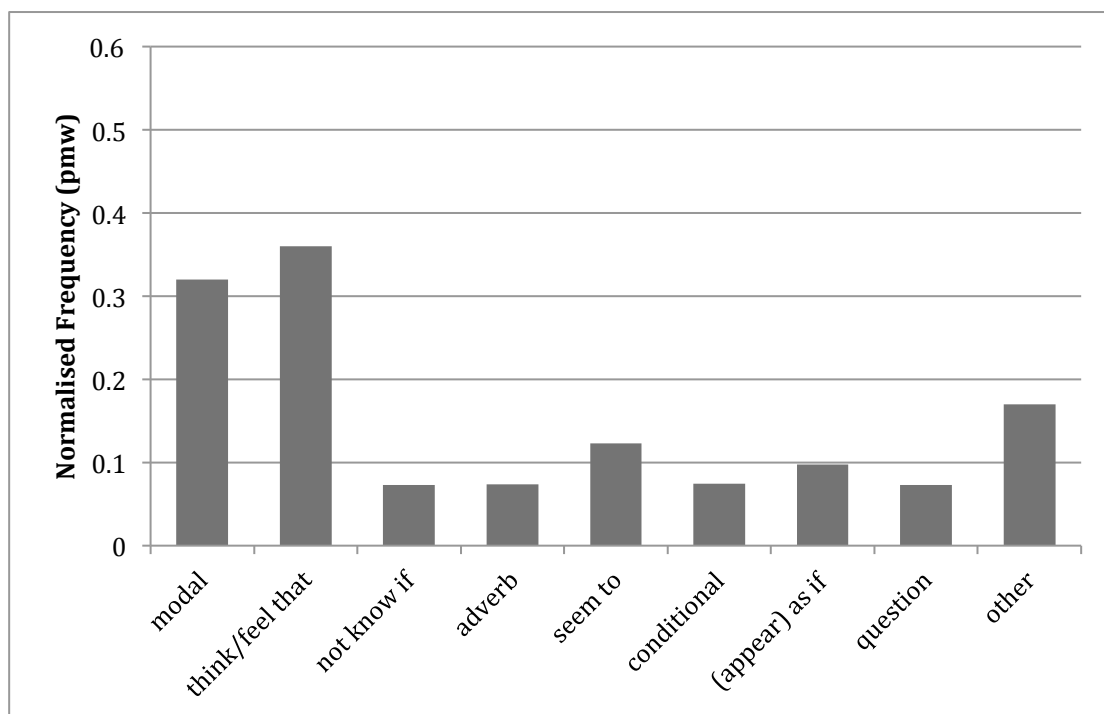
Figure 7.28. Distribution of uncertainty types for [carer] + [care] + *wh*

The instances in Figure 7.29 show 'caring' verbs qualified by modal verbs indicating a judgement of uncertainty. Around half of the instances involve *would* with the rest split evenly between *will* and lower degree certainty *may*. As noted above, even where the instance is not negative (line 4), the implication is that the subject-referent does not care. Around half of these instances involve reporting a third party's judgement of certainty (see items in italics) rather than the speaker's.

1	I mean we can wait but they **won't**	mind which	is which .
2	There are times when he considers it again *he says* ; I **would not**	care if	I dropped dead tomorrow .
3	For example , *said Mr Webster* , while many investors shun nuclear weapons at all costs, they **may not**	care if	the portfolio includes alcohol.
4	Now, while I am at least mildly interested in his thoughts on evolution, *why would* the publisher of Angell's book *believe* I **would**	care what	Gould thought about a baseball book ?

Figure 7.29. Examples of modals of uncertainty with 'caring' verbs

Examples of uncertainty involving mental predicates with *that*-clause complementation are shown in Figure 7.30. These instances make explicit who is making the judgement of uncertainty and are thus an effective way of detaching oneself from this judgement. There are two main types: 'thinking' predicates, which indicate lack of certainty (THINK, GET *the feeling*, FEEL, SUSPECT) and 'knowing' predicates (KNOW, REALISE), of which the former account for around 70% of instances.

1	**I don't think** I really	minded what	happened , though certainly the thought of a few more cannon shells flying past me did n't exactly cheer me up .
2	**Do you think** they don't	care who	protects them?
3	**I don't get the feeling that** they particularly	care whether	this murder is solved or not
4	Then her eyes flashed angrily and Jack **knew that** she didn't	care what	secrets he betrayed

Figure 7.30. Examples of mental predicates with [carer] + [care] + *wh*

There are a few other instances of [carer] + [care] + *wh* with uncertainty that are noteworthy. Some examples are provided in Figure 7.31; all of these exponents have frequencies of around 0.1 pmw.

1	**Obviously**, he wanted to see blood , and did n't much	care whose	it was . Now Clive was in the circle with Skinner .
2	'You don't seem to	care if	I'm tired'
3	But as time went on he **seemed not to**	mind who	saw him , who heard about his infidelities . That was life as he lived it and that was that .
4	They all wait for him to go on , while **appearing as if** they dont	care whether	he goes on or not. 'Well, go on,' says Howard.
5	'You must be Nicholas Breakspear,' he said carelessly , **as though** he did not much	care whether	I was or not.
6	**If** the Army doesn't	care what	happens to its lecturers then that 's no skin off our nose .
7	'Furthermore, you'll be none the wiser about Kelly. Or **don't you**	care what	's happened to your friend?'

Figure 7.31. Other examples of uncertainty with [carer] + [care] + *wh*

Evidential forms such as *obviously,* SEEM *to* and APPEAR *as if* are shown in lines 1-4*.* Arguably, *as though* in line 5 is also an evidential form, linking the evidence (speaking carelessly) with a tentative conclusion. As noted above, these meanings

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are not usually associated with modal verbs. There are also instances of *if* conditionals and *yes-no* questions. Line 6 seems to suggest that the *Army* does not in fact care; line 7 is an example of a biased question, suggesting that this is the likely conclusion that one would draw.

7.3.2 Negative [carer] + [care] *+ wh*

The example instances provided in Figure 7.26 and the comments made there hold in general for negative instances of 'caring' verbs.

7.3.3 Other instances of [carer] + [care] *+ wh*

There are other instances of this meaning frame which were recorded in the obligation or indicative columns in Figure 7.27. Some examples are provided in Figure 7.32. There are two main phraseologies: *why should X care wh* and *who cares wh ...?*. As noted above, the more common expression *who cares wh?* (around 0.36 hits pmw) is effectively a negative since it expects an answer in the negative, as the following sentence in line 3 shows. The phraseology *why should* X *care* is also a rhetorical question, expecting the answer 'no'; in this respect, it is interesting to note that, when it is reported, as in line 1, a marker of speaker attitude (*truculently*) may be added.

1	Khrushchev asked truculently **why he should**	care what	happened to the enemies of the working class .
2	'Why should you	care what	a lot of old tabbies think?
3	Who	cares what	anyone says? It won't bother me, it shouldn't bother you -- and it certainly won't trouble our son.
4	Who	cares whether	or not the Messiah is a Litvak?

Figure 7.32. 'Other' examples of [carer] + [care] + *wh*

7.4 Conclusion.

This chapter has described two meaning frames, [knower] + [know] + *wh* and [carer] + [care] + *wh*. Both of these, but in particular [carer] + [care] + *wh* avoid expressions of obligation, volition and potential. This is felt to be consistent with their usual categorisation as 'stative' or 'inert'. However, where these meanings are seen, they are associated with particular verbs or, arguably, change the meanings of these verbs.

CHAPTER 8 – 'SHOWING', 'EXPLAINING', AND 'DETERMINING' MEANING FRAMES

8.1 Introduction

While the processes of 'communicating', 'knowing', 'thinking', and 'discovering' described in Chapters 4-7 typically involve an animate being (or surrogate, for example, a text as source of knowledge) as subject, this chapter discusses a series of meaning frames which are based on the identification of subjects as inanimate. The frames with inanimate subjects account for a small minority of **V wh** instances, comprising less than 5% of the concordance lines sampled, which is unsurprising since the posing or answering of a question is likely to involve an animate entity.

The discussion of the polysemy of EXPLAIN *wh* in Section 3.4.3 introduced the idea that the distinction between animate and inanimate subject referents, also noted by Hanks (2013)[1], may be an important one in terms of discerning semantic differences and formulating meaning frames. It was shown there that, where one finds inanimate subjects such as abstract nouns and markers of encapsulation including *which, this, it* (Sinclair 2004), a different meaning of EXPLAIN can be proposed ("situation is the reason for") and that this meaning is associated with far

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[1] with reference to verbs in general, not specifically **V wh** verbs

higher proportions of *why*-clauses than the other meaning (which became the meaning frame [source] + [describe] + *wh*). Moreover, the types of modal meaning associated with the two meanings of EXPLAIN *wh* also differ; where inanimate subjects are found modal meaning is confined mainly to uncertainty. This is because there can be no 'disposition' of an inanimate subject to answering the question posed by the *wh*-clause; Coates (1983) and Biber et al. (1999) also note the link between inanimacy of subjects and epistemic meanings of modal verbs such as *will*.

Apart from EXPLAIN, there are other verbs which can be seen to have different meanings when they have inanimate subject referents, with quite similar modal associations. These are grouped into three meaning frames based on 'showing', 'explaining' and 'determining' as shown in Table 8.1.

Table 8.1 Showing, explaining and determining meaning groups in the literature

Meaning frame	Verbs	Analogous group(s) in the literature
[evidence/test] + [show] + *wh*	*demonstrate, indicate, reveal, show*	SHOW (Francis et al. 1996)
[situation] + [explain] + wh	*explain* (*demonstrate, indicate, reveal, show*)[1]	
[factor] + [determine] + *wh*	*determine* (*choose, decide, establish, specify*)[1]	DETERMINE (Francis et al. 1996) 'Contingency' (Trotta, 2000) 'dependence' (Huddleston & Pullum, 2002)

[1] the verbs in brackets only occur in this meaning frame in small numbers of instances

Table 8.1 provides information regarding the meaning frames surveyed in this chapter; analogous meaning groups in the literature are included where they are

found. With the exception of [factor] + [determine] + *wh,* meaning groups analogous to these meaning frames are generally harder to find in the literature compared to meaning frames proposed in other chapters. One can attribute this to the general tendency to focus on the most salient, or 'core' meanings of verbs in isolation (a position stated explicitly by Trotta (2000: 94)), which results in less frequent meanings being overlooked; none of the meaning frames covered in this chapter represent a majority meaning for the verbs involved. Francis et al. (1996) is an exception to this tendency in that different senses of the same verb are listed in different meaning groups; this may explain why their meaning groups coincide with two of the three meaning frames.

This chapter will discuss each of the proposed meaning frames in turn, starting with [evidence/test] + [show] + *wh* (Section 8.2), then moving on to [situation] + [explain] + *wh* and finally [factor] + [determine] + *wh.*

8.2   The meaning frame [evidence/test] + [show] + *wh*

With the exception of Francis et al. (1996), studies of *wh*-clause complementation tend not to posit a separate 'show' group of verbs, preferring to class SHOW, DEMONSTRATE, REVEAL and INDICATE as 'communication' verbs (e.g. Biber et al. 1999: 986). However, a focus on the 'core' meanings of these verbs overlooks a significant minority of instances; between 24% for INDICATE and 32% for REVEAL.

These instances form the meaning frame, [evidence/test] + [show] + *wh*; their identification is dependent on a reading in which the interpreter of the 'evidence' or the 'test' is "suppressed, so that the results themselves … are made to appear responsible for the conclusions" (Hunston, 1993: 70).

Chapter 6 showed how instances of the verbs SHOW, DEMONSTRATE, REVEAL and INDICATE are included in the meaning frame [source] + [describe] + *wh*. However, during the analysis of concordance lines for these verbs, a number of instances were found that did not appear to involve 'communication' involving an animate entity or a text. Some examples with the verb DEMONSTRATE are provided in Figure 8.1 to illustrate the issue. Line 1 is an example of [source] + [describe] + *wh*; in such instances an animate entity (*Kochan*) possesses information which is then imparted. In contrast, it is hard to see how examples such as lines 2 and 3 could be interpreted as 'source communicates information', as this would involve interpreting *evidence* or a *fact* as an animate, willing agent. Instead, the *evidence* or *fact* represents the reason for (the writer's) drawing a particular conclusion. Likewise, where an analysis or test of some kind is referred to, as in line 4, it is not in fact the 'test' itself, but its result, which demonstrates the answer to the question that is posed. In such examples, it is not explicitly specified *who* carries out the analysis; the implication is that any person carrying out this comparison should come to the same conclusion. This analysis of a number of typical cases led to the hypothesis that the inanimacy of the subjects was a key factor, linked to a reading of the verb as something like "represents evidence regarding"; in contrast, the

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animacy of subjects in examples like line 1 is associated with a reading of the verb

as 'presents evidence regarding' (Thompson forthcoming).

1	**Kochan**	demonstrates how	the autocracy failed to absorb these grievances and changes in society.
2	**This evidence**	demonstrates how	even well-educated people can hold mutually contradictory beliefs
3	**the fact that** the tiger is unable to figure it out from our behaviour that we have practically no sense of smell,	demonstrates how	instinctive and preprogrammed are their mental functions .
4	**A quick comparison of** the two line standards is enough to	demonstrate how	even an extra 100 lines of definition can greatly enhance the sharpness and colour of images.

Figure 8.1. Examples of the different senses of DEMONSTRATE *wh*

The regularities of meaning identified in these more clear-cut instances allowed the

formulation of the meaning frame [evidence/test] + [show] + *wh* and helped with the

categorisation of difficult-to-place instances by suggesting typical features of the

frame.

The results shown in Figure 8.2 indicate that the majority of instances do not

involve modal meaning, while a significant minority (around 26% of the

extrapolated totals) involve some expression of uncertainty. What is noticeable is

that meanings obligation, volition and potential do not occur. This can be

associated with the inanimacy of the subjects; such expressions generally depend

on the identification of an animate agent (Coates 1983, Biber et al. 1999).
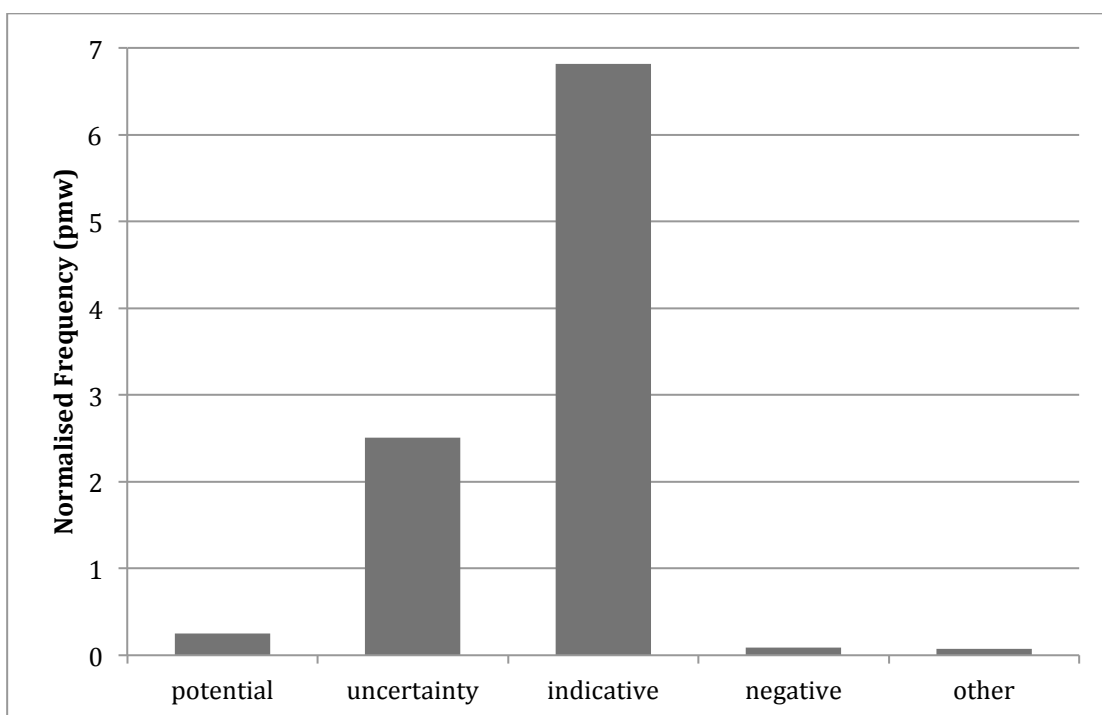
Figure 8.2. Distribution of modal, non-modal meanings for [evidence/test] + [show] + *wh*

8.2.1 The expression of uncertainty with [evidence/test] + [show] *+ wh*

A range of means of indicating uncertainty were identified in the concordance lines analysed as part of this study. In terms of [evidence/test] + [show] + *wh*, around 68% of instances of uncertainty involve modal verbs (see Figure 8.3). Smaller proportions (both around 11% of total extrapolated instances) either involved expressions referring to evidence or lack of evidence or mental verbs followed by *that*-clauses.

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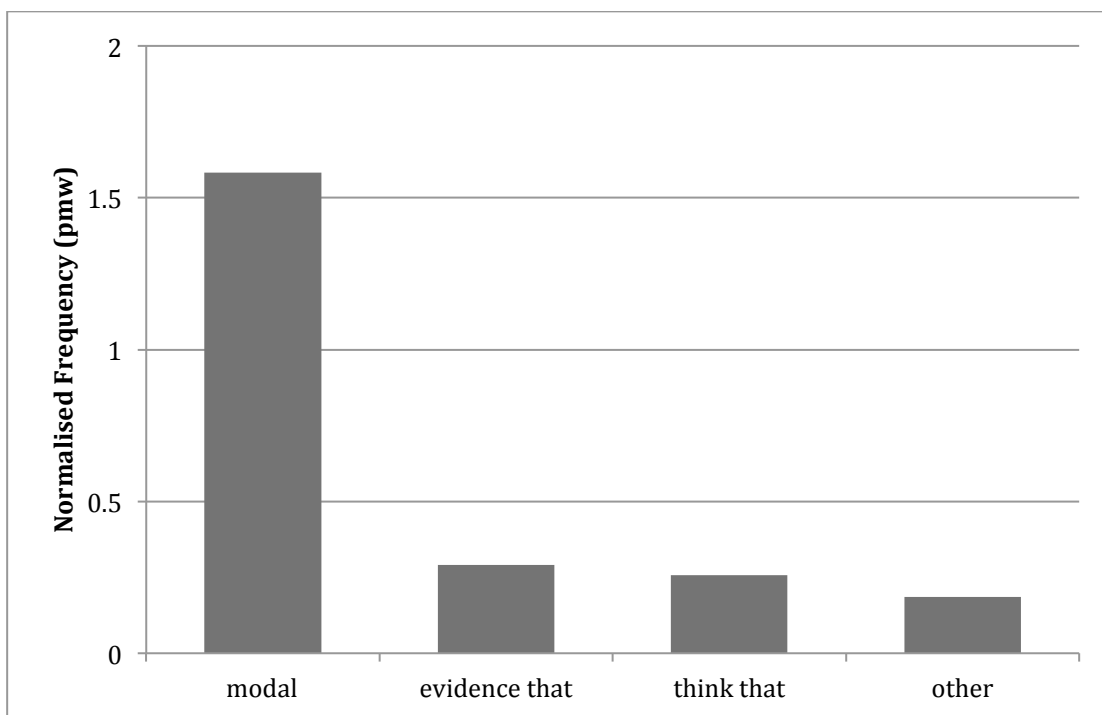
Figure 8.3 Distribution of exponents of uncertainty with [evidence/test] + [show] + *wh*

The examples provided in Figure 8.4 involve 'showing' instances with modal verbs. While 61% of instances involve *will*; as the examples in lines 1 and 2 show, all these instances indicate strong confidence in the predictions (or claims) made. In contrast, the instances with *would* (16%) are more likely to combine with a harmonic expression such as *it was hoped that* suggesting lower confidence. The remaining instances show a gradual weakening of levels of certainty through *should, may* and *might*, as well as hypothetical *might have*. With certain instances, such as line 5, other interpretations than uncertainty could be available – permission, in this case. However, the previous sentence indicates that the *treaty language* is to be treated as 'evidence' of the intentions of those who use the

language. This shows how the interpretation of the subject as inanimate is associated with the interpretation of the meaning of the modal verb and other co-textual features. Instances with *should* such as line 4, however, as noted in Section 6.2.4, may be ambiguous between 'obligation' and 'uncertainty' readings particularly in cases like this where the different interpretations ("are likely to" vs. "are required to") are available.

1	The historical legacy of this suspicion of parliamentary government is nowhere clearer than in the constitution of the Vth Republic, and an examination of this **will**	show how	, with partial replacement of national by EC government, different countries have different things to lose.
2	The results **will**	indicate if	the child is learning from the intervention .
3	*it was hoped* that the exercise **would** not only	reveal where	the problems lay, but also...
4	The results of the research **should**	demonstrate how	effective such tripartite training bodies are in fostering agreement on the training needs of the sectors concerned
5	It has been suggested that the appropriate test is 'whether the parties are making some serious promises or undertakings' which are intended by them to be acted and relied upon. The treaty language **may**	reveal whether	the parties shared such intentions .
6	To date relatively little attention has been paid to the detailed morphological evidence that **might**	indicate which	, if any, of the proposed models is applicable to any particular passive margin.
7	In the first of the two instant appeals, for example, the tape **might have**	revealed whether	the investigators' tone of voice was unduly menacing, or the accused 's particularly timid .

Figure 8.4. Modals of uncertainty with [evidence/test] + [show] + *wh*

Figure 8.5 shows other means of expressing uncertainty with [evidence/test] + [show] + *wh*, none of which are found with a frequency of over 0.3 pmw with this meaning frame. These examples show that, while modal verbs are used to indicate the speaker's level of confidence regarding whether the answer is revealed or not, 65% of the instances involving other forms express an avoidance of commitment on the part of the speaker by means of attribution to a third party. Thus, while *perhaps* in line 1 and *there is no reason to doubt that* in line 2 indicate varying levels of certainty, the other lines involve what Stubbs (1996) refers to as 'detachment' and hence provide examples of what is often termed evidential modality (Chafe & Nichols 1986; Stubbs 1986, 1996; Palmer 2001). This is achieved by means of *apparently* in line 3, claiming that there is a lack of evidence or data in lines 4 and 5 (where a further expression of detachment, *as far as I am aware*, is seen), or by explicitly naming the source of the information in lines 6 and 7. These examples show how attribution to a third party is linked to a general wish to show that there is argument about whether this particular evidence really does show what it is said to show.

1	The more violent film was not followed by any more intense or hostile dreams than the bland one – **perhaps**	indicating how	accustomed these young subjects were to watching violent westerns!
2	**there is no reason to doubt that** over a long period movements in prices and wages do	indicate whether	population was rising or falling .
3	That the acid deposition problem became accentuated after the 1950s […] also **apparently**	indicated where	the cause lay.
4	**No data are available to**	show how	long fluid persists in severe cases that would normally have been listed for surgery .
5	So far as I am aware, we **have no evidence**, for example, **to**	show whether	male unemployment […] has enabled tending tasks of old relatives to be taken on by men who remain at home.
6	And within minutes, the fire was out. **Nuclear Electric is keen to stress that** such exercises	demonstrate how	safety conscious the industry is […] But opponents of nuclear power remain unconvinced
7	But Labour candidate **Peter Mandelson said** it	showed how	people were suffering under the NHS in its present state.

Figure 8.5. Other examples of uncertainty with [evidence/test] + [show] + *wh*

8.2.2 Indicative [evidence/test] + [show] *+ wh*

As Figure 8.2 shows, the majority of instances (72%) of [evidence/test] + [show] + *wh* are indicative; the evidence or the test result is generally asserted as proving the point. Clearly, from the point of view of modal meaning, such instances are not of interest except inasmuch as they indicate trends and contrasts seen elsewhere in this thesis. The main point to make is that here we see an association between lack of modal meaning and the type of *wh*-clause typically chosen; there are quite high proportions in particular of *wh*-exclamatives (42% of instances) and to a lesser extent declarative-*how* clauses (12%), both of which present the *wh*-clause

information as presupposed. These proportions are fairly stable across the four main verbs (DEMONSTRATE, INDICATE, REVEAL, SHOW).

The examples in Figure 8.6 illustrate this association. The *wh*-clauses in lines 1, 3 and 4 are *wh*-exclamative clauses, indicating that a particular answer – and frequently a particular attitude to the answer – is expected. Line 2, meanwhile, is compatible with a declarative-*how* reading (Huddleston & Pullum 2002) in that the *how*-clause does not really contain a gap of information. The final two lines have 'genuine' *wh*-clauses, where no indication is given regarding the answer.

1	This sort of first-hand evidence from the children	reveals how	utterly distorted were the verdicts of groups such as the National Federation of Women 's Institutes
2	In the report of the Select Committee on Welsh Affairs, the BMA quoted figures from 1981-88. Those figures	showed how	the import of what is called 'special' wastes -- toxic and hazardous waste -- had gone up.
3	The possibility of asking such questions	shows how	far the courts have to go in dealing with the issues raised by representative standing.
4	The absence , however , of any encouraging response from his interlocutors , even the minimal one of backchannel ,	indicates how	unsuccessful he is in giving his advice.
5	But even as he stepped off the plane from Taipei , a slip of the tongue	showed how	far the two sides have drifted apart , and how unreal to Taiwanese is the official vision of reunification.
6	After some discussion it was realised that this was a *what/how* problem, ie the analysis had	revealed what	information was needed, but not *how* it appeared in practice
7	The book explains in detail the 20 key points examined in the test . A series of quiz questions at the end	indicates whether	you have absorbed all the information and whether you need more practice at the Highway Code.

Figure 8.6. Other examples of uncertainty with [evidence/test] + [show] + *wh*

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8.2.3 Negative [evidence/test] + [show] *+ wh*

In some cases it is important to point out that the evidence / tests available do not show the answer to the question posed; these negative instances account for less than 1% of this meaning frame. Only INDICATE and REVEAL were found. Two examples are provided in Figure 8.7, with two different types of subject: line 1 involves *evidence* while line 2 shows an example of means of studying, *comparing*. Line 2 and similar instances appear to function more as critiques of the procedure than as expressions of ignorance.

1	The evidence does not	reveal	whether this argument was about or involved the topic of blood transfusions .
2	Comparing levels over twenty- or thirty-year periods does not	reveal	how even was the wage performance over them.

Figure 8.7. Negative Instances of [evidence/test] + [show] + *wh*

8.3 The meaning frame [situation] + [explain] + wh

As discussed in Section 3.4.3, the identification of [situation] + [explain] + *wh* started with the observation of instances of EXPLAIN *wh* that did not fit into the other main sense of this verb – where a source is construed as communicating an idea. Figure 8.8 provides examples to illustrate the differences. In line 1, an animate 'source' is responsible for providing the answer to a question posed in the *wh-* clause. In lines 2 and 3, however, the referents of the subject of EXPLAIN do not so

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much impart information as *represent* an explanation. This interpretation of lines 2 and 3 seems to depend on an associated interpretation of the 'explanans' (the information serving as an explanation) as inanimate, which is further linked to the more frequent use of *why* as the *wh*-word (there are a few instances of *how* and *what*).

1	Geoffrey Cannon	explains how	you can save the planet by saving yourself.
2	The size of the car was also a consideration as space costs money. **It**	explains why	the institution has turned down such giants as as the liner 'United States'
3	There may also be some economies of scale in marketing effort. **These** managerial and financial gains could	explain why	mergers make sense even for companies producing completely distinct products.

Figure 8.8 Instances illustrating different senses of EXPLAIN *wh*

Thus, instances used to present or propose an explanation for a phenomenon or event were classified in the meaning frame [situation] + [explain] + *wh*. This includes around 23% of instances of EXPLAIN *wh* and a very few examples of DEMONSTRATE, INDICATE, REVEAL and SHOW (no more than 2% of any verb). The situation referred to in the first part of the frame relates to information already mentioned in the discourse, using structures such as premodification of noun that present the information as if it is 'given information or common ground' (Hoey 1999: 33). One's acceptance of the explanation will depend on the acceptance of the 'given' information element, which may be why instances of this meaning frame are more likely to be tentative than the other meaning frames in this Chapter.

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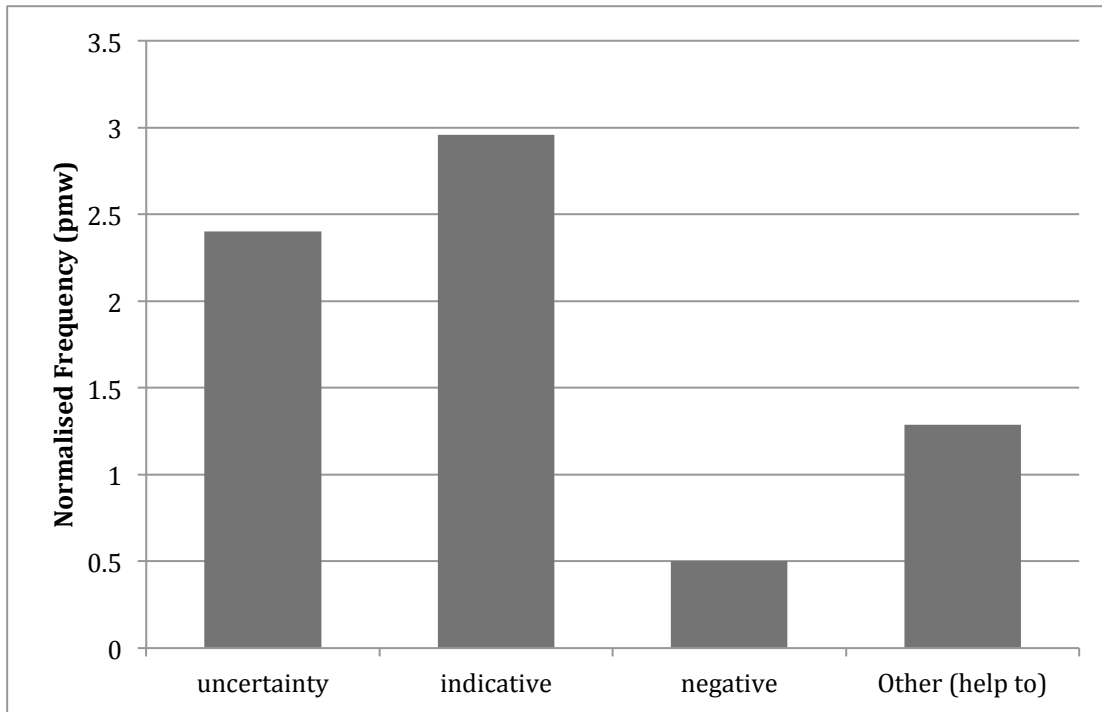
Figure 8.9. Extrapolated distributions of [situation] + [explain] + *wh*

Figure 8.9 shows the distributions of modal and non-modal instances with this meaning frame. Just under half of the extrapolated totals involve either indicative or negative instances, but there is also a relatively high proportion of 'uncertainty' instances (around 33%). This distribution, with a lack of obligation, volition and potential meanings and a higher proportion of uncertainty, follows the pattern seen for other meaning frames involving inanimate and non-agentive subject referents. The following sections discuss these meanings in turn.

8.3.1 The expression of uncertainty with [situation] + [explain] + *wh*

In around 33% of the instances classed as [situation] + [explain] + *wh*, modal verbs
– generally *may, would* and *could* (each accounting for around one quarter of
instances) – are used to express either tentativeness or the hypothetical nature of
the explanation (see examples in Figure 8.10). It is also noticeable that *will* – a
marker of strong certainty found frequently with [evidence/test] + [show] + *wh* –
only occurs twice in this meaning frame and then only in combination with *help* (*to*).

1	**Could** fragrance be vibrating at a similar frequency to that of spirit? **If** so, this **would**	explain why	essential oils may influence the spirit directly.
2	There **may** also be some economies of scale in marketing effort . These managerial and financial gains **could**	explain why	mergers make sense even for companies producing completely distinct products.
3	The results of recent studies **suggest**, however, **that** ursodeoxycholic acid, but not chenodeyxholic acid, also inhibits the nucleation of cholesterol microcrystals from supersaturated bile. This **may**	explain why	low dose chenodeyxholic acid does not prevent gall stone recurrence while the results of this and other studies suggest that low dose ursodeoxycholic acid may do so.
4	Where had Phyllis gone, in between leaving Mrs Brocklebank and telephoning him? It **might**	explain why	she had gone to No. 22 later that night.
5	Their lack of involvement on any deep level with men was, in its way, a liberation and **perhaps**	explains why	so many women, too, admired them, copied their looks and envied their freedom of behaviour.

Figure 8.10. Examples of exponents of uncertainty with [situation] + [explain] + *wh*

As the bolded items in the Figure 8.10 show, modal meaning may spread across
more than one clause or sentence, perhaps suggesting an association between a
lack of certainty about the grounds for the explanans and its explanatory power.
There are also two instances of *perhaps* indicating the tentative proposal of an

explanation.

8.3.2 Negative [situation] + [explain] + *wh*

Only 7% of instances of this meaning frame are straightforward negatives. Examples are provided in Figure 8.11. These instances suggest that the situation only partly explains the reason rather than does not explain it at all.

1	There were at this time close links between the College and the Academy, but *this* alone does not	explain why	why this Bohemian hoped to be honoured by an institution that many leading artists [...] regarded with scorn.
2	Note, however, that while this may help to explain why the Brasserie's sales are disappointing, it doesn't really	explain why	L'Auberge's have fallen.

Figure 8.11. Negative examples of [situation] + [explain] + *wh*

8.3.3 Indicative [situation] + [explain] + *wh*

Figure 8.12 presents instances of [situation] + [explain] + *wh* where the situation is asserted as offering a clear explanation of the question posed (around half of the instances in this sample). Some instances show a degree of overlap with [evidence/test] + [show] + *wh*, demonstrating some of the fuzziness of such meaning frames - see line 5, for example.

1	Norris' ideas seem highly plausible and if this amazing and beautiful process is a correct understanding of part of the physical aspects of the dolphin's 3-D sonar system, it also	explains why	they move their heads from side to side while they are emitting their characteristic echo-locating clicks – they are simply scanning their targets for angular, 3-D information.
2	Marx sees the process of production of concepts, values, and institutions, as extremely complex. This complexity	explains why	the system of concepts and of values has no direct relationship with the process of production; the two don't fit.
3	'Plum' consequently became a blanket term for dried fruit, which	explains why	plum pudding does not actually contain any .
4	Roy Harper is one of those cult figures who never seem to lose popularity -- and his eccentric and entertaining stage presence	explains why	. He's back in the area next week with a gig at the Adelphi on Thursday 19 November.
5	Only the offspring of the wealthy can afford to benefit. These factors again	demonstrate why	the wealth produced by productivity […] does not produce the desired trickle-down effect.

Figure 8.12. Indicative instances of [situation] + [explain] + *wh*

8.3.4 Other meanings of [situation] + [explain] + *wh*

In around 18% of instances, the explanation is not seen as being complete, but merely contributes to an understanding of the question (see Figure 8.13). This meaning is apparent in the use of HELP (*to*), BEGIN (*to*), GO + [amount] + *way to*, which act to mitigate the force of the explaining verb. It is interesting to note that around 40% of the time a further layer of qualification is added to these incomplete explanations by adding modals expressing uncertainty: *should help, could go some way to*.

1	but because of the compromises which had to be worked out, both were left feeling dissatisfied with the eventual outcome, something which **helps to**	explain why	partisan strife continued to grow in intensity after 1689 .
2	Characterization of the molecular basis of the susceptibility genotype *should* **help**	explain why	the risk of myocardial infarct is increased in DD individuals and improve the specificity of risk assessment.
3	Postmodernism , therefore , becomes a certain self-consciousness about a culture 's own historical relativity -- which **begins to**	explain why	, as its critics complain, it also involves the loss of the sense of an absoluteness of any Western account of History.
4	The concentration of women in industries and occupations where seasonal , temporary and casual rather than fixed contract working prevails also **goes much of the way to**	explaining why	the majority of female temporary workers are also part-timers.
5	This train of thought *could* **go some way to**	explaining why	he is one of the top commercial directors in Britain

Figure 8.13. Examples of [situation] + [explain] + *wh* involving incomplete explanations

8.4 The meaning frame [factor] + [determine] + *wh*

This section describes the meaning frame [factor] + [determine] + *wh*, which is used to state that a variable (expressed as a *wh*-clause) depends on another variable (the 'factor'). As noted in Table 8.1, the use of *wh*-clauses in environments where relationships of dependence are expressed has previously been noted by other studies of *wh*-clauses (Francis et al. 1996; Trotta 2000; Huddleston & Pullum 2002). This meaning frame is relatively infrequent, with a normalised frequency of around 5.2 hits pmw. The verb most associated with this meaning, DETERMINE

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expresses 'dependency' in around 28% of **V wh** sample[1] and the other verbs are far less associated: SPECIFY has this meaning just over 3% of the time and DECIDE 2%.

As with the other frames in this Chapter, the formulation of [factor] + [determine] + *wh* resulted from the observation of instances which did not fit into other analyses because the subject referents are inanimate. Figure 8.14 provides some examples of the verb DETERMINE. In line 1, the *policyholders* are not only animate, but in a position of power to make decisions; this instance is therefore classed as an instance of [decider] + [judge] + *wh* (see Chapter 5). In contrast, the subject referents in lines 2 and 3 (*the key factor, basic units of heredity*) are generally seen as inanimate; they also referring to items that vary – the price of houses and combinations of genes. These features are associated with an interpretation of DETERMINE as meaning "depend". Line 4 is included to show a more difficult instance. In this example, the subject, *software*, appears to be inanimate, but it might also be interpreted as an entity capable of 'judging'. However, the information that there are (at least two) different types of operating system leads to an interpretation of software as a 'variable', the choice of which will affect the other variable - *how computers handle data*.

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[1] after removing lines that were not *wh*-clauses

1	Currently, it is the **policyholders** who elect the board and who therefore technically	determine what	the company's investment and bonus strategy will be.
2	Even if all rural houses are not prohibitively priced, they can be expensive relative to the income levels of local inhabitants, and this can be **the key factor that**	determines whether	an individual family can afford to purchase a home.
3	DNA is the stuff of which genes are made: **the basic units of heredity which**	determine what	kind of creatures develop.
4	Operating System. **The software which**	determines how	particular computers handle data – input, storage, processing and output. Two common ones are DOS […] and Unix […].

Figure 8.14. Examples of different senses of DETERMINE *wh*

The distributions of modal and non-modal instances for this meaning frame are shown in Figure 8.15 and indicate that the majority of instances are indicative, while a significant minority (around 31%) involve some expression of uncertainty. This can be associated with the inanimacy of the subjects; expressions of obligation and volition in particular generally depend on an animate agent.

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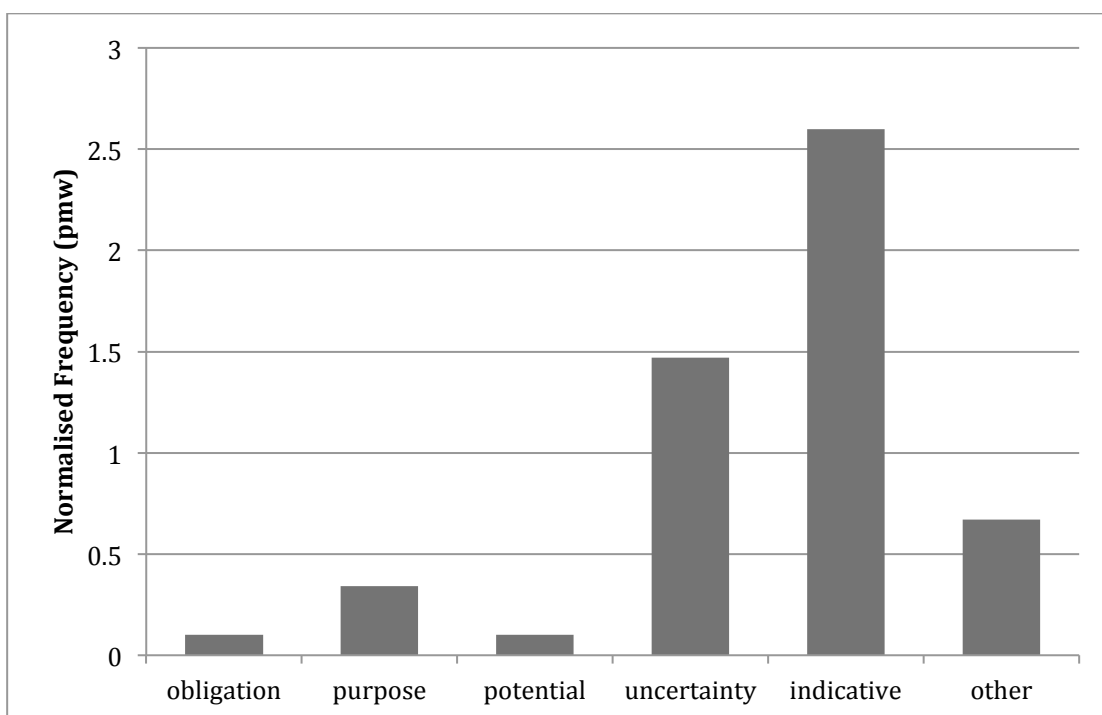
Figure 8.15. Distributions of modal and non-modal meanings for [factor] + [determine] + *wh*

The following discussion will focus firstly on uncertainty, then on indicative and finally 'other' examples of this meaning frame.

8.4.1 Expressions of uncertainty with [factor] + [determine] + *wh*

The expression of uncertainty with this meaning frame accounts for around 28% of instances, and has a frequency of about 1.5 pmw. All but two of the instances involve modal verbs of uncertainty, of which *will* predominates (65% of instances), although other modals such as *could* or *may* express lower confidence of the determining relationship. Examples are shown in Figure 8.16. While only one

instance with *will* attributes the judgement to a third party (*TNC* in line 1) and no instances involve any harmonic weakening expressions such as *I think* or *probably* (Coates 1983), instances involving lower certainty modals seem more likely to involve either attribution (line 4) or other expressions of uncertainty (e.g. *it appears*).

1	These targets, says TNC **will**	establish what	children should normally be expected to know, understand and be able to do at around the ages of 7, 11, 14 and 16
2	The more immediate target is promotion. The next 11 games **will**	determine whether	Kernaghan leads Middlesbrough into the Premier League.
3	Because what you choose to do in the next few minutes **could**	decide whether	a child will live or die.
4	But *they are also nervous that* the calculations they make in the next two weeks **may**	determine who	will win and lose the political battles of the next two years.

Figure 8.16. Examples of [factor] + [determine] + *wh* involving modal verbs of uncertainty

8.4.2 Indicative [factor] + [determine] + *wh*

Indicative instances, which assert the relationship between the two variables as a straightforward fact, account for around half of all [factor] + [determine] + *wh*. Some examples are shown in Figure 8.17, with an indication of the range of items which are included under the label 'factor' – these are bolded in the examples. These examples are not modal and therefore not of interest to this study, but it is interesting to note that 94% of them are present tense; examples like line 4 are very rare.

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1	The acoustics (the **factor** that	determines how	sound behaves) are different at every venue.
2	Looking at the evidence available , there seem to be four main **principles** which	determine who	offers personal care.
3	The simple molecules […] are grouped in trios and arranged in a particular and significant order on the immensely long DNA molecule. This **order**	specifies	how the twenty or so different amino acids are arranged in a protein, how much is to be made, and when.
4	Horror stories abound: […] of the **nepotism** that	determined	who could have a stand in the market

Figure 8.17. Examples of indicative [factor] + [determine] + *wh*

8.4.3 Other instances of [factor] + [determine] + *wh*

While indicative or uncertain instances of this meaning group make up the majority, there are other instances that are of note; some examples are provided in Figure 8.18. The largest usage seen (around 10% of instances) indicates that the first variable is at least partly responsible for the value of the second with phrases such as PLAY *a role in*, HELP *(to)* and BE *important in* (see lines 1-3). Rather than reducing certainty regarding the relationship, these seem to have the effect of downgrading DETERMINE to something like "contribute". Line 4 shows that it is sometimes possible to deny the relationship - there are only two examples like this and both involve negation of *can.*

1	On this view pragmatics (at least in part) is about how, given a sentence uttered in a context, that context **plays a role in**	specifying what	proposition the sentence expresses on this occasion of utterance .
2	As with the (TMTSF)₂X salts, the structure of (BEDT-TTF)₂(ReO)₄ **may well be important in**	determining how	well it conducts electricity at low temperatures.
3	The answers to these questions **will help to**	determine what	decision should be reached.
4	The point is that whether descriptions are knowledge or behaviour oriented, type or token, they **cannot**	determine what	the teacher does. They have always to be referred to pedagogic decision.

Figure 8.18. 'Other' examples of [factor] + [determine] + *wh*

In summary, [factor] + [determine] + *wh* is a meaning frame which is used to posit a relationship of dependency between a 'factor' and a variable. As such, it represents a fairly specific meaning of DETERMINE, the verb found in the large majority of cases. Like the other meaning frames in this chapter, where it is associated with modal meaning, this tends to be with uncertainty.

8.5 Conclusion

This chapter has considered instances where the subject is inanimate and which did not therefore fit into the meaning frames described in Chapters 5 - 8. These are [evidence/test] + [show] + *wh,* [situation] + [explain] + *wh*, and [factor] + [determine] + *wh.* The investigation of the modal meanings that combine with these meaning

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frames has shown that these almost exclusively relate to uncertainty and that these instances of uncertainty only involve modal verbs. This finding is in line with Coates's (1983) observation of the association between inanimate subjects and epistemic meanings of modal verbs.

The next chapter will summarise the results and contributions of the study.

CHAPTER 9 – DISCUSSION AND CONCLUSIONS

9.1 Introduction

This chapter is divided into three main sections. The first of these summarises some of the main results to show how the research questions have been answered. The second part discusses the limitations of the study. The final concluding section will sum up the achievements of the study and the potential for future research.

9.2 Summary of Results and Contributions

The questions this thesis set out to answer were as follows:

- What can investigating **V wh** verbs as an attractor of modal meaning add to what is already known about the resources of modal meaning?

- That is, what main realizations of modal meaning beyond modals and semi-modals are attracted to **V wh** verbs?

- How are they related to modals and semi-modals?

- How does their investigation and description contribute to the phraseology of modality?

Since the answers to the research questions differ to some extent according to the type of modal meaning, the following summary and contributions section has been divided according to the modal meanings recognised in this study.

9.2.1 Overview of the resources of obligation

Table 9.1 presents the main means of expressing and referring to obligation seen in this study, which combines proposals such as Perkins (1983), Halliday (1994), Huddleston & Pullum (2002), Gabrielatos (2010), Hunston (2008, 2011) and Van linden (2012) and also includes some phraseologies identified in the course of the study, such as *a/the/one* ([first]) [step] BE *to*. It has been argued that these expression types overlap in terms of function with the modals and semi-modals, but also complement them by, for example, providing ways of reporting obligation. If we consider the cline from 'expressed' to 'reported' in Table 9.1, we can note the tendency of expressions towards the lower half to be used to report obligation (or make 'deontic statements' in Lyons's (1977) terms) while those further up are more likely to express obligation, with imperatives and imperative-like requests only expressing obligation. This distinction between reported and expressed is, moreover, typically only mentioned in passing in the literature (e.g. Lyons 1977, Gabrielatos 2010).

Table 9.1. Typology of expressions of obligation

Type	Main forms	
imperatives, imperative-likes	imperative, *let's* *Can/will you...?*	expressed
modals	*must, should*	
semi-modals	HAVE *to,* NEED *to,* BE *to, had/'d better*	
existential	*it* BE [important] *to* *it* BE *worth(while)* V-ing (*there* BE) *need* to *it* BE *time to* *a/the/one* ([first]) [step] BE *to*	
X ask Y to	X [ask] Y *to*	
X BE asked to	X BE [asked] *to*	
task BE to	*it* BE X's [task] *to* *it* BE *up to* X *to* *it* BE *left to* X *to* X HAVE [responsibility] *to*	reported

Table 9.1 contributes to the overall picture of obligation since previous studies have not considered all of these forms together in one place, and indeed corpus based work (e.g. Smith 2003; Collins 2009; Smith & Leech 2013, Lewis 2015) has only studied modal verbs and semi-modals. Therefore, we have not previously had comparative frequency information such as that provided in this study, either concerning particular types or more specific exponents. In this respect, one particularly striking finding is that the imperative occurs more frequently with **V wh** than modals and semi-modals of obligation in most meaning frames[1]. Indeed, this, together with the other frequency information, at least raises questions concerning

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[1] This raises the question of why it is not generally included in corpus-based studies of modality (e.g. Smith 2003; Millar 2009; Collins 2009; Lewis 2015). Such studies do not suggest why, but one possibility is the difficulty of retrieving imperatives automatically from a corpus, a problem noted by Zhang et al. (2008).

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arguments based on frequency in Smith & Leech (2013) and Lewis (2015) for focusing solely on modals and semi-modals.

An important part of this investigation, and a contribution to modality studies has been the exploration and description of certain phraseologies in terms of grammar patterns. If we consider the phraseology X [ask] Y *to*, which is based on the pattern **V n to-inf** (Francis et al. 1996), the usual approach to 'lexical modal' verbs such as ASK, REQUIRE and INVITE is either to include them in a list of verbs with (all kinds of) modal meaning (e.g. Perkins 1983, Quirk et al. 1985, Carter & McCarthy 2006), or to mention the verbs in some examples (Halliday & Matthiessen 2004). Such approaches do not necessarily draw attention to the relationship between the pattern and the meaning expressed by the verb (Hunston & Francis 2000). Considering X [ask] Y *to* as a phraseology in its own right made it possible to investigate which verbs express this meaning and establish their relative prevalence as well as that of the phraseology itself. A number of other verbs have been proposed to have this meaning, including ENCOURAGE, CALL *on* and SEND, the last of which is one of a group of verbs which refer to the delegation of jobs or tasks. This phraseology is typically quite infrequent, never accounting for more than 10.5% of the obligation instances of any meaning frame. At the same time it is of interest since it explicitly identifies the source of the obligation (X), whether the speaker (more rarely) or some other entity construed as having authority over the entity referred to by the 'Y' element.

From the perspective of identifying phraseologies of obligation and their typical exponents, then, the study can be seen as contributing to and describing the resources for expressing and reporting obligation in English.

However, perhaps a more important contribution in terms of the phraseology of modality is what this study has revealed about interactions between the resources of obligation and the different meaning frames. By considering the variability of the different types of expression, it is possible to see the preferred ways of expressing or referring to obligation, building on observations by Coates (1983), Collins (2009) and de Haan (2012) regarding typical co-occurrence features of modals and semi-modals of obligation. If we consider the picture at the broadest level as indicated in Figure 9.1, the fact that 'finding out', 'judging' and 'describing', all generally agentive meanings, are the meaning frames most associated with obligation broadly fits in with their observations.
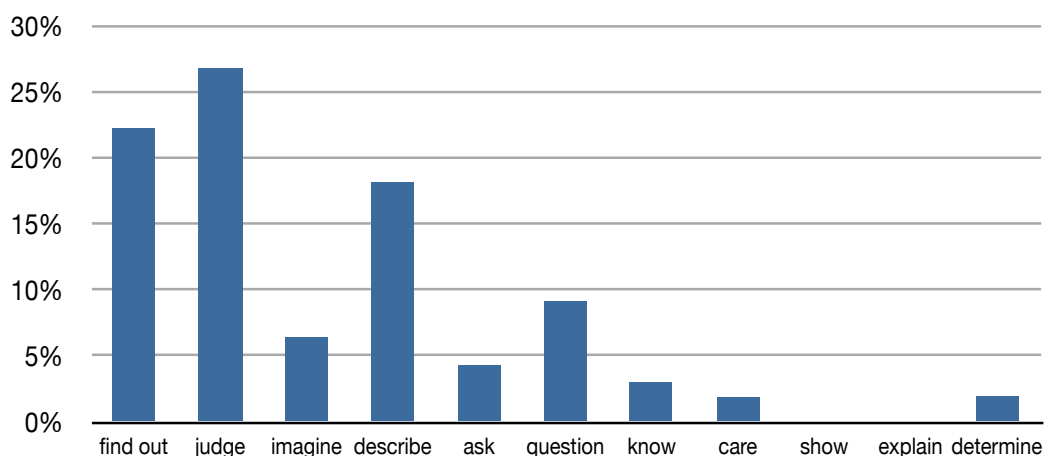
Figure 9.1. Proportions of instances involving expressions of obligation, by meaning frame

However, clearly this can only give a very coarse-grained idea of the variation across different meanings. At a more fine-grained level, the different resources vary quite considerably across the different meaning frames. For example, the meaning frame [thinker] + [imagine] + *wh* has a very strong preference for imperative forms (see Section 5.3.1) but avoids modal verbs expressing obligation. This is linked to the fact that the verbs involved participate in a relatively fixed phraseology, *(just) imagine/think/consider wh* where the *wh*-clause is not associated with a gap in information, but the answer is implicit. In such cases, the meaning of the imperative itself also changes; it is not associated with giving instructions or advice, as elsewhere, but is part of a fairly fixed phrase whose function seems to be to draw attention to the answer to the question.

(1)   Just *imagine how* hard it will be for Heathcliff when you marry Mr Edgar!

In contrast, if we consider a meaning frame such as [knowledge-seeker] + [find out] + *wh*, where all resources for expressing obligation are found, it is possible to see how different resources of obligation may fulfil similar functions. Examples (2)-(4) show 'finding out' instances where the addressee is given advice or instructions. We can see that, despite the range of verbs and different means of expressing the obligation, there is a certain regularity of meaning associated with the communicative function of giving instructions or advice, which is related to co-

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textual features such as subordinators that help specify the situation (*while...* in (2) *once...* in (3)), numerals suggesting one of a list of instructions as in (3) and more than one co-ordinated *wh*-clause, as in (2) and (4). It is also important to note that (4) includes present tense *is*; past tense *was* would change the meaning.

      (2)   While observing the respiratory rate **you should** *check whether*

                      both chest walls move equally and *whether* the accessory muscles of

                      respiration are being used.

      (3)   4. Once simple processes are found, *investigate whether*

                      conjugation will allow the processes to be moved to other pieces

      (4)   Obviously, **the very first thing is to** *discover what* societies

                      or bodies actually exist, and then to *find out who* the leaders are*.*

This kind of observation[1] suggests that the expressions of obligation involved are broadly comparable here (similar examples can be found with *you must/have to/need to* and *it is* [important] *to*). It also shows that there are restrictions such as the requirement for non-past instances of inflecting exponents and second person (including *one*) with modals and semi-modals. This is an example of how the phraseology of modality sits within the meaning frame.

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[1] While not strictly relevant to the aims of this thesis, it also suggests the hypothesis that certain expressions of obligation will cluster in such cases, yielding other expressions with similar functions. The sentences immediately following (4) in the BNC (B1P 228-232) include *it is probably wise to... it may be useful to...* and *it is, of course, vital to*

9.2.2 Overview of potential

If we turn now to the area of modal meaning covered by potential, similar points can be made to those relating to obligation. Firstly, the types shown in Table 9.2 are taken from a combination of sources – mainly Perkins (1983) and Hunston (2008, 2011) for forms apart from modals and BE *able to* – and include phraseologies identified in this study such as X MAKE *it* [possible] to. The forms shown here and others identified in the study present a fuller picture of resources in this area of meaning than is generally seen, including ways of referring to potential deriving from the situation (existential) as well as explicitly identifying the enabling factor ('enabling').

Table 9.2. Typology of expressions of potential

type	main forms
modal	*can, could*
able/ability	X (BE) [able] *to* X *have* [ability] *to* X FIND *it* [difficult] *to*
existential	*it* BE [difficult] *to* *it* TAKE *time to* [way] *to / of*
enabling	X [enable] Y (*to*) X MAKE *it* [possible] *to*

The contribution to phraseologies of modality can be seen in that many of the expressions in Table 9.2 are based on patterns from Francis et al. (1996, 1998), for

example, *it* BE [difficult] *to*, which is based on the pattern ***it* v-link Adj *to*-inf** (Francis et al. 1998). Perkins (1983) mentions the expression *it* BE *possible to* and Hunston (2011) notes the same main adjectives as found here: *possible, impossible, hard, easy* and *difficult* without specifying which is more prevalent. These five adjectives in fact account for almost all instances of *it* BE [difficult] *to* but also their frequencies vary by meaning frame. Moreover, the optional *for X* prepositional phrase usually mentioned in the literature when *it is possible for... to* is mentioned (e.g. Quirk et al. 1985, Halliday & Matthiessen 2004) was found to be extremely rare in this sample. This is a particularly significant phraseology in terms of frequency in that it rivals the modals of potential in most of the meaning frames; this comparative frequency information was not available previously, as corpus-based studies have only considered modals (e.g. Biber et al. 1999, Leech 2003) or modals and BE *able to* (Collins 2009). However, this is also an important phraseology from a different perspective since, unlike *can, could* and BE *able to*, it does not tie the ability or possibility to a particular subject referent but allows general reference to the situation.

As with obligation, it is important to consider the contribution to the phraseology of modality in terms of the associations between expressions of potential and particular meaning frames. Figure 9.2 shows the associations in terms of overall proportions between the different meaning frames and all expressions of potential. At this level it is not possible to draw any specific conclusions except that this broadly supports the idea first introduced by Coates

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(1983) but also noted by Biber et al. (1999) and Collins (2009) that, to an extent, agentivity is associated with this kind of meaning, although the more 'inert' (Leech 1987) 'knowing' verbs appear not to fit this pattern.
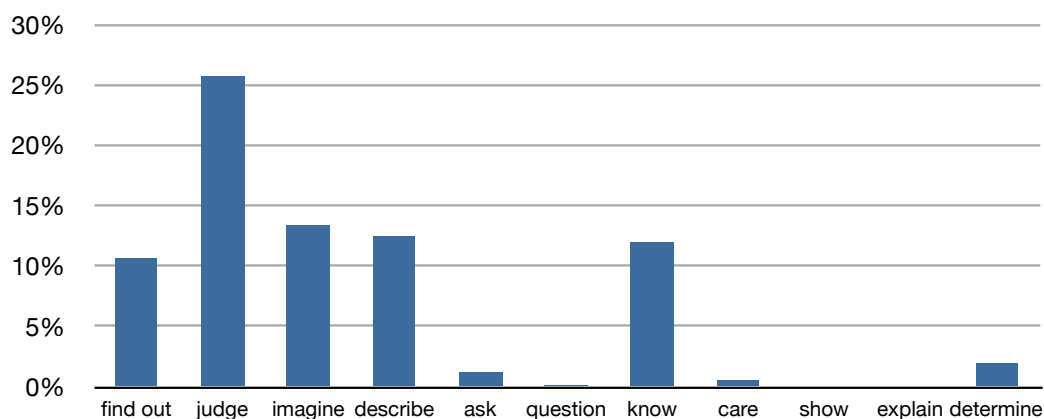
Figure 9.2. Proportions of instances involving expressions of potential, by meaning frame

At a more specific level, the variations in terms of the different ways of estimating potential are revealing, and show some of the advantages of this method. For example, while 'finding out' and 'knowing' verbs have similar overall proportions of instances of potential, (positive) modals and 'enabling' expressions are the two types with the highest proportions for 'finding out', while 'knowing' verbs are far more likely to occur with *can't/couldn't* and existential expressions of difficulty. These differences in distributions already go beyond the observations of Coates (1983), Biber et al. (1999) and Collins (2009) and are indicative of preferences in terms of particular meanings which can on closer investigation reveal more specific phraseologies.

One example of such a phraseology related to 'knowing' verbs might be summarised as 'expression of lack of potential' + 'verb of understanding' + 'rhetorical *wh*-clause'. An example is shown in (5).

(5)   'She was such a friendly, happy girl,' said her father... '**I just can't** *understand why* anybody would do this to her.'

This phraseology is restricted in terms of the verbs that occur (UNDERSTAND, SEE, APPRECIATE), the specific expressions of potential ('enabling' expressions are avoided[1]), and the *wh*-clauses that occur (there is a strong preference for 'rhetorical' *wh*-clauses, here indicated by the use of *anybody* rather than *somebody*). It selects personal pronouns, mainly first person, but also *it is* [difficult] *to* indicating speaker attitude. It is used to express an attitude of disbelief, frustration or annoyance towards a situation here emphasised by the use of *just*. The significance of this observation is that it again indicates how there are associations between particular verbs and modal meanings and exponents. It also shows how making finer distinctions within the meaning frame can lead to discoveries of this kind.

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[1] This might seem an obvious statement if one considers 'enabling' as only representing positive potential, but, while it is hardly found here, the negative, 'preventing' option X [prevent] Y from V-*ing* is in theory possible.

9.2.3 Overview of volition & purpose

The typology of expressions of volition and purpose in Table 9.3, which draws on Halliday 1994, Givon 2001, Huddleston & Pullum 2002, Hunston 2008, 2011, includes more different resources for expressing these meanings than is normally seen. This is in part due to the inclusion of expressions of purpose with volition/intention on the basis of evidence that these are related areas of meaning, particularly in terms of similarities between TRY *to* and ATTEMPT *to* and 'wanting' verbs. Hunston (2008, 2011) also notes a link between volition and these forms.

Table 9.3. Typology of expressions of volition and purpose

Type	Main forms
modals, semi-modals	*will, would, shall,* BE *going to*
be willing to	BE [willing] *to*
wanting	[want] *to* [aim] *to*
aim	[aim] BE *to*
trying	TRY *to* ATTEMPT *to*
purpose clause	*(in order) to* USE X *to*

As with potential and obligation, many of the phraseologies in Table 9.3 are based on grammar patterns. An example of how this approach extends previous

descriptions is 'wanting' verbs, which are based on the **V to-inf** pattern (Francis et al. 1996). As noted in Section 2.4.2, while WANT *to* is commonly noted as a means of expressing volition and sometimes as a semi-modal (e.g. Krug 2000, Collins 2009), other verbs of intention and volition[1] identified in this study are not, although they arguably have the same 'forward-projecting' feature (Givon 2001). Two fairly distinct groups have been noted, which associate with different subjects and, in turn, with different **V wh** verbs, indicating phraseological preferences. The first group, with *would/'d like* and WANT, prefers personal pronouns as subjects; in terms of 'finding out' verbs, they are associated with HEAR, SEE, CHECK, WORK OUT and LEARN. In contrast, verbs in the other group – AIM, SET *out*, WISH, SEEK, INTEND and HOPE – are more associated with third person and non-human subjects (e.g. *project*); the 'finding out' verbs they attract are ASCERTAIN, DISCOVER and INVESTIGATE. What is more significant about this observation is that it mirrors a similar distinction seen in terms of subject types and verbs for *will* and also largely differentiates between BE [willing] *to* (first group) and [aim] BE *to* (second group). This same pattern is broadly seen across three meaning frames, 'finding out', 'judging' and 'describing'. That is, expressions of volition are comparable with modals of volition in fairly specific situations.

As with expressions of potential and obligation, distribution changes in terms of specific types of expressions of volition can indicate phraseological preferences. An example of this is expressions of lack of volition and refusal, which are

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[1] including the fixed expression *would like to*

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generally rare with **V wh**, with the exception of the meaning frame [source] + [describe] + *wh.* That is, while it is unusual to refuse to investigate a question, it is quite common to refuse to reveal the answer to a question. As was shown in Section 6.2.3, this reveals a fairly fixed phraseology involving a person or organisation that refuses or is unwilling to reveal information that, by implication, is of general interest. The main exponents of the phraseology are shown in Figure 9.3. Once again, this shows how the resources of a particular modal meaning, volition, are associated with a particular environment to create a specific meaning, and how the notion of the meaning frame helped in its identification.

	BE *reluctant/unwilling/loath to*	
X	REFUSE/DECLINE *to*	*discuss/specify/reveal/say wh*
	will not / would not	

Figure 9.3. Phraseology X [refuse] + [reveal] + *wh*

It is important to discuss the status of expressions of purpose at this point. As noted in Section 2.4.2, there is support in the literature (Givon 2001, Hunston 2011) for considering the expression of purpose as a modal meaning, since, in saying that an action is being carried out for a particular purpose gives no guarantee that it will succeed, lending it an air of uncertainty. As noted above, there is some overlap between volition and purpose. However, the phraseologies around 'trying' verbs, particularly when they are in progressive forms, are somewhat different from verbs

of volition and from the modal *will*; this, together with their suggestion of effort (and therefore difficulty) seems to place them somewhere between volition and potential. In short, expressions of 'trying' conform to Depraetere & Reed's (2006: 269) characterisation of modality as 'not represent[ing] straightforward facts'.

Purpose clauses, meanwhile, have a range of phraseologies that differ by meaning frame (e.g. [conduct] [analysis] *to* [find out] + *wh*, examples of which are seen in (6) and (7) below), but which seem even less associated with volition meanings of *will* than TRY *to*. A further question with purpose clauses could be whether *all* expressions of purpose in purpose clauses are modal, or just those that combine with main clauses that themselves include a modal marker, such as (6) below. Where we have past tense main clauses, such as (7), there is an implication that the 'determining' has been carried out and the results are available. This begs the question of why the results are not provided here (i.e. by using a *that*-clause). The possibility of paraphrase using [aim] BE *to* (*the aim in calculating the F-ratio was to determine whether ...*) shows the link with volition.

(6) their responses to questions on these games **will** be analyzed to *ascertain whether* comparisons were made and affected their self-evaluations.

(7) The F-ratio was calculated in order to *determine whether* any of the conditions showed a significant difference from the others.

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That is, while expressions of purpose are, I would argue, associated with modal meaning, they are not necessarily relatable to the volition meaning of *will*. To the extent that modal verbs are seen as central to modal meaning, this could be seen as a problem. However, purpose is not the only area of modal meaning not greatly associated with modal verbs; a similar situation is seen in evidential modality in English, represented by items such as *according to* (Stubbs 1986, 1996) which are also tangentially related to modal verbs.

9.2.4 Overview of uncertainty

The different ways of expressing and reporting others' uncertainty which have been considered in this study are shown in Table 9.4. This is a wide range of expressions in that it includes *yes-no* questions (Lyons 1977, Perkins 1983, Quirk et al. 1985, Chafe 1995, Huddleston & Pullum 2002, Gabrielatos 2010) and conditional *if*-clauses (Perkins 1983, Palmer 1990, Bybee et al. 1994).

Table 9.4. Typology of expressions of uncertainty

Type	Main forms
modals, semi-modals	*will, would, may, might, must*
adverbs	*probably, perhaps*
projection	[think] (*that*)
conditional	*if, unless*
***yes-no* question**	*Have you …?*
other	SEEM *to*, [not know] *if/whether*

This area of modal meaning is perhaps not as amenable to the types of descriptions that have proved quite successful with other areas of modal meaning and is generally less productive in terms of its associations with **V wh**. The only pattern that occurs in more than a few instances, **V that**, is already well-known as a modal marker (Perkins 1983, Halliday 1994, Aijmer 2002, Huddleston & Pullum 2002, Carter & McCarthy 2006, de Haan 2006). In any case, as a subordinator, it is less obviously comparable with modal verbs; *if*-conditionals and *yes-no* questions create similar issues. Other possibilities that might have been more comparable with modal verbs of uncertainty, such as BE *likely/probable to* only occurred very infrequently, if at all. Another way in which expressions of uncertainty are exceptional is that they combine, or 'harmonise' in some cases (e.g. *I think* he *will*), a feature not seen with other modal meanings.

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Nevertheless, there are some observations that can be made about the distributions shown in Figure 9.4 for the different meaning frames. Firstly, uncertainty is most obviously identifiable where other types of modal meaning are less prevalent, that is, where subject-referents are not in control of the action because of the 'inert' meaning of the verb (Leech 1987), for [knower] + [know] + *wh* and [carer] + [care] + *wh*, or because they are inanimate. This distribution therefore tends to support Coates (1983), Biber et al. (1999) and Collins (2009) who associate these features with epistemic meanings.
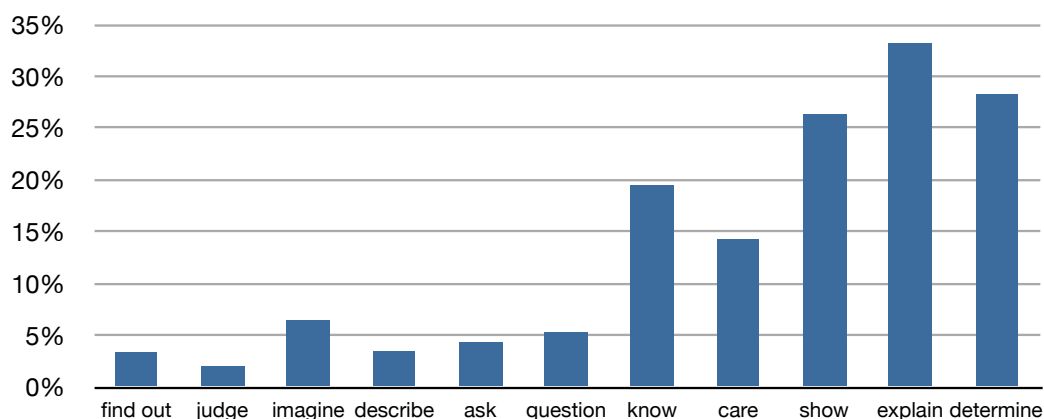
Figure 9.4. Proportions of instances involving expressions of potential, by meaning frame

Secondly, while, in the case of 'showing', 'explaining' and 'determining', nearly all instances involve modal verbs, with 'knowing' and 'caring' instances, modals are not the most frequent means of expressing uncertainty but one amongst several different possibilities. A final point of interest which is seen at a finer level than

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Figure 9.4 is the difference between, on the one hand, 'showing' and 'determining', which associate with *will* and 'explaining', which prefers modal verbs of weaker certainty. This indicates a phraseological preference.

9.2.5 The phraseologies of modality and the meaning frame

What the discussion in Sections 9.2.1-9.2.4 has tried to show is that the phraseology of modality can be seen on two different levels: individual phraseologies and those considered in the context of a meaning frame.

Firstly, it may be possible to view the phraseology of modality in terms of variable phraseologies such as *it* BE [important] *to* or more fixed ones such as *it* BE *up to* X *to* that are associated with modal meaning and that may be itemised and investigated in their own right or in comparison with other modal markers. This thesis might be seen as an (incomplete) inventory of such expressions. From this perspective, one of the main contributions that this study makes is to identify and describe a range of such phraseologies, many of which build on patterns in Francis et al. (1996, 1998) and Hunston & Francis (2000) and extend what is typically presented in the modality literature. Particularly in the areas of obligation, potential and volition, these can be seen to overlap with and complement the meanings expressed by modal verbs.

This approach, as we have seen, follows a qualitative procedure followed in much corpus work – examples include Francis (1993) in the area of patterns,

Stefanowitsch & Gries (2003) in the area of constructions and Marco (2000) for collocational frameworks – but seen less often in the area of modal meaning (Hunston (2008, 2011), Van linden & Verstraete and Van linden (2012). It works by grouping individual verbs, adjectives and nouns into modal expressions based on their occurrence in grammar patterns identified in the concordance lines. Individually, such items may not be very frequent, and indeed Smith & Leech (2013) provide an example, (BE) *essential*, which they do not consider for this reason. As an individual lexical item, *essential* is indeed infrequent, but as part of the phraseology *it* BE [important] *to*, it accounts for a much larger number of instances. It is then possible to say which items are most frequent and suggest finer distinctions, such as between weaker necessity (*better, wise*) and stronger (*essential, necessary*), the extent to which BE is free to inflect, which modal verbs occur (e.g. *it may be important to, it would be better to*) and so on.

Furthermore, from a practical perspective, taking a pattern approach to more lexical expressions of modality suggests a means of composing corpus queries that could retrieve those expressions from a suitably tagged corpus and allow studies like Smith & Leech (2013) to include them in their diachronic comparisons of modal forms. These insights could also inform studies such as Rubinstein et al. (2013), who use similar patterns as part of a project to annotate a corpus for modality.

At a second level, we could see the phraseology of modality in terms of modal meaning in association with a particular 'attractor', the **V wh** pattern. This

has shown in a way not attempted before on this scale, but suggested by the work of Hunston (2000, 2008, 2011) the importance of considering particular modal exponents and expressions in terms of the types of items they are associated with, realised in this study in the form of the meaning frame. An appreciation of these associations is not generally seen in the literature, although it is suggested by Coates (1983), Biber et al. (1999), Hunston (2000), Collins (2009) and de Haan (2012) all of whom pay some attention to co-occurrence features in the context of modals and semi-modals.

This thesis has brought into focus the importance of the meanings of verbs, as well as subject type as further variables (complementary to, for example register, genre, variety) that can be taken into account when investigating modal meaning. That is, as has been shown in Chapters 4-8, these modal meanings and more specific modal exponents are associated with different groups of verbs to different extents and the investigation of these can reveal the preferred ways of saying particular things (Gledhill 2000).

The concept of the meaning frame has the potential to address the phraseology of modality at a number of levels, which is where its power as a notion derives. This is because it is possible to make progressively finer distinctions in terms of associations and exponents. At a coarse-grained level, it has been shown that proportions of instances associated with particular modal meanings vary according to meaning. At a finer level particular types of modal expression are associated to differing degrees with different meaning frames. At the finest level,

we have seen that more specific groups of verbs are associated with particular exponents and often, more specific subject types, as well as other preferences and restrictions such as *wh*-clause type and tense. At this level phraseologies emerge that demonstrate Sinclair's (1991) idiom principle and indicate that choices in terms of the resources available to express particular modal meanings are more restricted than the modality literature has previously noted. The main implication of this type of finding for other studies of modality is that studies that talk of 'competition' between different modal exponents (Close & Aarts 2010) may want to consider typical environments to a greater extent.

9.3 Limitations of the study

Before concluding the thesis and recommending further work, it is important to mention some key limitations of this study and how they might be addressed.

9.3.1 Corpus composition

One limitation related to this study is the age of the BNC and its resultant composition in terms of text types and registers. Clearly, a corpus developed in the early 1990s cannot include newer text types and means of communication that have become prevalent since then. A particularly relevant area here is that of

online discourse and e-language (Knight et al. 2014); the BNC contains some early emails, but these are all from one mailing list and only represent a very small proportion of the corpus (around 0.2%). This puts into question Hanks' (2013) claim that the BNC is representative of modern English, particularly in view of recent findings on changes in modal language (e.g. Leech 2003, Smith 2003), and Biber's (2015) argument that not just conversation, but other registers, such as academic prose are susceptible to fairly rapid change. The clear implication of this limitation is that research should be carried out on a corpus that contains these newer text types; one candidate would be the Cambridge and Nottingham e-Language corpus (CANELC) described in Knight et al. (2014).

9.3.2 Considerations of context: genre, register, mode

This study has aimed to show the main resources for expressing modal meaning in a general English corpus, the BNC, in the tradition of lexical grammar work such as Sinclair (1991), Francis et al. (1996) and Hanks (in progress). However, a key limitation of this approach is that, in pursuing variation in the distributions of modal meanings and forms according to meanings of verbs, this study has not focused on variation in terms of context. Thus, it cannot be said which register, genre or mode (speaking vs. writing) particular modal meanings or expressions are more likely to occur in. Numerous studies (e.g. Biber et al. 1999, Biber 2004, Carter & McCarthy

2006) have shown that contextual variables of this kind have an effect on language use. It has not been possible within the scope of this study to look at these or to discuss the extent to which the modal expressions that have been identified might be associated with particular registers, genres or modes but these are clearly important questions.

9.3.3 Limitations of the methodology: subjectivity

The notion of the meaning frame was developed in order to address the issue of how to group **V wh** verbs according to meanings. Mostly this is (and is often acknowledged to be) a relatively *ad hoc* process, either relying on the intuited core meaning of the verb (Karttunen 1977; Trotta 2000; Huddleston & Pullum 2002) to the exclusion of other possible senses, or, as in Francis et al. (1996) an intuitive process (Hunston & Francis 1998), which is informed to some extent by the senses listed in the CCED (Hunston, personal communication). This thesis has attempted to make explicit the ways in which the meaning frames were formulated and the decisions which led to the inclusion of particular verbs in particular frames. However, any qualitative analysis carried out by one analyst will be subjective and liable to bias towards the particular knowledge and preferences of that analyst (Groom 2007, Barlow 2011, Hanks 2013). This may affect the identification of both modal expressions and the composition of meaning frames.

In terms of the identification of meaning frames, once one moves beyond surface collocations, subject types are already at an increased level of abstraction and therefore their grouping (e.g. in terms of names, institutions, pronouns) involves a degree of subjectivity, which is increased when hypotheses are made about the roles they play with regard to the meanings of verbs and *wh*-clauses, that is, as, for example, [source] or [decider].

Similar points apply to the categorisation of modal verbs and expressions into different groups. The large number of different models of modality and their theoretical bases, some of which were discussed in Chapter 2, indicate the difficulties encountered in this area; as we saw there, even those who broadly agree about the main categories of modality analyze apparently similar examples in different ways, making the results of studies of modality hard to compare. This was the reason for taking a broad view of modal meaning rather than trying to distinguish, for example between ability and possibility or between obligation and necessity. Nevertheless, there is no particular reason to believe that this study is less subject to this kind of issue than any other.

Moreover, the identification and grouping of items with similar meanings and patterns is a reliability issue that also impacts this study. That is, the verbs that have been included in, for example, X [ask] Y *to* would not perhaps receive the same analysis from a different analyst; this is why they have all been listed. This is an issue seen in a wide range of corpus studies (Groom 2007, Sharoff 2010, Barlow 2011).

All of these points relate to the question of the replicability of this kind of work or in corpus work in general. Barlow (2011) emphasises this general problem, and Groom (2007) calls the notion of replicability a 'chimera' due to the sheer number of variables involved. Nevertheless, the clear implication for this study is that the impact of subjective analyses can be seen in a number of areas and that therefore some kind of intersubjective agreement (Popper 2002) would provide some check on this. This could be achieved by carrying out inter-rater reliability testing on a portion of the data, a process I was unable to carry out due to lack of resources. This process could ensure greater consistency and identify potential areas where the distinctions made are not as clear as they could be.

Another possibility in terms of grouping the instances into meaning frames would be to perform a cluster analysis similar to Divjak (2006) and Divjak & Gries (2006). This approach involves coding 'each ... instance in terms of ... morphosyntactic, syntactic and semantic characteristics that form a verb's behavioral profile' (Divjak & Gries 2006: 23) and grouping the instances into clusters represented on a dendrogram. The scale of the kind of work outlined by Divjak & Gries (2006) – the coding for just nine verbs in terms of the 87 variables identified created 137,895 data points – put it beyond the scope of this study. It should be noted, moreover, that, despite Divjak & Gries's (2006: 28) claims to 'making the analytic process as *objective* as possible' (emphasis as in original) and hence to replicability, their approach does not remove the element of subjectivity since semantic decisions are still involved such as between animate and non-

animate subjects and between 'addressable, i.e. human, and non-addressable or animal animate subjects' as well as tests regarding whether verbs can be imperative or not.

It could also be added that the limitations imposed by this being the work of one analyst and the labour-intensive procedure of sorting instances can also be seen in terms of the number of verbs covered. It seems possible that the investigation of further verbs which were excluded on the grounds of frequency in the BNC could lead to further meaning frames or adaptations to the ones proposed in this study.

9.3.4 Limitations of the methodology: the meaning frame and uncertainty

Seen as way of conducting 'prolonged fieldwork' (Stubbs 1986, 1996) into modal expressions, in part based on their syntactic affinity with modals, the use of meaning frames is an approach that works well for the expression of obligation, volition and potential. This is because, as noted by Hunston (2011), many of the modal expressions identified involve either *to*-infinitives or prepositions and so they immediately precede the verb or, in the case of imperatives, they are a verb form.

However, there are some question marks regarding the expression of uncertainty. This is because, with the exception of modal verbs and SEEM *to*, the means of expressing uncertainty are syntactically/grammatically more diverse. This area of modal meaning also creates some difficulties which are not commonly

acknowledged in the literature but which became apparent in the course of the analysis carried out in this study. The problem is that expressions of uncertainty can combine with expressions of other types of modal meaning[1], leaving the analyst with the question of which meaning to prioritise. The decision taken in this study was to focus on the item closest to the verb, but also to try to account for expressions of uncertainty in combination with other meanings.

9.3.5 Use of frequency information

An important point needs to be made regarding how the descriptive statistics were calculated and some of the issues arising from this methodology. As noted in Chapter 3, the syncretism of *wh*-words in 'surface' instances of **V wh** retrieved from the BNC necessitated the use of a sampling process to keep the numbers of concordance lines to be analysed to a manageable level. The result of this was that frequently occurring **V wh** verbs such as KNOW and SEE were under-represented in terms of raw sample frequencies. In order to correct for this under-representation, extrapolations based on sample proportions have been used in reporting frequencies (the method of calculation is described in Section 3.4.5), in the awareness that these can only be approximations. Since the reliability of findings or extrapolations made on this basis is likely to correlate with the overall frequency of verbs in the corpus (Hoffman et al. 2008), this means that findings for very frequent

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[1] the same is true of obligation but not to the same extent. One can be uncertain regarding an obligation, but not the other way round (Nuyts 2005).

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verbs such as KNOW are less likely to be robust. This suggests that further research could be carried out on samples of verbs such as KNOW and SEE, perhaps in the manner suggested by Groom (2007), that is, by examining several samples independently to measure the variability across samples and thereby estimate the ideal sample size.

The final limitation is that, in terms of modal exponents, there is no guarantee that those that are found frequently with **V wh** are also frequent in other environments, nor vice versa. We could note, for example of lack of obligation, which might be expressed with a range of forms including *not* HAVE/NEED *to*, *there* BE *no need to* and *it* BE *unnecessary to*, is particularly infrequently found with **V wh**. This does not mean that this is generally infrequent in English, although this would be an interesting question to consider and not one that seems to have been investigated before. There is also the example of BE *going to*, which Biber et al. (1999) and Collins (2009) find to be one of the most frequent semi-modals (see Figure 2.2) but again is infrequently found here. This suggests that further research could investigate the typical environments of particular modal expressions, for example by carrying out collostruction analysis (Stefanowitsch & Gries 2003) for such items to investigate which verbs or verb patterns are particularly associated with them. Indeed it is one of the arguments of this thesis that this type of work is important.

9.4 Conclusion

The aim set out at the beginning of this thesis was to investigate what an approach inspired by lexical grammar might bring to the study and description of modality. This took Hunston's (2011) hypothesis that the **V wh** pattern is an attractor of modal meaning to examine what the investigation and description of what is attracted can add to our knowledge of the resources used to express modal meaning in English and explore what a phraseology of modality might look like.

I believe these aims have been met in three main ways.

Firstly, the consideration of the resources in four main areas of modal meaning – obligation, potential, volition/purpose and uncertainty – in particular the first three of these, has shown how modals and semi-modals, the focus of much previous research, are just one among many resources for these meanings. Moreover, as the first corpus study to include all of these resources, it has been possible to obtain frequency data – for this pattern – that suggests that the view that modals and semi-modals are the most frequent means of expressing certain modal meanings (Smith & Leech 2013, Lewis 2015) is open to question.

Secondly, the means of investigation and description has proposed a series of phraseologies largely building on the descriptions of pattern grammar (Francis et al. 1996). These phraseologies combine both grammatical and lexical information by showing how certain patterns attract words to express certain modal meanings.

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This is an advance firstly because it offers an alternative to the tendency of previous corpus-based approaches either to dismiss as too infrequent (e.g. Smith & Leech 2013) or simply not consider (Millar 2009, Collins 2009) the lexical resources of modality. It also presents a step towards a modal grammar of English by drawing attention to the particular patterns that are typically used to express particular meanings as well as their most common exponents. Moreover, the patterns presented suggest how these resources may be retrieved from a corpus.

Thirdly, it has introduced the notion of the meaning frame, which builds on lexical grammar work such as Hanks (2013) and Francis et al. (1996) in order to investigate how modal meanings and exponents vary in their associations with groups of verbs of different meanings. The meaning frame is a flexible notion and can work at a number of levels, the finest of which identifies fairly specific phraseologies with particular functions and associated preferences. This builds on Coates (1983), Biber et al. (1999), Collins (2009) and de Haan (2012) in showing the importance of considering co-occurrence features when investigating modal meaning.

The final section will discuss future research directions and the implications of these findings.

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9.4.1 Future research implications

This section will outline some possible further work that could be done in this area and implications for other studies of modal meaning.

It has only been possible to cover a relatively small number of **V wh** verbs in the course of this study, so one future research option would be to look at those verbs which were not frequent enough to be included in this study. It seems possible that their investigation could add to the picture in various ways, but particularly where meaning frames are at present rather small either in terms of verbs or instances or both. This follow-up investigation could employ one or more of the research methods mentioned in Section 9.3, for example the cluster analysis techniques of Divjak & Gries (2006), which might suggest adaptations to the groupings proposed in this study.

An important area of investigation would be conduct similar research on a narrower area, such as a specific register, for example academic prose, conversation or e-language, or a specific genre. Investigation of a more specific corpus would make it possible to see how the resources for modal meanings identified here are exploited in that area and give an idea of what is preferred in a particular social situation or discourse, leading to more accurate and useful descriptions. It is possible that further means could be identified or that those that have been less prominent in this study would prove to be more important in more

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specific corpora. Such research could also investigate how factors such as mode (spoken vs. written communication), or relationships between producers and receivers of language affect the choices made in terms of types of exponent. For example, it could consider when are imperatives used, with what verbs and whether they might be preferred (or not) compared to other obligation resources based on these factors.

A further way in which research in the area of modal expressions could be extended would be to investigate these in terms of their associations with other potential attractors of modal meaning. Based on similarities with the **V wh** pattern, it might therefore be interesting to consider, for example, either the similar pattern **V n wh** or **V wh** verbs followed by 'concealed' questions (Huddleston & Pullum 2002: 976), where a noun is used instead of the *wh*-clause but with a similar meaning (their example is *Can you tell me the time?* which involves a modal verb). In terms of contrast with the **V wh** pattern, a suitable candidate might be verbs with *that*-clause complementation, **V that**, particularly as a number of verbs are in both patterns. Biber et al. (1999: 490) also note a number of verbs that 'occur predominantly with modals' and which could be considered as candidates as attractors of modal meaning on this basis.

Taking a different perspective, one could undertake research into one or more of the modal expressions identified and investigate their associations, for example, by means of collostruction analysis (Stefanowitsch & Gries 2003) for individual phraseologies, or distinctive collexeme analysis (Gries & Stefanowitsch

2004) for comparisons of apparently similar items, to the extent that the phraseologies are compatible with a description in terms of constructions. Because the expressions seen in this study have only been studied in association with **V wh** it is important to know their general prevalence and what other verbs, patterns and subject types they are associated with.

There also seem clear implications for studies that compare modal uses in learner corpora of speakers of different languages (e.g. Carrió-Pastor 2014) or native and non-native writers or speakers (Hinkel 2009). Both of these studies only compare the use of modal verbs, but it seems important also to consider other resources of modal meaning such as those identified in this study. Aijmer (2002), for example, focusing mainly on epistemic resources, finds that non-native writers use modals more often than native speakers perhaps due to the wider repertoire of expressions that native speakers employ. But research in other areas of modal meaning does not seem to have been carried out, although it seems to have potential practical implications for teaching and learning (Hunston 2011) in indicating where language learners may lack the resources they need.

The other area of interest is that of corpus based diachronic studies of modal markers, which is quite an active field, including Leech (2003), Smith (2003), Millar (2009), Close & Aarts (2010), Leech (2011) and Smith & Leech (2013). All of these studies investigate changes in frequencies of modal verbs and semi-modals over time, with some conflicting results. None of these studies seeks to investigate other related phenomena such as the modal expressions identified in this study.

Smith (2003: 250) finds a gap between the decline in the frequencies of modals of strong obligation and an increase in comparable semi-modals, noting that one of the factors that could explain this is that 'non-auxiliary expressions of modality (e.g. *it is essential that...*) may be coming to the fore'. However, this line of enquiry does not seem to have been pursued, perhaps, as noted in Section 9.2.5, because studies of this kind tend to consider the more lexical resources of modality in isolation from each other. The grammar pattern approach to phraseologies of modality offers a way to conduct research of this kind and address hypotheses like that posed by Smith (2003).

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