# A semiotic approach to grammaticalization: modelling representational and interpersonal modality expressed by verbonominal patterns

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## Abstract

This paper develops a framework capable of analysing modal qualifications coded by both canonical modal markers and grammaticalized expressions within a semiotic grammar approach (McGregor 1997). We focus on grammatical constructions that developed from complement constructions containing the shell nouns *need*, *way*, *chance*, *doubt*, *question* and *wonder*, often preceded by a negative quantifier. We range the different types of modal qualification in a hierarchy. The top half subsumes mirativity and epistemic modality, which scope over propositions, and interpersonal deontic modality, which scopes over processes. The bottom half contains representational deontic and dynamic modality, which are internal to the proposition. We also address the neglected issue of the presence of polarity choices in the modal qualifications and in the propositions and processes. In particular, we argue that epistemic modality ascribes inherently positive degrees of likelihood to either positive or negative propositions, thus assessing the probability of occurrence versus non-occurrence of temporally located processes. This allows us to explain not only the semantic equivalence involved in NEG-raising, as in *I think he did nothing wrong* and *I don't think he did anything wrong*, but also, more broadly, between pairs like *there's no chance she will cry* and *there's no doubt she will not cry*. Finally, the proposed semantic model puts us in a position to propose structural analyses of the interpersonal and representational qualifications of propositions and processes within the broad outlines of McGregor's (1997) Semiotic Grammar.

## 1. Introduction

The aim of this article is to develop a framework to analyse modal meanings coded by signs resulting from grammaticalization within what can broadly be called a 'semiotic grammar' approach (McGregor 1997). Theoretically, our approach is eclectic, combining elements from cognitive grammar (Langacker 1987, 1991, 2005, 2017, 2021) and from functional grammars (Halliday 1967a,b, 1994, Halliday & Matthiessen 2004, McGregor 1997). Within these approaches, we highlight the shared commitment to the tenet that grammatical structure codes semantic structure in a natural, language-specific way.

The aim of developing a framework for analysing modality expressed by grammaticalized signs targets what we perceive as relatively underdeveloped areas in the grammaticalization literature. From the semantic end, the analysis is sometimes rather vague regarding issues like the difference between epistemic, deontic and dynamic modality and the semantic units they scope over, or the interaction

between modality and polarity. From the grammatical end, there is a similar lack of precision regarding the structural assembly of the new signs.

Lack of *semantic* precision can be illustrated with Davidse & De Wolf's (2012) study of the modal meanings developed by strings like *make question*, *there be a question*, etc., which constitute a subset of the verbonominal expressions this article focuses on. Example (1) illustrates a lexical use of *make question*, which means 'ask' and can only take reported questions as complement. In (2) *I make no question* functions as a modal marker, expressing the speaker's epistemic assessment of the proposition 'the tower will stand' as potentially highly likely, if a specific condition had been fulfilled (*had they found a linguist half so good*). In (3) *there is no question of* can be interpreted as conveying either impossibility, i.e. dynamic modality (with the fallen horse surrounded by traffic one cannot first debate how he came to fall) or absence of permission, i.e. deontic modality (pity with the overworked horse forbids debating before getting him up).

(1)   ***thei mad question*** to what entent thei schuld rise, ... (PPCME, 1420–1500)[1]
(2)   For had they found a linguist half so good
      ***I make no question*** but the tower had stood. (CLMETEV, 1710–1780)
(3)   When in the streets of London a Cab Horse, weary or careless or stupid, trips and falls and lies stretched out in the midst of the traffic ***there is no question*** of debating how he came to stumble before we try to get him on his legs again. (CLMETEV, 1850–1920)

However, the analysis of (2) and (3) by Davidse & De Wolf (2012) did not go into more specific semantic issues that this study wants to address more properly. In what sense are or aren't epistemic, deontic and dynamic modality speaker-related? What semantic units do these different types of modality scope over? There is, for instance, a fair consensus that epistemic modals have propositions in their scope, but how precisely do we define 'propositions'? How does polarity fit into the systems of epistemic, deontic and dynamic modality and into the semantic units they apply to?

Precise *structural* analyses of grammaticalized expressions are a particular challenge. McGregor (1994: 308) has criticized the reduction in some grammaticalization studies of "a full syntagmatic construction" to "simply the string of words", by which he means the "mere linear contiguity" (McGregor 1997: 47) of elements of grammatical classes. In the context of grammaticalization studies, it is often not immediately obvious how one can get around using the names of the grammatical classes to relate the lexical to the grammaticalized uses. For instance, the term 'binominal' is often used to refer to examples like both (4) and (5). Even when it is recognized that in an example like (4) the lexical head noun is *lot* while in an example like (5) it is *trees*, the class-based notation may still be used to represent these different structures, e.g. [NP1 [*of* NP2]] for (4) and [[NP1 *of*] NP2] for (5) as proposed by Trousdale (2012: 177).

(4)   Rayburn parked the sport-utility vehicle on the lot of a store in the vicinity (WB)
(5)   there're a lot of trees … separating the two places (WB)

In this case, we argue that it is hard to maintain a [[NP1 *of*] NP2] analysis for *a lot of trees* in (5). *Lot* has lost most of its nominal features and has become part of a new sign whose expression is *alotta* and whose denotatum is a relational notion of size (not an entity). *Trees* is the head designating the type of things referred to, not a full NP (Brems 2003, 2011, 2012). On the tenets of a semiotic grammar, the structure is meant to capture the precise way in which the units combine to provide the necessary information for semantic computation. "Structures … and functions … are not distinct but represent alternate perspectives on the *same assemblies* [our italics]" (Langacker 2021: 9). Thus, the structural assembly posited for *a lot of trees* will have to capture the specific way in which language users relate *alotta* to *trees* such that *trees* is processed as the type of 'things' involved and *alotta* as measuring the size of the specific instantiation referred to, i.e. as a quantifier. Crucially, this assembly treats *a lot of*

*trees* as one NP with a quantifier - head structure, and no longer as a 'binominal' or '[[NP1 *of*] NP2] structure' (Brems 2003, 2011, 2012).

With examples (1), (2) and (3) the situation is more complex. The primary constituents of these examples tend to be referred to not by terms for grammatical classes, but by intrinsically functional-structural notions, such as 'complement-taking predicates' (CTPs) and complements. As explicitly discussed by Boye & Harder (2007: 568), Langacker's (1987: 277f) conceptually motivated definition of complementation applies to the relation between *they made question* and the reported question in (1): the meaning of the head makes schematic reference to a complement which it has to be elaborated by to yield a complete representation that can stand on its own. The complement-taking predicate imposes its semantic profile on the whole construction: (1) describes an instance of 'asking a question'.

Example (2), in which *I make no question* conveys modal meaning, is generally recognized to involve a different combination of the two clauses than in (1). Following Boye & Harder (2007, 2012), we interpret this different combination as a shift from discourse primary to discourse secondary status of the erstwhile matrix. Discourse primary status is coded and can therefore be picked up by tests such as the possibility of 'addressing' the clause as the main point of the utterance. In (2) *I make no question* is not 'addressable', as shown by the non-acceptability of 'Really? Do you make no question?' versus the acceptability of 'Really? Had the tower still stood if they had found a linguist half as good?'. Boye & Harder (2007: 586) point out that "[o]ne of the consequences of the codification of secondary status is that the CTP loses the semantic capacity to impose its profile on the complement clause, whose profile therefore overrides that of the CTP […]. In Langacker's (1987: 309) terms the lack of this semantic capacity is the defining criterion for 'modifying' as opposed to 'complementizing' status." Boye & Harder (ibid.) therefore tentatively propose to view CTP-clauses coding modal meaning as in (2) as modifiers, more specifically as adverbial clauses. "Like adverbs, adverbial CTP clauses (i.e. CTP clauses involving grammatical CTPs) serve a modifying function in relation to the (complement) clause they are attached to" (Boye & Harder ibid.). This proposal is 'semiotically' motivated, as it seeks to correlate the structural with the functional. However, as illustrated by the quotes, to safeguard intelligibility, Boye & Harder (2007, 2012) keep the conventional terms "CTP" and "complement" to refer to the units of the grammaticalized examples.

Further issues are raised by example (3), where *there was no question of debating* conveys dynamic (impossibility) or deontic (absence of permission) modality. With this example we cannot test for coded secondariness in any straightforward way, as the non-finite gerund cannot be used in a *really*-probe – *\*Really? Debating?* Does this mean then that we do not have grammaticalization here even though modal meanings are conveyed? Or do we have grammaticalization but without form-meaning isomorphism? Our answer is that we do have grammaticalization, but *there is no question* in (3) codes modal meaning of the 'objective' (non-speaker-related) type (Verstraete 2001). This type of modality is part of the proposition, as it is in counterparts of (3) with canonical modals like *One could not* ('one was not able/allowed to') *debate […].* Therefore, objective modality cannot be brought out by addressability tests such as the *really*-probe.

Obviously, the semantic difference between speaker-related and objective modality needs to be accounted for in our semantic model. At the same time, we want to capture the distinct structural coding of speaker-related and objective modality — both by canonical modals and signs resulting from grammaticalization. We will propose an analysis of the two types of modality in terms of McGregor's (1997) distinction between representational and interpersonal structures. Objective modals and their lexical processes are coded by representational structures, in which the elements of structure are added to each other to provide a more complete description. Speaker-related modals and the propositions or processes they scope over are coded by interpersonal structures, in which an interpersonal modifier changes the representational material in their scope.

## 2. Data and research questions

For this goal, we need a focus of description that provides us with both the necessary semantic range and structural variety. As the case study to build up and test our model we take a set of structures that, except for a few studies, have remained largely under the radar, viz. structures containing "shell nouns" like *chance*, *doubt*, *question*, *need*, *way* and *wonder*, i.e. abstract nouns that "characteriz[e] and perspectiviz[e] complex chunks of information" (Schmid 2000: 14). A specific feature of these

grammaticalization paths is that the shell nouns are often preceded by a negative quantifier such as *no, little, not ... any* (henceforth *'no'*) in the grammatical uses. The modal meanings developed by these expressions have been studied by Kjellmer (1998) for *there is no question that/of*, by Simon-Vandenbergen (2007) for *there is/have no doubt that*, and Loureiro-Porto (2010) for verbonominal patterns such as *there is/have (no) need to*. In this article we will use Loureiro-Porto's term 'verbonominal patterns' (henceforth VNPs) as a cover term for all the uses with the six shell nouns with grammatical meanings.

In a number of earlier diachronic studies, we investigated how structures with lexical uses of the nouns, which sanction various types of complementation, shifted to VNPs with modal and mirative meanings, viz. *('no') need* (Van linden et al. 2011), *('no') question* (Davidse & De Wolf 2012), *('no') way* (Davidse et al. 2014), *('no') doubt* (Davidse et al. 2015), *('no') wonder* (Gentens et al. 2016; Van linden et al. 2016), *('no') chance* (Van linden 2020; Van linden & Brems 2020). This study is based on those earlier lemma-specific corpus studies. The details of the data collection in terms of sample, query and subcorpora used are given in Table 1.

| Noun | Sample | Query | Subcorpora of Collins Wordbank*Online* | Reference |
|------|--------|-------|----------------------------------------|-----------|
| *chance* | Two 250-hit random samples, spoken and written | Lemma *chance* | British English subcorpora except brregnews | Van linden & Brems 2020 |
| | Exhaustive sample, 369 hits | String *no chance* immediately preceded by a punctuation mark | all the subcorpora | Van linden 2020 |
| *doubt* | 250-hit random sample | String *no doubt* | written British English subcorpora | Davidse et al. 2015 |
| *question* | 250-hit random sample | String *no question* | written British English subcorpora | Davidse & De Wolf 2012 |
| *need* | 300-hit random sample | Lemma *need* (specified part of speech: noun) | written British English subcorpora | Van linden et al. 2011 |
| *way* | 500-hit random sample | String *no way* | Brbooks | Davidse et al. 2014 |
| *wonder* | 500-hit random sample | Lemma *wonder* (specified part of speech: noun) | written British English subcorpora | Gentens et al. 2016; Van linden et al. 2016 |

Table 1: Overview of Present-day English datasets for the nouns studied

In this article, we set out to arrive, from a largely synchronic point of view, at the generalizations that will allow us to develop our semiotic framework for the analysis of grammaticalized signs expressing modal meanings. The specific steps in which we will pursue our general aim are the following.

Firstly, in Section 3, we will inventory the constructions in which the six shell nouns function with a lexical meaning and the constructions in which they are part of VNPs expressing modal meanings. For each shell noun, we will survey the structures in which the noun figures, such as the composite predicate *make question* in (1), and the existential clause *there was no question in* (3) as well as the various kinds of complements, like the finite clauses in (1) and (2), and the gerund in (3). In this survey section, we will, like Boye & Harder (2007), work with the traditional notions of 'CTPs' and 'complements' to keep the comparison of the lexical and grammatical uses as transparent as possible.     .

Secondly, in Section 4, we will focus on the semantics of the modal qualifications, approaching them in a way somewhat similar to Nuyts' (2005, 2017) hierarchy of qualifications of states-of-affairs. Rather than using the notion of state-of-affairs, we will characterize the different clausal layers in terms of the contrast between proposition and process as proposed by Halliday (1970, 1985, 1994) and Langacker (1987, 1991, 2015). After having set out this semantic typology, we will investigate the various ways in which the VNPs code the qualifications and the propositions or processes they relate to.

Thirdly and finally, in Section 5, we address the question of how we can model the different structural assemblies of the expressions with lexical and grammatical meaning, whereby the grammatical qualifications may be speaker-related or objective. If grammaticalization studies posit different types of structure, the fault line will typically be drawn between the lexical and the grammaticalized uses (e.g. Boye & Harder 2012). However, in applying McGregor's distinction between representational and interpersonal structures to the expressions containing shell nouns, we will argue for a different fundamental opposition, viz. between on the one hand, the lexical and objective modal uses, which are coded by representational structures, and, on the other hand, the speaker-related modal uses, which are coded by interpersonal structures. Whereas the former can all be modelled in terms of traditional dependency structures, we will argue that the latter are best modelled in terms of McGregor's (1997) notion of interpersonal modifiers. We will explicate how our analyses of the different qualifications reflect different views of grammar and grammaticalization from those held by Trousdale (2012) and Boye & Harder (2012).

### 3. Constructions with shell nouns used lexically and as part of grammatical qualifications

The aim of this section is to inventory the constructions in which the six shell nouns are used lexically and the constructions in which they are part of VNPs expressing modal meanings. In Section 3.1, we introduce the three main types of constructions in which the shell nouns are used lexically: (i) complex NPs, (ii) composite predicates and (iii) complex sentences. All three constructions involve some form of 'complexity', which is reconfigured semantically and structurally when they come to express grammatical meanings. The main types of grammaticalized constructions are (i) periphrastic auxiliaries and (ii) the discourse secondary use of a clause with modal or mirative meaning. In Sections 3.2 and 3.3, we expand the picture and we inventory further construction types and their variants both with lexical or grammatical meaning. In Section 3.2, we describe the component structures in which the shell nouns figure and in Section 3.3 their complements.

### 3.1 Main types of structure with shell nouns used lexically and as part of grammatical qualifications

Let us first consider the three main structure types in which the shell nouns are used with *lexical* meaning: complex NPs, e.g. (6), (7), composite predicates, e.g. (8), and matrices of complementation constructions (9), (10), (11).

(6)   Once we have this animal model then that will offer *a way* in which we can test therapies. (WB)
(7)   You will get *three chances* to key in the right number or your card will be rejected. (WB)
(8)   The car took a hammering but he would not *have need* of it for long. (WB)
(9)   And on the second occasion where *there was doubt* if a try was scored, I was in a perfect position to adjudicate. (WB)
(10)  Here we see bull games depicted in a little mural in the palace at Knossos in the king's chamber. *There's been a question* as to whether bull games of this kind, of people leaping over bulls, are possible. (WB)
(11)  *It was a wonder to them* that I get to do all this stuff. (https://our-story-begins.com/2015/08/)

Examples (6) and (7) feature complex NPs with embedded clauses. In (6) *way* is postmodified by the relative clause *in which we can test therapies*. In (7) the noun *chances* is followed by a non-finite complement clause specifying the action that can be taken. In (8), the noun *need* is part of a composite predicate formed with the light verb *have*, which has roughly the same meaning as the corresponding simple predicate *need*. Examples (9) to (11) are complementation constructions whose matrix is an existential (9)–(10) or predicative clause (11), followed by a complement clause. In (9) the impersonal matrix *there was doubt* conveys that 'some people doubted' if a try could be awarded. It is a construction of reported thought. Similarly, in (10) *there's been a question* ('some people have asked') is the matrix of a construction of reported speech. In (11) the matrix *it was a wonder to them* conveys that the speaker's children are very surprised, while the *that*-clause expresses the presupposed factive

proposition that they are surprised about. In other words, this is a factive construction meaning 'they were surprised that I get to do all that stuff'.

Turning to the VNPs with *grammatical* meaning, we find two main structure types: auxiliaries, e.g. (12), (13), and grammaticalized clauses, e.g. (14)–(17).

(12)    The King was waiting for them, his smile benign, his arms outstretched in welcome. … Brak fell to his knees and lowered his head, … "*You have no need* to kneel before me, Brakandaran. It is I who should bow to you. You have suffered much on our behalf." (WB)

(13)    She *had no way* to deal with such anxiety when she was 6. (WB)

(14)    But Sergio is now only £ 50,000 off an automatic place. *I have no doubt* he will achieve it. (WB)

(15)    She had been weeping, he could see that, but *there was no chance* that she would cry now because the apartment was filled with Agency staff. (WB)

(16)    He has the magic to unlock defences and *there is no question* he'll be a real ace in the pack for us. (WB)

(17)    Every gram of fat in a food supplies 9kcal. That's more than twice as many as 1 gram of protein or sugar or starch. So *it's no wonder* that high-fat foods are also high in calories. (WB)

In (12), we analyse *have no need* as a periphrastic modal auxiliary with the meaning 'you needn't kneel'. The King, as the modal source of the deontic modal (Verstraete 2005: 1410), *hic et nunc* cancels the obligation for Brak to kneel before him. An equivalent meaning can be expressed by the NICE modal[2] *need*, as in *you needn't kneel*. In other words, we posit that *have no need* has undergone a process of auxiliarization. This is reflected by grammatical behaviour that distinguishes this use from the lexical composite predicate *have need*, illustrated in (8). Firstly, the lexical predicate *have need* in (8) is followed by a prepositional phrase whose complement pronoun refers to a thing, *a car*. By contrast, in (12) auxiliary *have no need* is followed by a lexical *to*-infinitive (Noël 2001: 283). Secondly, whereas *have need* in (8) is the main lexical predicate of the clause, the auxiliary *have no need* does not contribute to the representational meaning of the sentence, but is a speaker-related qualification of the lexeme to which it applies, the predicate *kneel* in (12). We can conclude that *have no need* in (12) is a member of the paradigm of auxiliaries that also includes *need*.

For *have no way to* in (13), similar arguments can be adduced for its analysis as a modal auxiliary, which in this case can be paraphrased by the modal *could not*: 'She could not deal with such extreme anxiety'.[3] The meaning expressed is that of participant-imposed inability, a dynamic modal notion (Nuyts 2006). Modal VNP *have no way to* V and lexical *(no) way* contrast not only in their grammatical behaviour but also in their structural properties. Lexical *way* used as a nominal head is followed by a relative clause as in (6), which can be introduced by a number of prepositions such as *in*, *along, on, for*, etc. The modal VNP *have no way*, on the other hand, functions in the auxiliary slot of the VP and can only be followed by a lexical verb in the *to*-infinitive, as in (13), or by *of* + gerund. The meaning of the lexical noun *way* is more concrete, 'manner, means', whereas the VNP *have no way* expresses the more general semantic notions of 'inability' or 'impossibility'. In sum, *have no way* as illustrated in (13) has become a member of the paradigm that also includes the auxiliaries *can* and *be able*.

Examples (14)–(17) illustrate qualificational meanings expressed by discourse secondary uses of clauses with VNPs, either impersonal clauses with subjects *it* or *there* (see Davidse & Van linden 2019), or personal ones whose subject is a speech participant, like *I* in (14). Particularly in (14), *I have no doubt* is clearly parallel with complementation constructions with matrices like *I think*. While there is general

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[2] The acronym NICE was coined by Huddleston (1976) to refer to the four properties of core English modals like *must, should,* and *ought*, which have the ability to (1) be <u>n</u>egated as such (without *do*-support), (2) be <u>i</u>nverted vis-à-vis the subject, (3) to stand for, or '<u>c</u>ode', a previously mentioned VP by the modal only, presupposing the lexical verb from the preceding discourse, and (4) be <u>e</u>mphasized. Huddleston & Pullum (2002) also use the term NICE verbs for modal auxiliaries with these characteristics.

[3] *Way* used lexically ('means') can also be followed by a relative infinitive clause as in *They had no way to signal* (WB). Example (8) can in fact be viewed as a bridging context, for which both the lexical reading 'she had no tools to deal with such anxiety when she was six' and the grammatical reading 'she was unable to deal with such anxiety' are plausible.

agreement about the modal meaning of *I think* when it functions as a parenthetical, as in (18), no clear recognition criteria of non-parenthetical *I don't think* with modal meaning, as in (19), were provided by Hopper & Traugott's (2003: 207–209) notion of nucleus-margin reversal. Such criteria are spelt out by Boye & Harder (2007, 2012), who distinguish the grammatical from the lexical variants of CTPs in terms of discourse prominence. Information given in discourse may be either the primary predication, i.e. the most important information of an utterance, or a secondary predication, which serves only to support the primary one. Lexical expressions are discourse-primary.[4] This is reflected in their being 'addressable' by such linguistic tests as the *really*-probe or addition of a tag. These tests show that *I think* in (20) is discourse primary: *Really? Do you think other days that this is not fair? Other days* y*ou think "it's just not fair", <u>do you</u>?* The main point in (20) is about the speaker 'thinking' certain things on other days.

(18)    Pat Nevin, *I think*, would feel very comfortable with Eric alongside him. (WB)
(19)    *I don't think* he did anything wrong. (WB)
(20)    Other days *I think* "It's just not fair". (quoted from WB by Vandelanotte 2009: 296)

By contrast, the grammatical variant is "discursively secondary in relation to other expressions" (Boye & Harder 2012: 2), which is brought out by its not being addressable. The addressability tests bring out the discourse secondariness of both parenthetical and non-parenthetical clauses with grammatical meaning. In (18) the tag test shows that parenthetical *I think* with modal meaning is not discourse primary: *\*Pat Nevin, I think, would feel very comfortable with Eric alongside him, <u>don't I</u>.* In (19), where *I don't think* appears to be the structural matrix, the tag test likewise shows it is not discourse primary. *\*I don't think he did anything wrong, <u>do I</u>.* Rather, the main point of the utterance is 'he didn't do anything wrong', as shown by the tagging pattern in *I don't think he did anything wrong, <u>did he</u>*?

   As shown in our earlier studies (e.g. Gentens et al. 2016), Boye & Harder's (2007, 2012) tests can be extended to VNPs to identify the grammatical uses of both their parenthetical (21) and non–parenthetical variants (14)–(17).

(21)    Gunmen killed al-Alusi's two sons and a bodyguard when they opened fire on a car near his house. "I was the target of the attack, *there is no doubt*," al-Alusi said. (WB)

In (21), the *really*-probe shows parenthetical *there is no doubt* to be discourse secondary: *Really? Were you the target of the attack?* For (14)–(17), the tags pick out the non-parenthetical VNPs as discourse secondary and hence grammatical: (14) *I have no doubt he will achieve it, <u>won't he</u>*; (15) *there was no chance that she would cry now, <u>would she</u>*; (16) *there is no question he'll be a real ace in the pack for us*, <u>won't he</u>; (17) *So it's no wonder that high-fat foods are also high in calories*, <u>aren't they</u>. The non-lexical use of *it's no wonder* is also brought out by the fact that it cannot be probed by a graded question such as *How much or little wonder was it*?

   Semantically, the VNPs in (15) and (16) convey epistemic modality, which is intrinsically speaker-related (see Section 4.1.1). The speaker whose epistemic judgement is rendered may be either the actual or represented speaker. In (15), which is a context of free indirect speech with backshifted past tense, *there was no chance*, the represented speaker is the modal source. The direct version of the represented speaker's thought is *there's no chance she will cry*, in which the proposition can be addressed, e.g. *Really? Won't she?* In (16) *there's no question* gives the actual speaker's assessment of the likelihood that 'he' will be an ace. Finally, in (17), the VNP *it's no wonder* qualifies the primary proposition in terms of mirativity. In the typological literature, a mirative marker is generally understood as marking

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[4] According to Boye & Harder (2007: 586) one also has to recognize the existence of discourse secondary *lexical* CTP-clauses, which "exhibit a certain discrepancy between usage status and structural status". They illustrate this category with the underlined CTP-clause in the following example: *The beautiful ending to this story is that a priest took the family in until they were able to find another house to live in. [...]. <u>I always add</u> that that was why my mother, Nana, never was prejudiced against anyone* (Boye & Harder 2007: 585). On our analysis this clause is a discourse primary lexical use. The larger context is one of reported story-telling, as indicated by *The beautiful ending to this story is ... .* Both this clause and *I always add* can hence be addressed. In view of our own analyses and our theoretical commitment to a semiotic grammar, we do not see any motivation for the category of discourse secondary lexical uses.

the unexpected nature of a proposition, i.e. "sudden discovery, surprise and unprepared mind of the speaker (and also the audience or the main character of a story)" (Aikhenvald 2012: 435, cf. DeLancey 2001). However, with Simon-Vandenbergen & Aijmer (2007: 37) we hold that marking the opposite value, 'not surprising' or 'expected' is also part of the system of mirativity. As argued in Van linden et al. (2016), in (17), *it's no wonder* emphasizes the *expected relation* between the proposition, high-fat foods are high in calories, and its justification in the preceding context, every gram of fat in a food item supplies 9kcal. The meaning of *it's no wonder* can be paraphrased by an expectation adverb such as *of course* (Simon-Vandenbergen & Aijmer 2008: 172).

The issues of addressability and non-parenthetical versus parenthetical variants are somewhat complicated by the fact that a subset of the lexical uses, viz. reporting constructions like (9), (10) and (20), also have parenthetical variants. Do the addressability tests pick up the reporting clauses as discourse primary and lexical irrespective of their (non-)parenthetical status? To answer this question, we have to take into account the various types of reporting constructions. It is in direct and free indirect speech that the reporting clauses can be parenthetical, as illustrated in (22) and (23), but not in indirect speech (Vandelanotte 2009). Indirect reporting constructions allow fronting of the complement clause as the subject of a passive matrix, as in (24), or as an object with contrastive focus, as in (25). In both cases they remain hypotactic constructions.

(22)  "It's just not fair," he thinks on other days, "They shouldn't have treated me like this."
(23)  It was not fair, he thought on other days, they shouldn't have treated him like this.
(24)  That it was not fair was certainly thought by him on some days.

When applying the addressability tests to the examples with parenthetical reporting clauses, we observe that both the represented speech or thought act and the report can be addressed. For examples (22) and (23), for instance, the *really*-probe can address the representation of the thought act: (22) *Really? Does he think that on other days?* and (23) *Really? Did he think that on other days?* But the report can also be addressed: (22)*"It's just not fair, is it?" he thinks* and (23) *It was not fair, was it, he thought.* The reporting clauses and the reports constitute two discursive strata that are tactically independent of each other. With indirect thought, which is a hypotactic construction (Halliday 1994), only the matrix can be addressed, as with (24) *Really? Was that thought by him on certain days?*, not the complement clause: *\*That it was not fair, was it, was certainly thought by him on some days.*

We have to keep these distinctions in mind when we consider the addressability tests for the lexical reporting uses. Example (10), *There's been a question as to whether bull games of this kind are possible*, is a case of indirect speech. As predicted, only the matrix can be addressed: *There's been a question as to whether bull games of this kind are possible, hasn't there?* This is also the case if the report is fronted as in (25), which allows *That there was a real silk merchant he had no doubt, had he* but not *\*That there was a real silk merchant wasn't there he had no doubt.*

(25)  I know who's lying now, yes. Cazaril's lip turned up, without humor. That there was a real silk merchant, who had really ridden out of Cardegoss on that date, *he had no doubt.* (WB)

Free indirect speech is exemplified by (26). As predicted, the represented speech act can be addressed, *Really? Did you make no doubt?* as well as the report *The whole learned world, I made no doubt, would rise to oppose my systems, wouldn't they?* The paratactic juxtaposition of report and reporting clause creates two discursive strata, on each of which the clauses are discourse primary.

(26)  Witness you powers what fancied importance sate perched upon my quill while I was writing. The whole learned world, *I made no doubt*, would rise to oppose my systems; but then I was prepared to oppose the whole learned world. (CLMETEV, 1710-1780) (De Wolf 2010: 34)

When we list the types of structures in which the shell nouns can figure in Table 2 below, we include only the simple opposition between discourse primary and discourse secondary clause. As just explained, the lexical discourse primary clauses are either the matrix of a hypotactic structure like (25), or the parenthetical clause in free indirect reporting, as in (26). With the grammatical uses, the discourse secondary clauses are either non-parenthetical, as in (14)–(17), or parenthetical, as in (21).

**3.2 The component structures with shell nouns: further structural variation**

In this section, we focus on the first part of the complex structures introduced in the previous section: the component structures containing the shell nouns, both used with lexical meaning and as part of VNPs with grammatical meaning. We survey their structural variants as well as systematic alternates of each main type.

Two of the three main constructions in which the nouns are used lexically, viz. composite predicates and clauses with primary discourse status, have regular elliptical variants without subject and finite VP, as illustrated in (27). Because of their regularity they are not listed in separate columns in Table 2 below. The corresponding constructions with grammatical meaning, auxiliaries and discourse secondary uses of clauses, equally allow for elliptical variants, e.g. (28) and (29). *No need* in (28) can be a reduction of either *you have no need to pay* or *there is no need to pay*.

(27)   I had no hesitation after that. I have no doubt at all. *No doubt* whatsoever. (WB)
(28)   Pay Sky's cheapest package that offers all five of their sports channels for £26 a month. *No need* to pay the extra £60 season ticket. (WB)
(29)   Some teachers deal with this by concentrating their efforts on the higher grades, leaving the younger children to their own devices. *No wonder* that the younger children make slow progress. (WB)

We stress that the VNPs in (28) and (29) are elliptical clauses, not adverbials, because they take complements introduced by complementizers *to* and *that*. These complements are positionally fixed, as shown by *\*to pay the extra £60 season ticket, no need, \*that the younger children make slow progress, no wonder*.

Table 2 surveys the distribution of the structures just discussed for the six shell nouns. Possibility of occurrence is indicated by a tick and impossibility by a minus sign. The numbers between brackets refer to examples illustrating the structure in question, and hence amount to ticks.

| Noun | Use | Complex NP | Composite Pred. | Aux. | Primary CTP-clause | Secondary CTP-clause | Adverbial |
|---|---|---|---|---|---|---|---|
| *way* | LEX | (6) | — | — | — | — | — |
| | GRAM | — | — | (13) | — | ✓ | ✓ |
| *chance* | LEX | (7) | — | — | ✓ | — | — |
| | GRAM | — | — | ✓ | — | (15) | ✓ |
| *need* | LEX | ✓ | (8) | — | — | — | — |
| | GRAM | — | — | (12) | — | ✓ | — |
| *doubt* | LEX | ✓ | (27) | — | (9) | — | — |
| | GRAM | — | — | — | — | (14) | ✓ |
| *question* | LEX | ✓ | (1) | — | (10) | — | — |
| | GRAM | — | — | — | — | (2), (16) | ✓ |
| *wonder* | LEX | ✓ | ✓ | — | (11) | — | — |
| | GRAM | — | — | — | — | (17), (29) | (30) |

Table 2: Constructions with shell nouns used lexically or as part of grammatical qualifications

We can relate the patterns displayed in Table 2 to the six nouns as follows. Looking first at their *lexical* uses, we see that all shell nouns studied can be used as lexical heads of complex NPs. Four, *need*, *doubt*, *question*, *wonder*, figure in lexical composite predicates such as *make question* (1), *have need* (8), *have no doubt* (27), with roughly the same meaning as the corresponding simple lexical verb, except *way,* which does not have a corresponding verb *\*to way* and *chance*, which has no corresponding lexical

verb taking a complement clause.[5] A slightly different set of four, *doubt*, *question*, *wonder*, *chance*, figure in discourse primary matrices of complementation constructions, as illustrated in (9), (10), and (11).

The six nouns distribute over the constructions expressing *grammatical* qualifications in the following way. Adverbials, as in (30), are attested for *no doubt/ question* (strong likelihood that proposition is the case), *no chance* (strong likelihood that proposition is not the case), *no wonder* (mirative non-surprise), *no way* (mirative surprise). They are what Quirk et al. (1985: 612ff) call disjuncts, i.e. adverbials that are not part of the internal clause structure and apply to the proposition in their scope. In contrast with the elliptical variants of clauses as in (28)–(29), disjunct adverbials are not constituents of the same structure as the proposition and are positionally flexible with regard to it.

(30)   You er had a lot of invitations to work *no wonder* I mean er you've told me you were invited to go abroad. (WB, brspoken)

Auxiliaries are attested with *chance*, *need* (12) and *way* (13). Discourse-secondary clauses are found with all six nouns, which scope over the whole proposition or process in the primary clause, e.g. (2), (14), (15), (16), (17) and (29). They are most common with *there be no doubt/ question/ wonder*, but they are also found with *there be no chance/way* (15) and (*there be) no need* (28). We will return to the structure and grammatical meaning of the auxiliary uses and discourse secondary clauses in more detail in Sections 4 and 5.

### 3.3 Complement types

In this section we focus on the second part of the complex structures, which at this stage we refer to with the traditional notion of 'complement' types. The parenthetical constructions discussed in Section 3.1, examples (21)-(26), have to be left out of consideration here. Table 3 lists all the complement types found with the shell nouns used lexically and as part of grammatical qualifications.[6]

| Noun | Use | PP (entity) | PP (ASE) | *to-*infinitive | *of/for* + gerund | interrog. clause | *that*-clause | declarat. *if*-clause |
|---|---|---|---|---|---|---|---|---|
| *way* | LEX | ✓ | ✓ | ✓ | ✓ | — | — | — |
| | GRAM | — | ✓ | (13) | ✓ | — | ✓ | — |
| *chance* | LEX | ✓ | (31) | (7) | ✓ | — | ✓ | — |
| | GRAM | — | (32) | ✓ | ✓ | — | (15) | — |
| *need* | LEX | (8) | ✓ | ✓ | ✓ | — | — | — |
| | GRAM | — | ✓ | (12), (28) | ✓ | — | ✓ | — |
| *doubt* | LEX | — | ✓ | — | ✓ | (9) | ✓ | — |
| | GRAM | — | — | — | — | — | (14) | — |
| *question* | LEX | — | ✓ | — | ✓ | (10) | ✓ | — |
| | GRAM | — | ✓ | — | (33) | — | (16) | — |
| *wonder* | LEX | — | — | — | — | ✓ | (11) | — |
| | GRAM | — | — | — | — | — | (17), (29) | (34) |

Table 3: Complement types with shell nouns used lexically or as part of grammatical qualifications

We saw in Section 3.2 that *chance*, *need* and *way* tend to figure in different sets of constructions than *doubt*, *question* and *wonder*. This is also the case for the sets of formal complement types they take. In their lexical uses, *chance*, *need* and *way* can be complemented by prepositional phrases designating either an entity, like *have no need of a car* (8) or an action, state or event (henceforth ASE), like *chances of further promotions* (31), or by verbal complements like *to*-infinitives (7) and gerunds. The VNPs with

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[5] *To chance* is used as a semi-auxiliary in examples like *I chanced to pass* (WB), and as a lexical verb with the specific sense of 'touch by chance', e.g. *Jo chanced her arm* (WB).
[6] Table 3 does not include the relative clause following *way* in its lexical uses, cf. (6), as a relative clause is a postmodifier, not a complement (see Section 5.1).

*chance, need* and *way* expressing deontic-dynamic modal meanings can be complemented by *of* + nouns with verbal meaning, e.g. (32) *he had no chance of survival* ('he couldn't survive'),[7] *of/for* + gerunds, e.g. (33) *There was no question of her staying* ('she couldn't stay'), and *to*-infinitives, as in (12), *you have no need to kneel* ('you needn't kneel') and (13) *She had no way to deal* ('she couldn't deal').

(31) The need to quit arises when there are *no chances of further promotions*. (WB)

(32) Surgeons thought Carl Sutton *had no chance of survival* when his heart stopped beating for 12 minutes after a 30ft fall. (WB)

(33) I've got an idea that Debbie wouldn't have let that upset her A-levels, in fact; but *there was no question of her staying on at school to sit them*. (WB)

The most frequent construction type in which *doubt*, *question* and *wonder* figure with lexical meanings is complement constructions with either declarative clauses, e.g. *It was a wonder to them that I get to do all this stuff* (11), or interrogative clauses, e.g. *they made question to what intent they should rise* (1), *there was doubt if a try was scored* (9). In their grammatical, discourse-secondary meaning, the VNPs with *doubt* and *question* retain only the declarative complements, which they qualify in terms of modality, e.g. *I have no doubt he will achieve it* (14) and *there is no question he'll be a real ace in the pack* (16). *Chance*, *need* and *way* can also function in discourse-secondary clauses, taking declarative clauses, e.g. *There was no chance that she would cry now* (15). Miratively qualifying *it's no wonder* can also take an *if*-complement clause, which, however, is not interrogative but declarative, as in (34).

(34) Canada is trying hard. But *it's no wonder if they're a bit defensive*. The U.S. media has been beating up on Canada since 9-11. (WB)

## 4. Grammatical uses and the hierarchy of modal qualifications

In Section 3, we inventoried the structures in which the shell nouns are used lexically or as part of grammatical qualifications in fairly traditional terms. We now set about developing our model for analysing the modal and mirative qualifications expressed by the VNPs. In Section 4.1, we will propose a semantic analysis that applies to core modal auxiliaries as well as to the periphrastic modal verbs and grammaticalized clauses this article focuses on. We aim at elucidating the distinctions between epistemic, deontic and dynamic modality, whereby we will concentrate on two parameters: +/– speaker-relatedness and +/– possibility of negating the modality. The semantic model will be conceptualized as a hierarchy (cf. Nuyts 2005, 2017). Importantly, we are actually dealing with two hierarchies.[8] On the one hand, the different types of modal qualification will be ranged in such a way that the ones higher on the hierarchy scope over the qualifications lower on the hierarchy. On the other hand, the different clausal layers that the qualifications relate to also form a hierarchy. We will characterize the different clausal layers in terms of the contrast between proposition and process as proposed by Halliday (1970, 1985, 1994) and Langacker (1987, 1991, 2015). In Section 4.2 we will link the formal 'complement' types (Table 3) that are found with each of the qualifications to the clausal layers being symbolized.

### 4.1 Hierarchies of modal qualifications and clausal layers

In this section, it will be argued, in a nutshell, that modality divides into two major subtypes, interpersonal (or 'subjective') and representational (or 'objective') modality (Halliday 1970, Verstraete 2001, 2007). Epistemic modality is inherently interpersonal. Deontic modality has an interpersonal and a representational subtype. Dynamic modality is inherently representational. This view on modality is embedded in the distinction between the interpersonal and representational organization of the clause as

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[7] We analyse such VNPs complemented by nouns describing actions, states or events as grammatical patterns. Grammaticalization paths from source constructions with other nouns have likewise been shown to include a nominalization stage on their way to full auxiliarization. As argued by Van Rompaey & Davidse (2014), patterns like *In the midst of his conversations with secular men, the saint was often called aside of God* are 'nominal aspectualizing constructions', in which a participant is depicted as engaging in an action in progress.

[8] We sincerely thank one of the anonymous reviewers for pointing this out to us.

made by Halliday (1970, 1994), McGregor (1997) and De Smet & Verstraete (2006).[9] Representational meaning involves combining elements into a structure that represents our experience of the world. Interpersonal meaning involves *hic et nunc* "enactment of the speaker's position with respect to" (Halliday 1970: 325) the representational content.

### 4.1.1 Interpersonal modifications: deontic and epistemic modality, mirativity

In this section, we consider interpersonal deontic modality, epistemic modality and mirativity. The two modal types tie the representational content they scope over to the situation of utterance, or "the ground, (i.e. the speech event, the interlocutors, and what they presumably know)" (Langacker 2016: 4), that is, they have a 'grounding' function. With interpersonal deontic modality, the speaker ties a *process* to the speech exchange by assessing the *desirability* of the process being realized. This type of modality can be realized only by modal auxiliaries (not adverbials), i.e. by core auxiliaries like *must, should, shall, may*, and, marginally, by periphrastic auxiliaries like the VNP *have (no) need*, etc. With epistemic modality the speaker grounds a *proposition*, i.e. a process deictically located in time, by assessing the *likelihood* of it being the case. Epistemic modality can be realized by modal auxiliaries, e.g. *must, will, may*, modal adverbials, e.g. *certainly, probably, perhaps*, and discourse secondary clauses like *I think*. In the last two categories, the shell nouns studied offer a plethora of expressions with adverbials like *no doubt, no question*, etc. and discourse-secondary clauses like *there's no doubt, there's no chance*, etc. Mirative qualifications scope over a grounded proposition, assessing its (non)-expectedness. They can be realized by adverbials like *no way* and discourse-secondary clauses like *it's no wonder*. We will set out our view of these three types with reference to the relevant literature, working our way up the hierarchy in terms of their increasing semantic scope, i.e. from deontic (§1) over epistemic (§2) to mirative (§3).

### §1. Interpersonal deontic modality

Interpersonal deontic modality involves the interlocutors negotiating in the here and now of the speech exchange (Nuyts 2001; Verstraete 2001) whether it is *desirable* that the represented *process* is realized.[10]

In declaratives, it is the speaker that is construed as the one assessing the desirability of the process. In (35), for instance, the quoted speaker, Andrew McClintock, is construed as giving permission to the girl to leave, conveying the meaning 'I permit you'. In an interrogative like *May I go*?, it is the hearer that is construed as the one assessing the desirability of the process.

(35)    Andrew McClintock nodded his head to the girl. "You *may* go." (WB)

Choice of polarity is an intrinsic component of the semantic system of interpersonal deontic modality (Halliday 1970): some subtypes have positive polarity and others negative polarity. The speaker takes a stance on the desirability of the process 'going ahead' (e.g. permission or obligation) or 'not going ahead' (e.g. exemption from obligation, absence of permission). Speakers enact their deontic stance in the here and now of the speech event. These deontic modal stances cannot be located as anterior or posterior to the temporal zero-point (Declerck 1991b: 14–16) and they are not even 'located' as simultaneous with it. Interpersonal deontic modality is outside of the representational system of tense (Halliday 1970). This is reflected in the fact that core auxiliaries like *must*, *need*, *should* and *shall* cannot be declined for tense (Declerck 1991a). If 'remote' forms are available, then, when used to express interpersonal deontic modality, they convey meanings such as tentativity (Declerck 1991a: 372), like *might* in (36).

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[9] Following Halliday (1970), these authors in fact use "ideational" rather than "representational" (Hengeveld 1989). We use the latter term as it has wider currency and is arguably more transparent.

[10] In contrast with Nuyts (2017), deontic modality is understood here to include both directive meanings such as imposing obligation and granting permission (e.g. von Wright 1951: 36; Lyons 1977: 823–841; van der Auwera & Plungian 1998: 81) and assessments of desirability without directive force (cf. Nuyts et al. 2010; Van linden & Verstraete 2011). What is crucial is that the actualization of the SoA under deontic assessment, e.g. you kneeling before me in (12), is not located in time, but considered as a purely potential concept.

(36)  'George, I know you are not on top of your lines, but *might* I have some eye-contact please?' (WB)

Interpersonal deontic modality scopes over a process, i.e. a process-participant(s) configuration not located in time (Halliday 1970), realized by the lexical verb as such, its participants and any circumstantial modifiers it may have (Langacker 1991). This virtual process incorporates a polarity choice. If positive, then the whole utterance is about the desirability of realizing a process, as in (35) and (36); if negative then the utterance is about the desirability of refraining from the process, as in (37), in which the speaker imposes obligation not to panic, i.e. there is 'internal' negation of the process.

(37)  You *must* not panic. (WB).

The process whose desirability is being negotiated is always construed as a potential one and is hence never deictically located in time (Bolinger 1967: 351–359). The processes do allow for variation in non-finite tense (Halliday 1970), which expresses relative time vis-à-vis some represented or implied time. Simultaneity is expressed by the simple infinitive, as in (37), while anteriority is expressed by the perfect infinitive, e.g. *have been awarded* in (38), and posteriority by future infinitives like *be about to be awarded* in (39). The unmarked option of simultaneity is a meaningful choice, as the other options are in principle possible.

(38)  You must *have* been awarded your degree before you can apply.
(39)  You must at least *be about to* be awarded your degree before you can apply.

In sum, interpersonal deontic modality construes the interlocutors as the ones assessing in the here and now of the speech event the desirability of a process (not) going ahead, incorporates polarity as an intrinsic semantic parameter and is outside of the representational system of tense. It scopes over a process construed as potential, featuring choices from the non-finite system of tense, and from the system of polarity.

We illustrate the applicability of this analytical model to the VNP auxiliary in (12), *You have no need to kneel before me*. This clause is uttered by the King, who has the authority to exempt the hearer from the obligation to kneel before him. The modal meaning thus incorporates negation: it cancels obligation. In the VNP, this negation is expressed by the negative quantifier *no*. The same modal meaning is expressed by the NICE modal *need*, as in *you needn't kneel*. While the NICE modal intrinsically has no tense marking, the VNP *have no need* cannot shed its tense marking. However, if it expresses enacted deontic modality, it is intrinsically grounded in the here and now of the speech event and hence occurs in the present tense. It can only appear in a past form if it is backshifted in (free) indirect speech, as in *I had no need to kneel before him, the Prince said* (where the Prince, i.e. the represented speaker is the modal source), We will return to this point when we consider representational modality, which is inside the domain of representational tense (Section 4.1.2). To express exemption from the obligation to carry out a specific act, the modality has to scope over a process with positive polarity 'you kneel before me'. This process is construed as a purely potential process with the unmarked simultaneity option. We conclude that the proposed semantic analysis can be applied equally to core modals and grammaticalized periphrastic ones.

*§2. Epistemic modality*
Epistemic modality is inherently interpersonal: it construes speaker assessment of the degree of likelihood that a proposition is the case. Importantly, epistemic modal markers express inherently positive degrees of probability. As Halliday (1970: 333) put it, "There is no such thing as a negative (epistemic) modality. All [epistemic] modalities are positive. This is natural, since [it] is an assessment of probability, and there is no such thing as a negative probability".[11] Nuyts (2001) likewise stresses that

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[11] In Halliday's later treatment of epistemic modality (e.g. Halliday 1985, Halliday & Matthiessen 2004), this point was given up in favour of the view that the extremes of the epistemic modal scale, "defined as a scale of *likelihood* [ …] in relation to propositions", are formed by positive polarity 'it is so' and negative polarity 'it

epistemic modality involves a scale of semantically positive degrees of probability. The positive probabilities may be anything in between 10% and 90% so to speak, but not 100%. To express with 100% certainty that a proposition is the case, one has to use a simple declarative. To this semantic feature, Halliday (1985: 340) refers as 'the modal paradox': 'You only say you're sure when you're not'. This point is nicely illustrated in the following overheard use of certainty marker *surely*, in which the undertone of uncertainty is easily detectable:

(40)    I've only managed to study nine out of the ten chapters of Professor X's course. *Surely*, he's not going to ask questions from the tenth chapter at the oral exam.

Are there arguments for the positivity of epistemic modality besides the semantic point that probabilities are inherently positive? We propose that this semantic point is clearly reflected in the distinctive formal behaviour of negation in utterances with epistemic modality, which is not found in utterances with deontic and dynamic modality. Negation of the proposition can be put structurally in the epistemic marker, but the utterance still conveys the ascription of a positive probability to a negative proposition. This is clearly illustrated by grammaticalized expressions of epistemic modality like *I think*, as discussed by Boye & Harder (2007: 578): (19) *I don't think he did anything wrong* is semantically roughly equivalent to (19)' *I think he didn't do anything wrong*. Irrespective of the location of the negation, if we replace the discourse secondary clause in (19) and (19)' by an adverbial, the utterance comes out with a negative proposition: *Probably, he didn't do anything wrong*. We have here what is traditionally known as 'NEG-raising', which, Boye & Harder (*ibid.*) point out, is possible only with the grammatical variants. A lexical use like *Other days I think that it's just not fair* is not semantically equivalent with *Other days I don't think that it's just fair*. We further point out that the possibility of NEG-raising is unique to epistemic modality. It is not possible with interpersonal deontic modality. *I oblige you not to give in* is not equivalent with *I do not oblige you to give in*. This is because positive versus negative polarity is a semantic parameter defining the different types of interpersonal deontic modality, as we saw in §1. In Section 4.1.2, we will see that, for the same reason, it is impossible to structurally transfer negation from the process into expressions of objective deontic modality and dynamic modality and maintain semantic equivalence.

Epistemic speaker stance is enacted in the here and now of the speech event, which is reflected in specific properties of the various types of epistemic markers. There is obviously no temporal meaning to modal adverbials like *certainly, no doubt,* etc. Epistemic modal auxiliaries like *will, can, may* have 'remote' forms *would, could, might* but they express a more tentative likelihood, not location in the past. Grammaticalized modal clauses like *I think*, *I have no doubt, there is no chance*, etc. are typically used in the present, but also have 'remote' forms, e.g. *I thought*, which convey greater tentativeness. They can also be rendered in the 'reported past', in which first and second person pronouns are shifted to the third person, and the present tense is back-shifted if the reporting situation is past, as in (15) *She had been weeping, he could see that, but there was no chance that she would cry now* (see Section 3.1). Interpretatively, the pronouns still refer to speech participants and the time is still simultaneous with the situation of utterance.

Epistemic modality scopes over a proposition, which is a process-participant(-circumstance) configuration located in time relative to the 'now' of the situation of utterance. That is, the main difference between the process scoped over by deontic modality and the proposition scoped over by epistemic modality is the latter's temporal location relative to the deictic temporal reference point. It is this deictic location which creates a proposition that "can be argued about" (Halliday 1994: 75) by giving it *a temporal reference point* [our italics] in the situation of utterance. This deictic temporal location may be inferable or coded. In English, core epistemic modal auxiliaries only take non-finite tense, which does not code deictic location. Therefore they neutralize semantic distinctions, which can, however, be made explicit by adding adverbials. For instance, in (41), the perfect infinitive is compatible with temporal location of the process in the past relative to the deictic reference point (41a) or to a past reference point (41b), or with location in a period starting in the past and leading up the present (41c),

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isn't so' (Halliday 1985: 75, Davies 2001: 218). Further down in this section, we will give arguments against this account.

as brought out by the adverbial expressions of time (Halliday 1970: 337). In utterances in which the proposition is coded by a finite clause, as in (42), the deictic location is coded by the finite VP.

(41)   He must have left
          (a) yesterday.
          (b) before we arrived.
          (c) some time this week. (cf. Halliday 1970: 337)

(42)   (a) Surely/No doubt he left yesterday.
          (b) Surely/No doubt he had left.
          (c) Surely/No doubt he has already left. (cf. Halliday 1970: 337)
          (d) Surely/No doubt he hasn't left yet.

Importantly, propositions incorporate a polarity value. A positive proposition refers to the real world in which the occurrence of the process is located at a specific time, e.g. 'he has already left' in (42c). As clarified by Holvoet (2020), a negative proposition, e.g. 'he hasn't left yet' in (42d), refers to a possible world differing from the real world only by the non-occurrence of the process at that specific time.

This conception of positive and negative propositions is key to understanding the point that epistemic modality ascribes inherently *positive* degrees of probability to propositions. Example (42c) ascribes a high degree of probability to a positive proposition, i.e. a 'thesis' (Halliday 1970) about the *occurrence* of 'his having left' in the period up to the moment of speaking. Example (42d) ascribes a high degree of probability to a negative proposition, i.e. a claim about the *non-occurrence* of 'his having left' in the period up to the moment of speaking. It is essential to this – in our view correct – account that *modality scopes over the polarity* of the proposition. Epistemic modalities form a scale of positive probabilities scoping over either positive or negative propositions (as in Halliday 1970, Nuyts 2001). It is essential to the scoping relation between epistemic modality and the polarity of the proposition to view them as *two distinct* grammatical systems operating at different points in the structural assembly of the utterance. We therefore refer to this as the 'scoping' account. We propose to visualize Halliday's (1970) version of the scoping account for the canonical modal auxiliaries *must*, *will* and *may* as in Figure 1, whose leftmost column lists the three main degrees of probability, *certainly* 'high', *probably* 'median', and *possibly* 'low'. The top row contains positive versus negative proposition as essential options. The second column ascribes the positive degrees of probability to the positive proposition, while the third ascribes the positive degrees of probability to the negative proposition. That last column shows how the canonical modal auxiliaries structurally incorporate the negation of the proposition: *mustn't, won't, mayn't*. They have what Declerck (1991a) calls 'internal' negation, bearing on the proposition.

|  | positive proposition *he has left* | negative proposition *he hasn't left* |
| --- | --- | --- |
| modalization |  |  |
| certainly | *he must have left* | *he mustn't have left* |
| probably | *he will have left* | *he won't have left* |
| possibly | *he may have left* | *he mayn't have left* |

Figure 1. Modality scoping over positive or negative proposition (Halliday 1970)

Remarkably, Halliday (1985, 1994) and Halliday & Matthiessen (2004) later changed this earlier account of epistemic modality, and came to view positive and negative polarity as forming the extremes of the epistemic modal scale (Halliday 1985: 335), with epistemic modals viewed as "the intermediate possibilities between the 'yes' and 'no' poles of asserting and denying: 'it is so'/ 'it isn't so'" (Davies 2001: 218). In this analysis, positive and negative polarity form the extremes of a *continuum* containing the three degrees of positive probability associated with *certainly* 'high', *probably* 'median', and *possibly* 'low'. We refer to this analysis as the 'continuum' account. Figure 2 is a reproduction of the figure offered by Halliday (1985: 335) of epistemic modality.

Modalization
'indicative' type
[probability]

                    *he has left*
*certainly  he must have left*
*probably   he will have left*
*possibly   he may have left*
                    *he hasn't left*

Figure 2: Polarity–modality continuum (Halliday 1985: 335)

We see the following problems with this later account. Firstly, and perhaps most obviously, *mustn't, won't* and *mayn't* are not included in the system. In this later account, one does not know where to locate utterances with these forms, which, we maintain with Halliday (1970), realize positive probabilities ascribed to a negative proposition. Secondly, by viewing positive and negative polarity as the extremes of the epistemic modality scale, the latter cannot be conceived of as scoping over the positive or negative polarity of the proposition. Thirdly, polarity and epistemic modality are viewed as operating at the same point in the structural assembly of epistemically modalized utterances. This, we argue, is untenable. Obviously, with negative propositions like *He mustn't have left yet*, the high degree of probability expressed by *must* scopes over, and operates at a different point in the structural assembly, than *n't*, which expresses the negative polarity of the proposition 'he hasn't left'. Likewise, with positive propositions like *He must have left*, the degree of probability expressed by *must* operates at a different point in the structural assembly, scoping over the proposition *He has left*, which it modifies.

Summing up the argument so far, we have argued that it is distinctive of epistemic modality that it involves exclusively positive modal notions so that negation structurally associated with the modal expressions still applies to the proposition. In what follows we further think through these distinctive features, and apply them to the VNPs studied in this article. A positive proposition is a thesis about occurrence of a process at a specific moment in time, and a negative proposition a thesis about non-occurrence of the process at that moment in time. Now, addition of epistemic modal markers to a proposition *subtracts* something[12] from the straight positive or negative thesis. More specifically, we argue, epistemic modification of a positive proposition, which is about occurrence of a process, introduces the possibility of non-occurrence of the process at the time indicated. Epistemic modification of a negative proposition, i.e. a thesis of non-occurrence of the process at a specific time, introduces the possibility that the process did occur at that time. Hence, we propose that epistemically modalized utterances convey the *assessment of the probability of occurrence versus non-occurrence* of a temporally located process.

By way of elaboration of the proposed semantics, we can quantify the probability of occurrence or non-occurrence *expressed* by high, median and low modal markers in terms of rough numerical values as suggested by Davies (2001). To this, we can add the *implied* probability of the opposite, i.e. non-occurrence or occurrence.[13] The modal marker *must* in *He must have left* can be thought of as putting the probability of occurrence vs. non-occurrence at 9 to 1. The high modal value ascribed by *must* to the positive proposition (occurrence) is represented by '9',[14] while '1' reflects the implied low possibility of non-occurrence. If *must* modifies a negative proposition, *He mustn't have left*, then the probability of non-occurrence vs. occurrence is 9 to 1. A median modal marker modifying a positive proposition, as in *He will have left*, can be thought of as assessing the probability of occurrence vs. non-occurrence at 7 to 3. If the median marker modifies a negative proposition, *He won't have left*, the probability of non-occurrence vs. occurrence is 7 to 3. In the case of both high and median modalities, the probability of occurrence vs. non-occurrence is skewed. By contrast, a low modal marker like *may* can be thought of as conveying an equal 5 to 5 probability of occurrence and non-occurrence, as reflected in alternative

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[12] We thank Kasper Boye (p.c.) for discussing this point with us.

[13] The proposed numbers are used to make the argument, not by way of any strong descriptive claim.

[14] Recall that even the highest modal markers do not convey complete certainty.

expressions like *He may or may not have left.* Figure 3 adds these probabilities of occurrence versus non-occurrence to the main modal types modifying positive and negative propositions in Figure 1.

| | positive proposition | | negative proposition | |
|---|---|---|---|---|
| | *he has left* | | *he hasn't left* | |
| | | probability of occurrence vs. non-occurrence | | probability of non-occurrence vs. occurrence |
| high | *he must have left* | 9 to 1 | *he mustn't have left* | 9 to 1 |
| median | *he will have left* | 7 to 3 | *he won't have left* | 7 to 3 |
| low | *he may have left* | 5 to 5 | *he mayn't have left* | 5 to 5 |

Figure 3. Probabilities of occurrence vs. non-occurrence conveyed by epistemic markers modifying positive and negative propositions

Let us now apply this analysis to examples with NEG-raising in grammaticalized clauses. Halliday's (1970) account included a whole array of clauses expressing epistemic modality. He (1970: 332) pointed out that it is only with clauses expressing a 'median' value on the epistemic scale that the negation can be structurally moved into the modal clause, e.g. (43b), while remaining semantically equivalent with the variant in which the negation is in the complement clause, as in (43a).

(43)    (a) It is probable that this gazebo was not built by Wren. (Halliday 1970: 332)
        (b) It is not probable that this gazebo was built by Wren. (ibid.)

However, if the positive modal clause contains a low value modal, like *it is possible* in (44a), then, for there to be semantic equivalence, the negative clause has to contain a high value modal, like *be certain* in (44b), and vice versa, if the positive clause contains a low degree marker (Halliday 1970: 332).

(44)    (a) It is possible that this gazebo was not built by Wren. (ibid.)
        (b) I am not certain that this gazebo was built by Wren. (ibid.)

The typical example considered in NEG-raising is, of course, *I think*, which expresses a median degree of likelihood. We now see that this is why (19) *I don't think he did anything wrong* is equivalent to (19)' *I think he didn't do anything wrong*. But Halliday's (1970) observations alert us to the fact that more comprehensive accounts of NEG-raising, such as we aim to give of the VNPs studied in this article, have to factor in the shifts in degree between clauses expressing non-median modal values.

Preliminary to this, we first have to point out that, while negative quantifiers in VNPs may code the negative polarity of the proposition, they do not do so in all cases. Negative quantifiers may have two different effects in VNPs. In VNPs like *there's no doubt/question* the negative quantifier and the semantically negative shell noun cancel each other out (p.c. María José López Couso), producing an intensified notion of likelihood. For instance, in (45), *there's no doubt* ascribes high probability to a positive proposition, i.e. 'for sure, he will achieve it'.

(45)    There's no doubt he will achieve it.

But in VNPs like *there's no chance* in (46), *no* does code the negative polarity of the proposition. This VNP is a marker of high probability ascribed to a negative proposition, i.e. 'surely, she won't cry'.

If we undo the NEG-raising, keeping the same VNP, then we get (46)' *There's a chance she will not cry*. As predicted, this yields a non-equivalent utterance, in which low probability is ascribed to the same negative proposition, i.e. 'perhaps, she won't cry'. By the same token, (46) and (46)' confirm the

principle that, irrespective of whether the negation is located in the modal marker or the proposition, semantically it applies to the proposition.

(46)   There's no chance she will cry.

We are now in a position to give a more comprehensive account of NEG-raising in grammaticalized clauses. NEG-raising always involves a negative proposition, as it structurally transfers the negation of the proposition to the modal marker. Figure 4 visualizes the patterns of (non-)equivalence for discourse secondary uses of clauses like *I (don't) think*, *I'm (not) sure* and VNPs like *there's (no/a) chance*. The modal markers containing raised negation are underlined. With markers expressing median modal value like *I think* and *I don't think* there is semantic equivalence, both expressing a probability of non-occurrence vs. occurrence of 7 to 3. However, with a clause expressing high modal value like *I'm sure*, there is no such equivalence. Without raising, as in *I'm sure he hasn't left,* a probability of non-occurrence vs. occurrence of 9 to 1 is expressed. But with raising, as in *I'm not sure he has left*, a low probability of non-occurrence versus occurrence of 5 to 5 is expressed, equivalent to *perhaps he hasn't left*. Likewise, a clause expressing low modal value like *there's some chance he hasn't left* conveys a probability of non-occurrence vs. occurrence of 5 to 5. But its counterpart with NEG-raising, *There's no chance he has left* expresses a probability of non-occurrence vs. occurrence of 9 to 1. We thus see how explicating the semantics of modalized propositions in terms of probability of occurrence versus non-occurrence gives us the tools to analyse the patterns of equivalence between clausal modal markers with and without NEG-raising.

| | negative proposition | |
| --- | --- | --- |
| | *he hasn't left* | |
| | | probability of non-occurrence vs. occurrence |
| high | *I'm sure he hasn't left*<br>*there's no chance he has left*<br>*surely he hasn't left* | 9 to 1 |
| median | *I think he hasn't left*<br>*I don't think he has left*<br>*probably he hasn't left* | 7 to 3 |
| low | *there's some chance he hasn't left*<br>*I'm not sure he has left*<br>*perhaps he hasn't left* | 5 to 5 |

Figure 4: Probabilities of occurrence vs. non-occurrence of negative propositions coded by clausal epistemic modal markers

Importantly, our model correctly predicts the semantics and the patterns of (non-)equivalence of propositions modalized by the VNPs studied in this article. In Figure 5, we set out the three discourse secondary uses of VNPs with modal meaning attested with some frequency in our data: *there's no doubt/question, there's no way/chance, there is a/some chance*. *There is some doubt/question* seems to be used mainly lexically, as it tends to be followed by questions introduced by complementizers like *as to whether*.

| | *he has left* | | *he hasn't left* | |
|---|---|---|---|---|
| | | probability of occurrence vs. non-occurrence | | probability of non-occurrence vs. occurrence |
| high | *there's no doubt/ question he has left* | 9 to 1 | *there's no chance/way he has left* | 9 to 1 |
| | *there's no chance/way he hasn't left* | | *there's no doubt/ question he hasn't left* | |
| low | *there is a/some chance he has left* | 5 to 5 | *there's a/some chance he hasn't left* | 5 to 5 |

Figure 5. Probabilities of occurrence vs. non-occurrence of positive and negative propositions coded by VNPs

In the right half of Figure 5, we find the VNPs applying to a negative proposition. In the top cell, *there's no chance/way* have NEG-raising in that the negation in them applies to the proposition 'he hasn't left', to which it ascribes a probability of non-occurrence vs. occurrence of 9 to 1. In the left half of the figure, we find the VNPs modalizing positive propositions. In the top cell, the VNPs *there's no doubt/question* express a high probability of occurrence vs. non-occurrence of 9 to 1. The negative quantifier and semantically negative noun intensify this probability to such an extent that one might argue that we are looking more at a ratio of, say, 9.5 to .5. However, for clarity's sake we will not take our account to that level of detail. In the bottom row of Figure 5, we find the VNPs *there is a/some chance* modifying either a positive or a negative proposition. As they express low modal value, there is rough equivalence between these two options.

The possible combinations are further multiplied by the fact that *there's no doubt/question* can congruently combine with a negative proposition *he hasn't left*, expressing without NEG-raising a high probability of non-occurrence more or less equivalent with *there's no chance/way he has left*. Likewise, *there's no chance/way*, which has NEG-raising, can combine with a negative proposition *he hasn't left*, in which the two negations cancel each other, conveying high probability of occurrence. We therefore put this utterance in the top cell of the left half, under *there's no doubt/question he has left*, which it is roughly equivalent with.

In sum, the proposed model of epistemic modality allows us to analyse the meaning of modal auxiliaries, adverbials and discourse-secondary clauses. Moreover, it not only accounts for what is traditionally viewed as NEG-raising, but also gives us the tools to more broadly assess equivalences between VNPs as in *there's no chance she will cry* and *there's no doubt she will not cry*. As a semantic theory of epistemic modality, our proposal is linguistically motivated: it articulates the consequences of the insight that positive and negative polarity are intrinsic constituents of a proposition, which entails that, if the proposition is epistemically modified, the probability of occurrence vs. non-occurrence is an inherent component of its semantics.

*§3. Mirativity*

The VNPs *it is a/no wonder* convey mirative modification: they mark a presupposed proposition as either 'surprising/unexpected/', as in (47), or 'expected/not surprising', as in (48) (Simon-Vandenbergen & Aijmer 2007: 37). With authors like Chafe (1986) and Downing (2001), we view these modifications as conveying interpersonal speaker stance, based on reasoning processes that link the mirative assessment to its justification in the preceding context. In (47), the qualification as 'surprising' of the proposition that 'women were attracted to such a rugged life' is justified by the point of the organization being extraordinarily austere and puritanical. In (48), the qualification as 'unsurprising' of the modalized proposition that 'the woman might feel used and turn off' is justified in view of the mercantile view on sex in marriage discussed in the preceding text. We argue that mirativity is located at the top of the hierarchy of interpersonal modifications in terms of its semantic scope as it may apply to either propositions, as in (47), or modalized propositions, as in (48).

(47) … an extraordinarily austere and puritanical organization. *It is a wonder* that any women at all were attracted to such a rugged life. Nevertheless, thousands were. (WB)

(48) A marriage license is not a promise you'll be serviced in sex. With that attitude, *no wonder* she might feel used and turn off. (WB)

In its ability to scope over modalized propositions, mirative modification differs from epistemic modification. In examples like (49) and (50), two epistemic modal markers combine to modify the proposition, whereby, as pointed out by Halliday (1970: 331), they may apply either cumulatively or they may simply reinforce each other. In (49), the certainty marker *there is no doubt* and the possibility marker *may* apply cumulatively, that is, *there is no doubt* scopes over *may*, yielding a meaning like 'I insist it is possible' (Halliday *ibid*.), i.e. expressing the speaker's strong commitment to recognizing the possibility of the proposition 'organicism overlaps heavily with illiberal modes of thinking'. In (50), the two possibility markers *there's a chance* and *might* are in concord, expressing a fairly low likelihood of the proposition 'he will play again'.

(49) *There is* indeed *no doubt* that organicism may overlap heavily with illiberal modes of thinking … (WB)

(50) He is 31 and *there's a chance* he might play again, but I cannot give him any guarantees. (WB)

By contrast, in (48) above, the mirative marker *no wonder* does not combine with the modal *might* but expresses the speaker assuming a position of non-surprise to the epistemically modified proposition.

### 4.1.2 Representational deontic and dynamic modality

In this section we consider representational deontic and dynamic modality, which are *internal* to the proposition. Propositions with representational modality express the existence or non-existence of modal states. In contrast with epistemic modality (see 4.1.1), and like interpersonal deontic modality, the choice of positive versus negative modality is constitutive of the subtypes of representational modality. Representational deontic modality (Verstraete 2001, 2007) basically describes the (non)-existence of obligations and permissions. For instance, in (51) the VNP expresses that she 'was not allowed' to stay on, i.e. absence of permission.

(51) I've got an idea that Debbie wouldn't have let that upset her A-levels, in fact; but *there was no question* of her staying on at school to sit them. (WB)

Dynamic modality ascribes such notions as "ability/possibility/potential or need/necessity/inevitability [to] the first-argument participant" (Nuyts 2017: 63), as in (52), or to the whole process-participant configuration, as in (53).

(52) several hours after the treatment he still felt in an excitable state and *had need* to talk with a close friend. (WB)

(53) *There is no need* that "hello/goodbye" kisses … should diminish with the years. (WB)

These represented modal states are processes deictically located in time within the proposition. They may be realized by modal auxiliaries with limited deictic tense contrasts (present/past) such as *will/would, can/could.* They can also be realized by periphrastic secondary auxiliaries such as deontic *be required/permitted to,* etc. and dynamic *be able/possible/willing, have need to*, which can take the whole range of tenses. In (52) *had need* describes the past need of the subject. The lexical predicator, e.g. *to talk* in (52), designates the process that complements the representational modality, which Palmer (2001) terms the 'potential event'. This 'potential process' incorporates systematic choice of polarity. One can, for instance, be willing to wage war, as in (54a), or be willing not to initiate war, as in (54b).

(54) a. He's willing to wage war. (WB)
    b. He's willing not to initiate war. (WB)

Representational modalities can also be realized by impersonal clause expressions like *there was no question of her staying* (51), which expresses past absence of permission, or *there is no need that ... kisses ... should diminish with the years* (53), in which present absence of necessity is ascribed to the whole process-participant configuration as part of a gnomic statement.

In conclusion to Section 4.1, we give a simple visualization of the interpersonal modifications and their different semantic scope as well as the representational modalities and their complements in Figure 6.

| interpersonal modifications | scoping over |
|---|---|
| | (+/–) mirativity         > modalized (+/–) proposition or (+/–) proposition |
| | (+) epistemic modality   > (+/–) proposition |
| | (+/–) deontic modality   >   (+/–) process |
| representational modality | propositions representing   (+/–) deontic modality of (+/–) process<br>(+/–) dynamic modality of (+/–) process |

Figure 6. Interpersonal modifications and representational modalities

## 4.2 Semantic scope of interpersonal modifications and complements of representational modalities

We now have a semantic model to analyse the various grammatical meanings of the VNPs and to address the great range of 'complement' types they can take. Table 4 reprises the information given in Table 3, but breaks it down per qualificational category rather than per shell noun. To further flesh out the whole picture, some additional examples are given in (55)–(59).

(55) But weathermen insisted *there was no chance of a white Christmas*. (WB)

(56) Mandeville pushed her further down the gallery. "Sir," Benjamin intervened, "the woman is your prisoner, *there is no need for such rudeness*." (BNC)

(57) *There is no way, repeat, no way, you're going to go charging after those people in Costa Rica* until we've laid this all out in front of Richie Cagnia and the SAC in New York. (WB)

(58) Collins confirmed that he is interested in signing defender Brian Shelley and striker Trevor Molloy of Bohemians – but not yet. [...] "And *there*'s *no need to pay Bohemians a transfer fee at the moment* [..]." (WB)

(59) Despite the speculation there have been no inquiries from any clubs regarding Alex. "We would like it to remain that way as we *have no need to* change the management team." (WB)

| Type of qualification | PP (ASE) | *to*-infinitive | *of/for* + gerund | *that*-clause | *if*-clause |
|---|---|---|---|---|---|
| Mirative | — | — | — | (17), (47), (48) | (34) |
| Epistemic | (55) | — | ✓ | (14), (15), (16), (49) | — |
| Interpersonal-deontic | (56) | (12) | ✓ | (57) | — |
| Dynamic | (32) | (13), (59) | ✓ | (53) | — |
| Representational-deontic | ✓ | (58) | (33) | ✓ | — |

Table 4: Semantic scope of interpersonal modifications and complements of representational modalities

VNPs expressing mirativity, (*no/a wonder*), scope over presupposed propositions, which can be expressed only by finite clauses, in which either a declarative implies 100% commitment to the proposition, e.g. (17), (47), or epistemic modal markers express the odds of occurrence of a temporally located process, e.g. (48).

VNPs expressing epistemic modality modify a proposition, i.e. a representation of occurrence or non-occurrence of a process located in time. This proposition is often coded by finite clauses whose tensed VPs explicitly code the temporal location, as in (14), (15), (16). If a VNP combines with a modal

auxiliary, as in (49) *there is no doubt + may*,[15] then, as noted in 4.1.1 §3, the temporal location of the process has to be inferred, taking into account the non-finite tense system, which contrasts *(may) overlap* in (49) (simultaneity with the speaker's time of utterance) with options such as *(may) have overlapped* (anteriority), and *(may) be going to overlap* (posteriority) (Halliday 1970: 337). The proposition may also be conveyed by *of* + gerund, e.g. *there is no chance of this coming about* (WB), where the gerund likewise chooses from the non-finite tense system (compare with *this having come about* and *this going to come about*), thus constraining the interpretation of the deictic location. Finally, the proposition may be conveyed by *of* + NP denoting an action, state or event, e.g. *there was no chance of a white Christmas* (55), where the temporal location is wholly a matter of contextual inference.

VNPs conveying subjective deontic modality have a purely potential process in their scope which is not located in deictic time. The process is often expressed by infinitives, as illustrated in (12) *you have no need to kneel*. In (57) the speaker's emphatic negation *there's no way* combines with the potential action intended by the hearer, *you are going,* thus conveying the speaker's emphatic prohibition ('I don't give you permission to go'). Potential processes can also be realized by *of/for* + NP denoting an action, e.g. *rudeness* in (56)*,* or by *of* + gerund. The deontic meaning of (56) can be paraphrased as 'You shouldn't be so rude'. In contrast with the nominal complement *a white Christmas* of the epistemic qualification in (55), no deictic location is inferred for the process denoted by *rudeness* in (56).

Dynamic modalities are proposition-internal qualifications which are situated in time. The temporal location may be explicit, as in (32) where the impossibility *had no chance* is located in the past, e.g. (32) *Surgeons thought Carl Sutton had no chance of survival when his heart stopped beating for 12 minutes after a 30ft fall*, or it may have to be inferred, if realized by a non-finite VP, as in (60), where the present participle *having no need* expresses simultaneity with the past time location (*was*) in which the narrative is set.

(60)    He was a rather staid man of melancholy mien who had been called to the Bar but had never practised, *having no need* to do so. (WB)

With the VNPs studied here, the potential processes are most commonly coded by non-finite forms, like *of* + gerund, *of* + nominalized complement, e.g. *he had no chance of survival* (32), or *to*-infinitive, e.g. *she had no way to deal with such anxiety* (13). Note that the non-finite tense system is not operative here: the potential processes do not have any tense variation (Halliday 1970: 339). We do not find *\*she had no way to have dealt / to be going to deal with such anxiety*. VNPs with impersonal existential clauses expressing dynamic modality can also combine with a finite clause, provided it depicts a potential event, as marked by *should diminish* in (53).

Representational deontic modalities are likewise proposition-internal qualifications. The potential process complementing the deontic qualifications can be realized by the same set of complements as those found with dynamic modal qualifications. That is, they are most commonly coded by non-finite forms like *of* + gerund in *there was no question of her staying on at school to sit them* (33) and nominalized complements*,* expressing absence of permission, or *to*-infinitives, e.g. *there's no need to pay Bohemians a transfer fee at the moment* (58), which expresses absence of obligation. Infrequently, objective deontic modalities may be expressed by VNPs with a finite complement clause, which, however, will not depict a temporally located process, as in *there is no need that he pay*, which features a subjunctive.

We can conclude that the range of complement types found with each qualification is not random, but is, as we hypothesized, motivated by the semantic scope of the interpersonal modifications and the complement types of the representational modalities.


## 5. Structural analyses

In the previous section we surveyed the qualifications that can be expressed by the VNPs with *way*, *chance*, *need*, *doubt*, *question*, and *wonder*. We distinguished the qualifications that are part of the representational organization of the utterance, from the interpersonal qualifications, in which the speaker "enters into the communication" (Halliday 1970: 325). In this section, we will, assuming the main tenets

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[15] As noted in 4.1.1 §3, *may* is part of the modal modification.

of McGregor's Semiotic Grammar, propose structural analyses of the qualificational uses of the VNPs and relate them to the structures in which the shell nouns are used lexically. Crucial to this endeavour is the idea that representational and interpersonal relations are coded by fundamentally different types of structures. This idea was first suggested by Halliday (1981) and then systematically developed in McGregor's (1997) Semiotic Grammar. We will first deal with the representational structures, which include both the structures in which the nouns are used lexically and the representational modifications. We will argue that they can all be modelled in terms of the traditional dependency structures of modification and complementation, in which elements of structure are added to each other to build a representation (Section 5.1). We will then turn to the interpersonal qualifiers and argue that they are best modelled in terms of McGregor's (1997) notion of interpersonal modifiers, which are not added to the other elements of structure, but which change and mould the content in their scope.

## 5.1. Representational structures involving lexically used shell nouns and situating qualifications

When units are combined to form a representational structure, "one unit expands on the other, adding further details, providing … a more complete representation of some referent" (McGregor 1997: 210). The representational structure of the NP builds a representation of an entity, while the representational structure of the clause builds a representation of a temporally located process. To model the way in which representational elements of structure combine with each other, we invoke the two main types of traditionally recognized dependency structure, modification and complementation. Dependency relations are, as Hudson (1984: 94) puts it, sister-sister relations. They are structural relations between units which are in some sense sisters, i.e. between which a direct relationship obtains, not one mediated by a shared mother, as in constituency. Langacker (1987) elucidates the conceptual motivation for the sister-sister relations in modification and complementation as follows. In modification, the modifier has an inherently relational meaning and is conceptually dependent on the head. Typical head-modifier relations are exemplified by the relation between nouns and their pre- and postmodifiers. By contrast, in complementation, the head is conceptually dependent, i.e. semantically incomplete. Typical heads of complementation relations are verbs and prepositions, which are traditionally said to have valency. The meaning of such heads can only be conceived of by including in their conceptualization the entities to which they make schematic reference, e.g. the entities participating in the process with the inherent roles defined by the lexical verb (Langacker 1987: 277f). In both types of dependency, the head designates the same thing as the whole dependency structure it is part of, but this plays out differently in modification and complementation (Langacker 1987: 288–289). As an example of modification, we can consider nouns and head noun–modifier structures, which both designate entities, with the modifier adding further semantic specifications. For complementation, we can think of verbs, which designate processes that make schematic reference to participants, which are then specified by NPs and prepositional phrases. Following the convention used by Hudson (1984), both types of dependency relations will be represented by an arrow arc pointing from head to dependent.

The three main types of constructions associated with *lexical* uses of the six nouns were discussed in Section 3. They are: complex NPs with embedded clauses, composite predicates, and complex sentences.

Complex NPs with embedded clauses may be either postmodifying relative clauses, as in *two ways in which he'd attempt it* in (61) or complement clauses as in *his chance to shine* in (62).

(61)    … one of those was the problem of an over-centralized centre of planned economy. Now Khrushchev had striven to reform that and we can pick out *two ways in which he'd attempt it*. (WB)

In NPs with restrictive relative clauses, the relative clause modifies the nominal head, thus restricting the type of entity designated by the head (Langacker 1991: 430–434), e.g. 'ways in which to attempt reforming an over-centralized planned economy' in (61). The resulting composite structure is then modified by the determiner, which in (61) is *two*, counting two instances of the type. This semantically motivated structural assembly is visualized in Figure 7.
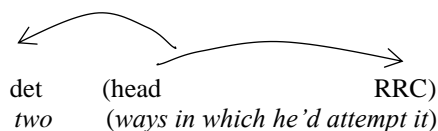
```
        ⤺                    ⟶
   det      (head          RRC)
   two    (ways in which he'd attempt it)
```

Figure 7. Modification relations in complex NP with restrictive relative clause

(62)  Ex-Cumbernauld Juniors striker Crawford was handed *his chance to shine* when Leigh Hinds limped off with an ankle knock after 17 minutes. (WB)

In (62), the embedded clause stands in a complementation relation to the head noun *chance*. *Chance* is the nominalization of a stative relation, 'have the chance', which makes schematic reference to both an agent and a patient, 'agent X's chance to do act Y', which enables it to bind a clausal complement. The agent can be coded by a genitive or possessive determiner, functioning as a premodifier (Davidse 2018). The structure of the NP in (62) is visualized in Figure 8.

```
        ⤺                       ⟶
   det      (head        complement clause)
   his    (chance            to shine)
```
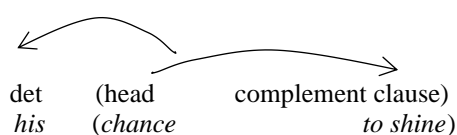
Figure 8. Modification and complementation relations in complex NP with complement clause

The second type of construction in which shell nouns are used lexically is a composite predicate formed with light verbs such as *have*, e.g. *to have need* in (63), which has roughly the same meaning as the corresponding simple predicate *to need*. In (63) the process *have need* has two participants, the 'needer' *you*, and the 'needed' *it*. We follow Langacker (1987) in interpreting the relation between process and participants in terms of complementation, whereby the lexical predicate is the clausal head while the nominals participating in the process are the complements.[16] A lexical predicate makes schematic reference to the participant roles that are essential to its conceptualization, as recognized in the traditional notion of verb valency. A transitive predicate like *need/have need* makes reference to the agentive and patientive entities participating in this process. Importantly, the predicate semantically imposes these roles on the elements that code the participants. *I* and *it* in (63) do not simply refer to entities, but to entities 'needing' and 'being needed'. It is precisely because the semantics of the verb 'rub off' on NPs and PrepPs as agentive and patientive participant roles in the process that we analyse this structural configuration in terms of complementation (for further discussion, see Laffut & Davidse 2002). The complementation structure of (63) is visualized in Figure 9.

(63)  "I can spare you thirty quid," she said briskly, "and a coat, and a hat too, if you *have need of it*." (WB)

```
        ⤺                        ⟶
 NP complement   clausal head    PP complement
                 lexical verb
     you          have need         of it
```
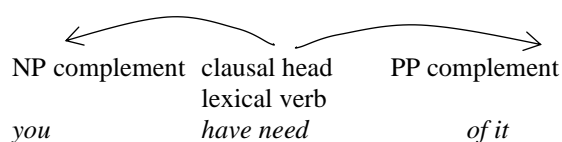
Figure 9. Complementation structure of process-participant configuration

The third structure associated with lexical uses of the nouns studied is a complex sentence with an internal complementation relation. Example (64) is a reporting construction in the context of discussion between a coach and the referee of a soccer match. The impersonal matrix *there was doubt* conveys the

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[16] By contrast, McGregor (1997), like Halliday (1994), models the relations between the lexical verb and the NPs coding the participants in the process in terms of constituency.

main point of the utterance, i.e. the coach raised a question with the referee, and is discourse-primary. The content of the question is reported in the *if*-clause.

(64)    *there was doubt* if a try was scored. (WB)

Vandelanotte & Davidse (2009) follow Halliday (1994) and McGregor (1997) in viewing the whole reporting clause, not just the verb, as the head of reporting constructions. It is the whole represented speech act that makes schematic reference to 'what was said', and that provides the deictic coordinates, with reference to which the deixis of the report has to be interpreted. In other words, the reporting and the reported clause are the primary constituents between which the relation of complementation obtains. Figure 10 represents the complementation structure of (64).

head              complement
reporting clause    reported clause
*there was doubt*    *if a try was scored*
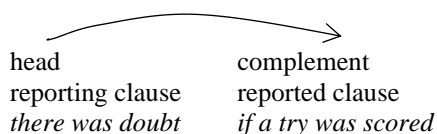
Figure 10: Complementation structure of reporting construction

We now turn to the representational qualifications that can be expressed by VNPs, objective deontic modality and dynamic modality. As we saw in Section 4.1.2, these are *grammatical* qualifications that are part of the *representational* organization of the sentence. They are most commonly expressed by auxiliary uses of VNPs, e.g. (65), on which we will concentrate here.

(65)    They *had no need to drink*. (WB)

In (65), *had no need* locates the subject's absence of any need *to drink* at a specific moment in the past. *To have no need* is a secondary auxiliary, equivalent to *not to need*. The lexical predicate *to drink* is dependent on *have no need* (cf. Halliday & Matthiessen 2004: 505–514). *Have no need* cannot be conceptualized without adding in 'what is needed' and imposes this semantic role on *to drink*. We hence analyse the relation as a complementation structure visualized in Figure 11.

head              complement
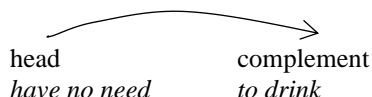*have no need*      *to drink*

Figure 11. Complementation structure within complex VP

These structural analyses allow us to capture the diachronic shifts from lexical uses to situating qualifications. For a number of the shell nouns, complex NPs with complement clauses are the source of lexical composite predicates. This path was found, for instance, for *question* (Davidse & De Wolf 2012). Complex NPs with determiner and prepositional phrase complement, e.g. *a questioun was maad of Jonys disciples with the Jewis, of the purificatioun* (PPCME, 1350–1420), were the source of the lexical composite predicate *make question*, complemented by an interrogative, e.g. *tei mad question to what entent tei schuld rise* (PPCME, 1420–1500).

Lexical composite predicates are, in their turn, the source of secondary auxiliaries expressing objective modality. For instance, in the lexical predicator use in (63), *have need* is complemented by an NP and a PP expressing the participants in the process (Figure 10). But as secondary auxiliary, as in (65), *have no need* is complemented within the VP by a lexical verb *to drink* (Figure 11). While the meaning of *have (no) need* becomes more general and schematic in the shift to secondary auxiliary, it remains part of the representational organization of the clause. This explains the persistence (Hopper 1991: 22) of meaning between the lexical and grammatical use of *have (no) need* in examples like (63) and (65).

## 5.2. Interpersonal modifying structures

In this section, we propose to model mirative, epistemic and subjective deontic qualifiers in terms of McGregor's (1997: 221) concept of interpersonal modification. The types of units and the relation between them differ from the traditional head-modifier relation, which builds a representational structure, as can be illustrated with examples of NPs. In representational modification, the modifier is *added* to the head, thus building a more elaborate representation, which is computed compositionally, e.g. *empty*<sub>modifier</sub> *trains*<sub>head</sub>. By contrast, an interpersonal modifier qualitatively *changes* the representational meaning of the unit it relates to, as in *a complete idiot*, where the degree modifier *complete* changes the degree of that unit's gradable features, i.e. the idiocy of the person in question. The analogy between a degree modifier and, for instance, epistemic modification is obvious. Epistemic modality modifies straight propositions, which express either occurrence or non-occurrence of a temporally located process as such, into a statement conveying the probability of occurrence versus non-occurrence. On the theoretical tenets of a semiotic grammar, the way in which an interpersonal modifier syntagmatically combines with the head cannot be modelled by the traditional dependency structures. Rather, McGregor (1997: 209) argues, in 'interpersonal modification', "a unit applies over a certain domain, leaving its mark on the entirety of this domain" (1997: 210). An interpersonal modifier is not added to a head, but overlays its 'domain', to which it stands in a *scoping* relation. McGregor (1997: 64–65) defines the concept of 'scope' in a different and broader sense than in the formal semantic tradition, where it is used, for instance, to distinguish the different interpretations of propositions resulting from the different scopal relations between quantifiers used in them. McGregor (1997: 210) uses the notion of a scoping element and the unit scoped over to characterize syntagmatic relations in which "one unit 'shapes' the other, indicating how it is to be taken or viewed by the addressee". Importantly, the head-dependent asymmetry associated with representational structures is thus reversed in the interpersonal modification structure, in which the scopal domain is the primary building block, which is changed by the interpersonal modifier. We see exactly this 'reversal' with the discourse primary use in *there was doubt if a goal was scored* in (64) and the discourse-secondary use of the VNP in (66b) *There is no doubt United will be up there again this season.*

In this section, we will argue that the three types of interpersonal qualifications which we discussed in Section 4.1 all involve interpersonal modification. The fit of McGregor's (1997: 209–251) approach with the phenomena we seek to model is obvious as interpersonal modifiers scoping over processes and propositions may be realized by very diverse grammatical categories including clauses, adverbials, auxiliaries and verb inflection. McGregor (1997: 64–70) visualizes scoping relations by boxed representations, with the interpersonal modifier enclosing the changed unit, for instance a proposition or a process.

Mirative and epistemic qualifications occupy the upper ranks as they scope over propositions. In the data considered in this article, these qualifications can be realized by parenthetical clauses (a), discourse-secondary matrices (b), or adverbials (c), as illustrated in (66).

(66)   a. United will be up there again this season, *I have no doubt*. (WB)
       b. *There is no doubt* United will be up there again this season.
       c. *No doubt*, United will be up there again this season.

The scoping relation between the interpersonal modifiers and the proposition in (66a–c) can be visualized as in Figure 12 (McGregor's (1997: 229).
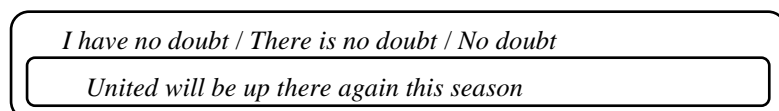


Figure 12: Interpersonal modification structure of epistemic qualification

This structural analysis bears some resemblances to that proposed by Boye & Harder (2007: 581–586) for grammatical CTP-clauses, which they analyse as an "adverbial CTP-clause" (see Section 1). They note that secondary CTP-clauses, be they structurally a matrix or a parenthetical, "serve a modifying function in relation to the (complement) clause they are attached to" (2007: 586). As in the analysis

proposed by us, some sort of shift from complementation to modification is posited (see Section 1). However, Boye & Harder (2007) do not explicitly point out the distinctive structural-functional combinatorics of interpersonal modifiers, which, as per McGregor (1997: 210), structurally scope over a unit (rather than being added to it), qualitatively changing this unit.

Subjective deontic qualifications are typically realized in our data by VPs with auxiliaries and second person subject, as in (12) *You have no need to kneel before me*. *Have no need* functions as a primary, grounding auxiliary here, functionally equivalent to the NICE modal *needn't*, which scopes over a process not located in time. *Have no need* is thus an interpersonal modifier, whose relation to the process is visualized in Figure 13.


*have no need to* (I cancel the obligation to)
*you*                                                      *kneel before me*
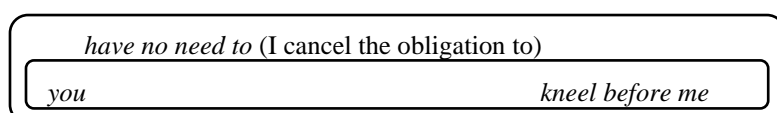
Figure 13: Interpersonal modification structure of deontic qualification

The proposed types of interpersonal modification allow us to capture the two main paths of grammaticalization towards new expressions of modal meaning by VNPs. The first path is from the discourse primary (Figure 10) to the discourse-secondary status (Figure 12) of clauses like *there be (no) doubt*, which involves structural re-organization of the way the two clauses relate to each other in the complex sentence. The representational structure linking head to complement shifts to the interpersonal structure linking an interpersonal modifier to its scopal domain. This reverses the asymmetry between the two units. In the representational complementation structure, e.g. (64) *there was doubt if a try was scored*, the matrix is the primary building block, which conveys the question raised by the coach about the referee's adjudication. In the interpersonal modification structure, e.g. (66) *United will be up there again this season, I have no doubt*, the primary building block is the proposition, which is scoped over by the interpersonal modifier of certainty *I have no doubt*. The second grammaticalization path is that of auxiliarization, which runs from composite lexical predicates, as in (8) *he would not have need of a car for long,* over representational secondary auxiliaries like (65) *they had no need to drink* to speaker-related auxiliaries like (12) *you have no need to kneel*.

In a final note, we briefly contrast our views of the grammatical analysis component in grammaticalization with the views of Trousdale (2012) and Boye & Harder (2012) touched on in Section 1. Following Halliday (1961), Langacker (1987) and Croft (2001), we adhere to the premise that grammatical classes like verb or noun are not primitives. Rather, the whole construction defines its elements of structure, which in turn have a motivated relation to the grammatical classes realizing them. Grammaticalization can then be seen to often involve a type of coercion, i.e. the realization of grammatical functions by incongruent grammatical classes. As noted in Section 1, a class-based structural analysis often does not do justice to the coercion and re-analysis involved in grammaticalization. We illustrated this by contrasting Trousdale's (2012) structural analysis of *a lot of trees* as [[NP1 *of*] NP2] with Brems's (2003, 2011, 2012) analysis as a quantifier-head structure.

In accordance with the general outline of Semiotic Grammar, all the representational and interpersonal structures discussed in Section 5 are meaningful grammatical structures. In Langacker's (2021) terms, structural assemblies symbolize grammatical functions, which are inherently relational, e.g. head *of* complement, modifier *of* head. Now, Boye & Harder's (2012: 6–7) definition of grammar as secondary and ancillary to lexical elements appears to net only structures involving a separate grammatical element as 'grammatical', and to exclude structural relations between lexical elements that are not overt. Thus, they would presumably not recognize 'grammar' in the way in which (63) *you have need of it* is put together, whereas we argue that its structural integration in terms of head and complements does constitute meaningful grammatical patterning. In a semiotic grammar approach, it is hence imprecise to call, for instance, the discourse-primary use of the first clause in (9) *there was doubt if a try was scored*, merely a 'lexical' use, as this clause is itself structurally assembled, with its internal complementation structure contributing meaning. If such conceptually motivated structural assemblies are not recognized, then a number of functional-structural shifts on grammaticalization paths will also be missed. Within the representational structures discussed in Section 5.1, we can make a distinction between those whose head is a lexical item (Figures 8 and 9), or contains a lexical item

(Figures 10 and 11), and the representational structures whose head is a secondary auxiliary (Figure 12). With the interpersonal qualifications in Section 5.2, the grammar dimension resides in the structural relation between scoping modifier and scopal domain as well as in the internal structure of these two composite structures (Figures 13 and 14).

## 6. Conclusion

The aim of this article was to develop a framework for the analysis of modal qualifications as coded by both canonical modal markers and grammaticalized expressions within a 'semiotic grammar' approach (McGregor 1997). The central semiotic tenet is that the form of grammatical signs, irrespective of whether they are long entrenched or have more recently been formed by grammaticalization, relate naturally to the meanings they encode. By closely charting the coded meanings, we can also identify inferred and implied meanings with greater precision. As case study for the grammaticalized signs, we took the verbonominal patterns (VNPs) with the shell nouns *chance*, *doubt*, *question*, *need*, *way* and *wonder* for reasons outlined in Section 2. From the semantic end, these VNPs raise all the issues that we wanted to address, viz. the difference between epistemic, deontic and dynamic modality and the available options of polarity within these types. From the grammatical end, they present us with considerable structural variation, within which we wanted to formulate the two main grammaticalization paths, viz. auxiliarization and the shift to discourse secondariness of the erstwhile matrix clause.

In Section 3, we inventoried the constructions in which the six shell nouns function with a lexical meaning and the constructions in which they are part of VNPs expressing modal meanings. This inventory laid the basis for insight into the two grammaticalization paths. Firstly, *have (a/no) way*, *chance* and *need* can function as lexical composite predicates or as auxiliaries. In the latter function they express either the presence or absence of dynamic modal notions like opportunity, ability, need and necessity. The shift from discourse-primary to discourse-secondary uses of the matrix in complementation constructions constitutes the second grammaticalization path: *there be no doubt/ question/ chance* have come to express strong likelihood, *it be no wonder* expectedness, and *there be no need* absence of need or necessity.

In Section 4, we focused on the semantics of the modal qualifications, ranging them in terms of two hierarchies. The different types of modal qualification were ranged in such a way that the ones higher on the hierarchy, interpersonal modifications, scope over the qualifications lower on the hierarchy, the representational modalities. We also put the different units scoped over by the interpersonal modifications and the complement types of representational modality on a complementary hierarchy.

Finally, in Section 5, we proposed structural analyses of the interpersonal and representational qualifications within the broad outlines of McGregor's (1997) Semiotic Grammar, stressing the semiotic significance of different structural assemblies such as complementation, representational modification and interpersonal modification.

As this article is synthetic in nature, further more detailed research can follow a number of tracks. Descriptively, inventories of modal markers in grammar books have to be expanded to include 'periphrastic' realizations such as those studied here. Theoretically, the question could also be raised whether we should continue to approach the field of modality in English by taking the so-called core modal auxiliaries as norm, even though they are often not the most frequent realization. Further insights might be gained if we approach modality from multiple perspectives, paying, for instance, more attention to the clausal realization of modal qualifications, which code certain aspects more explicitly, like the temporal location of the process scoped over.

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