MODULATING ATTITUDES VIA ADVERBS:
A COGNITIVE-PRAGMATIC APPROACH TO
THE LEXICALISATION OF EPISTEMOLOGICAL EVALUATION

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1. *Introduction*

Propositional attitudes represent a highly debated topic within the philosophical semantic tradition of research, as well as within the truth-conditionally oriented branch of semantics, and they have persistently provided very lively and problematic areas for discussion.

Although *propositional attitudes* is a general term indicating attitudes of various sorts towards the propositional content of the sentence, this "label" has been commonly used to refer to the attitudes encoded by verbs like *believe*, and *know*, and it has been increasingly identified with the domain of epistemology and belief.

Despite the considerable attention devoted to the problems arising from the presence of these verbs in report contexts, very little has been said about the linguistic semantics of these lexical items and their role in ordinary communication.

The philosophical literature resorts systematically to *know* and *believe* for the exemplifications, and (very rarely) to few other verbs such as *suppose*, *think* and *doubt*.

The non-truth-conditional semantic literature has not been very generous either, with very few exceptions focusing specifically on these verbs (Lehrer 1974; Nuyts 2001).

What is interesting, though, is that there is a general agreement relative to the fact that these verbs lexicalize certain attitudes, which, after having been largely neglected by linguists, have recently been recognized to be fundamental for meaning retrieval and understanding (Bertuccelli Papi 1998, 2000).

2. *The important role of attitudes in inferential communication*

2.1. *Attitudes as source of meaning*

Among human beings, in the absence of any particular impairing disease, the ability to communicate is usually taken for granted: it is considered as natural as walking or seeing. But it is in fact a very complex task, whose functioning has not yet been totally explained.

In the 80's, Grice's analysis of communication gave a new direction to the linguistic and philosophical investigation of communicative processes, by introducing the idea of communication as a form of rational behaviour: a process essentially involving the expression and recognition of intentions (Grice 1989).

The focus was shifted from the code itself to the conditions under which it can be correctly interpreted, and the speaker and his communicative intentions were given a prominent position. Understanding utterances no longer meant *decoding:* it meant *interpreting* utterances *intentionally* produced by an *utterer* in a conversational *context.*

Grice's hypothesis substituted the classical *code model* of communication, according to which speaker and hearer share a common code that is used to encode and decode messages, with an *inferential model* of communication, in which a speaker displays evidence of his intention to communicate and the hearer infers the intended meaning on the basis of the displayed evidence. Within this framework, utterances are "a linguistically coded piece of evidence", which preserves an element of decoding in the overall picture of verbal comprehension.

However, the information retrieved from the linguistic code is usually very different from the meaning that the speaker intends to communicate. Building on the decoded logical form of the sentence, a hearer who wants to retrieve the intended meaning needs to undertake a non-demonstrative process of pragmatic inference, which will eventually lead him to recover what the speaker meant and implicated (Carston 1997, 2002, Sperber & Wilson 1986/1995, 2002 Wilson & Sperber 1993, 2002). In this sense, pragmatic interpretation is first of all a type of "mind-reading activity", aimed at the inferential attribution of intentions (Sperber & Wilson 2002) and comprehension is an essentially inferential process, where many contextual values are actually supplied only on pragmatic grounds (Carston 2000). Almost every component of the interactional context is potentially capable of conveying informational stimuli, so that the hearer can choose the most relevant one and derive

the most adequate interpretation. In this process, the role of the participants is essential: neither the speaker, nor the hearer has a more important role than the other. Communication is a "joint venture based on the negotiation of meaning" (Bertuccelli 42:2000): the speaker displays and encodes to various degrees of explicitness information, intentions and *attitudes;* the hearer needs to select the most relevant ones for the purpose of the interaction.

This entire process involves very complex pragmatic principles, which come into play, not only in the derivation of the higher-level unarticulated components, but also at the lexical level.

The role of the participants is very prominent and, if we agree with Bierwisch's (1980) proposal that the speaker's presence is so inalienable that it must be marked somehow in the logical representation of utterance meaning, we can conclude with Bertuccelli (2000) that, an "attitude component" (ATT) is the best way to represent his presence. Moreover, if we are to consider the speaker as part of the interactional situation as a whole, intentions cannot possibly exhaust the contents of such a component. Therefore, in order for the role of attitudes to "be integrated as an essential component of the communicative process" (p.44), it is necessary to spell out their nature and typology.

In line with Bertuccelli (1998, 2000) attitudes are here defined as "a type of mental disposition" capable of `colouring' the whole utterance and positioning the speaker with regard to "the status of the information that is being communicated in terms of both cognitive and socio-emotional evaluations".

We could go further than this and say that attitudes are not just one of the many relevant contextual elements that hearers have to take into consideration while pragmatically deriving the speaker's intended meaning. They are themselves a source of meaning and therefore, they go beyond any intentional ostensive stimuli. Intentionality is not, in fact, the only element guiding the hearer. He can choose to focus on other components identifying the speaker in the communicative process, and I take attitudes to be some of them. This fundamental role played by attitudes is plausibly universal, regardless of the language spoken, given the universal nature of the human cognitive apparatus.

It is in fact hypothesizable that the propositional form is not the only `start' for inferential processes. Attitudes, as pre-reflexive mental states, can determine and orient the inferential processes of the mind providing an evaluative schema, which works as a pattern for the encoding of meaning (for the speaker) and as a guideline for the interpretation of meaning (for the hearer) (cf. Calabrese 1987, Bertuccelli 2000). In fact, once the attitude associated with an utterance has been identified by the interlocutor, it becomes an ideal index pointing towards the right interpretation that the utterance must receive.

2.2. *Attitudes and lexicalization: a dynamic perspective*

This "pointing function" is even more evident when attitudes are explicitly *lexicalized.* Following Carston (2002) and Croft and Cruse (2003) we can consider lexical items to function as an "access node" into the knowledge network, an idea which is very close to the "word-as-a-pointer-to-a-conceptual-region", proposed by Carston's "online *ad hoc* concept construction theory". Such a hypothesis sees the dynamism envisaged in communication as pervading all levels of language and therefore also the level of lexical meaning.

Lexical items offer access to encyclopaedic knowledge, which is accessible to different extents at different times, and this determines the selection of different "subsets" for different contextual circumstances and, consequently, of the specific interpretation of the word depending on such contextual circumstances.

In this perspective, words undergo pragmatic processes of lexical narrowing and loosening of their meaning, so that the encoded concept is construed *ad hoc* by the hearer in the comprehension process as a response to a certain expectation of relevance in a context.

Rather than positing that words encode concepts, it can be hypothesized that what is `encoded' by lexical items is rather something different, less defined such as concept schemas, or pointers to a conceptual space, on the basis of which, on every occasion of their use, an actual concept is pragmatically inferred. Words could then be considered to work as pointers to `conceptual addresses' in our memory which are attached to encyclopaedic (and presumably also logical and lexical) information: according to contextual and cotextual circumstances, we select a part of this information.

A similar position finds support also in Croft and Cruse's (2003) *Dynamic Meaning Construal* hypothesis. Under this perspective, language is not considered to be an autonomous cognitive faculty, rather, grammar is conceptualization and knowledge of language emerges from language use. The meaning construal depends strictly on the context in which a word is used, both intended as linguistic context and context of utterance. The information that builds our knowledge of the world is seen as totally interconnected and word meaning is "a perspective" on it, "as seen through the concept profiled by the word". When a speaker chooses a word to convey a meaning, he builds a relationship between the experience that is communicated and the hearer's existing knowledge, via the conceptualization of experience.

Our experience would, thus, be unconsciously structured through *construal operations* in order to be communicated and such linguistic operations reflect the more general cognitive processes described in the psychological literature

(see also Nuyts's (2001) notions of language *depth* and *dynamism)*.

Croft and Cruse (2003) claim that "past history" ("accumulated memories of previous experiences"), "recent history" ("immediately preceding mental activity") and "current input" ("a construal of immediate context, including linguistic, perceptual, social, psychological aspects, including current goals and plans, inferences and expected outcomes, perceived causal relations and so on") all concur to the creation of concepts.

The meaning retrieved from words in context of actual use can be seen as a *contextualised interpretation* of the lexical item's *purport, (i.e.* the "indeterminate starting point", which is probably the stable part of the meaning of a word).

To sum up, a dynamic theory of meaning is based on the idea that when a word is uttered in a particular context as intended above, it functions as a sort of pointer towards an essentially pre-propositional entity, its *purport,* or *semantic potential,* which is transformed by a series of processes of construal, according to contextual and cognitive constraints, into a fully contextualised interpretation. In this sense, verbs of propositional attitude like *believe* would point towards the dimensions involved in the epistemological evaluation of states of affairs, making explicit the attitudes of the evaluator. This conceptual domain is most likely universal and shared by all human beings, the assessment of the "existential status" of "data" being fundamental in order for human beings to be able to cognize reality, as I will try to illustrate below.

The strict relation between language and conceptualization envisaged here makes it plausible to hypothesize that the cognitive organization of this conceptual dimension is somewhat reflected in the linguistic semantic behaviour of these lexemes, bringing closer together cognitive-pragmatic and lexical semantic considerations.

3. *(Belief) Attitudes and the Modular Mind*

Grice never wrote anything explicit about the collocation of human pragmatic abilities within the overall architecture of the mind. He supported the idea that human communicative behaviour is rational and that the comprehension process in particular involves the cooperation of pragmatic abilities and of other mind-reading devices.

This finds support in some relatively recent developments in the domain of the cognitive sciences, and in particular in psycholinguistics and in developmental and evolutionary psychology.

Sperber (2000:117) writes:

"Just as bats are unique in their ability to use echolocation, so are humans unique in their ability to use metarepresentations"

His account of metarepresentation is based on the hypothesis that humans can entertain intuitive and reflective attitudes, which make their cognitive system unique.

Like every organism with a cognitive system, humans too must have a sort of database, a "belief box", as Schiffer (1981) defined it, where they store mental representations of actual states of affairs. Sperber (1997) calls these first-order representations "intuitive beliefs": they are represented in the database in such a way that they can be simply treated as data and used as premises in inferences. He represents this kind of belief as Bel(P).

Sperber hypothesizes that propositional attitudes in general can be represented in different ways, but he holds that intuitive beliefs are the most fundamental category of cognition.

However, what makes human cognition unique is that humans can "metarepresent representations", that is, they can have "reflective attitudes", and of course "reflective beliefs". This process is recursive: humans can meta-represent representations and other meta-representations, so that many different attitudes can be entertained towards different orders of (meta-)representations.

Such a mechanism might have favoured the development of metapsychological abilities, allowing humans to perform that "mind-reading exercise" that I have defined as an essential feature of communicative processes.

Meta-representational abilities, and more specifically meta-psychological abilities, would have been made possible by biologically evolved, domain-specific mental mechanisms, exactly like the language faculty.

Such biologically evolved, domain-specific mental mechanisms find an adequate explanation within a modular model of the mind, where modularity is more generalized than in the traditional Fodorian proposal (see Fodor 1983, 2000 vs. Pinker 1997, Sperber 2002, Sperber & Wilson 1986/1995, 1996, 2002; Carston 2000).

In such a model, the metarepresentational abilities described above could, in fact, depend on actual metarepresentational modules (Sperber 2000), which might have adaptively evolved in human phylogeny, such as the *"Theory of Mind Mechanism"* (ToMM), whose metapsychological function would consist in providing the human mind with a "predictive power" over the behaviour of others and which is strongly supported by Scholl and Leslie (1999) also on the

grounds of the evidence gathered from research on autism (Baron-Cohen 1995)1. Their work provides, in fact, support for the hypothesis that, in one to one communicative interaction, the unconscious attribution of attitudes plays a central role, and, although the first "interpretive process" operates at the sub-personal level, the output is made accessible to the level of consciousness2.

In consideration of the fact that humans can meta-represent different kinds of representations, Sperber (2000) argues in favour of a relevance-oriented comprehension module dealing with utterances and ostensive stimuli and which would be an evolved sub-module of the more general metapsychological module, since it would be used to assign meta-representations to the speaker: more precisely, his meaning and his communicative intentions.

This seems very plausible if we accept the view of communication as proposed above, that is as an inferential process which involves putting forward and evaluating hypotheses about the speaker's meaning on the grounds of the "evidence" he provides, this latter being of course linguistic or generally ostensive stimuli. In this sense, comprehension might consist in the application of the mind-reading module to the identification of the speaker's communicative intentions.

Other modules have been hypothesized for which attitude ascription is central. They are "protective mechanisms" such as the logical-rhetorical module (Sperber 2000).

Humans rely enormously on communication. It is in fact a very advantageous tool for them, since they greatly depend on their cognitive resources and communication makes knowledge and experience shareable. It is a useful form of cooperation, but, at the same time, it is also very frail, so exposed as it leaves us to cheating.

Similarly, in 1989, Leda Cosmides proposed the existence of a "cheater detector mechanism", capable of helping calibrate trust and protect from cheaters. She claimed that the form of "reciprocal altruism" humans are endowed with is not stable enough without a proper mechanism to prevent cheating. That complex form of "reciprocal exchange", to say that with Sperber (2000: 129),

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[1] Further support comes from research on language development in children. Very young children seem to be already equipped with domain-specific cognitive mechanisms, and in particular with a general mind-reading capability. Cf. Barkow, Cosmides and Tooby (1995), Sperber & Wilson (2002), Tomasello (2002).

[2] For a detailed discussion of the personal vs. sub-personal levels and their relation to consciousness see also Recanati (1993, 2002).

needs be ensured through some dedicated mechanisms such as the other possibilities which he proposes. On the one hand, a *"logico-rhetorical ability"*, a "protective mechanism" preventing misinformation and checking for the internal consistency of the information communicated and for its consistency with the hearer's knowledge and beliefs. On the other hand, this "consistency detector ability" would be strictly interconnected with another skill scrutinizing "argumentative displays" and finding "fault with them" (p. 130).

To sum up, recent proposals from the cognitive sciences seem to support the fundamental role of attitudes envisaged here as a universal feature of the functioning of human mind and cognition. The human mind seems to be equipped with a metapsychological module made up of several sub-modules. Of these sub-modules, the *ToMM* would be dedicated to the retrieval and the ascription of attitudes, emotions and intentions. Another, the *logico-rhetorical module,* would detect cheating and inconsistencies in arguments, that is, it would deal with abstract representations. The last one, the *pragmatics or comprehension module* would interpret relevant ostensive stimuli, dealing with public representations and with communicative intentions.

3.2. *Concluding remarks*

As it is clear, we view attitudes as an inalienable component in interaction, being so indissolubly part of human nature and individuality as they are. "Verbs of propositional attitude" like *know* and *believe* lexicalize attitudes: they are means for their *expression.* Once attitudes are expressed via linguistic means, the role of the comprehension module becomes more prominent than the role of the other sub-modules, which, however, still have an important role to play in the process, given that the range of mental states that can be expressed verbally is limited compared to those that the human mind can experience.

The cognitive nature of attitudes probably affects the linguistic level as well and emerges at the lexical level. In order to prove or disprove this hypothesis, it is first of all necessary to provide an operational characterization of attitudes and in particular of those concerning the epistemological domain, which, as I mentioned above, is here considered to be a fundamental domain of human cognition.

4. *Towards a characterization of attitudes*

4.1. *Features of attitudes*

Whereas as intuitive and unconscious mental states, attitudes fall under the domain of psychology and psycholinguistics, once they are expressed, they become a proper object of linguistic analysis[3].

They are in fact the manifestation of the speaker's mental states, be that an involuntary process or the reverse, and therefore, they function as "operators" subjectivizing the proposition expressed. Bertuccelli (2000: 218) proposes a radical view of the role of attitudes in meaning construction:

> "Attitudes could (...) be technically translated into operators that turn sentence meanings (propositions) into utterance meanings. This statement is dense with implications. It implies first of all that attitudes turn objective meanings into subjective ones. And it implies that they determine the actual surface form the semantic representation will assume."

Some attitudes can be expressed by syntactic means, like the mood of the verb; other attitudes are better conveyed through lexical means (Sperber & Wilson 1986; Palmer 1979, 1986; Coates 1983). In English, for instance, lexical means for the expression of attitudes are far more numerous than the syntactic ones.

Attitudes can be modulated and the possibility for the speaker to modulate them is provided by the nature of attitudes themselves, which, in line with Bertuccelli Papi (1998, 2000), I consider to be dynamic entities, interacting with the various components of the text and subject to continuous modification and reinterpretation.

> "Three concepts characterize the notion of attitude as we are using it: mental state, subjective evaluation, relational disposition. Moreover (...) attitudes have three main properties: they have an object, they have intensity, they have structure." (Bertuccelli Papi 2000: 227)

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[3] In the linguistic literature, attitudes have usually been dealt with only secondarily as semantic dimensions emerging from the study of some structural categories (such as modal verbs) or of the broad domain of modality, but as we have already mentioned, they have received scarce attention as a definite and fundamental dimension of meaning. Major attention has been devoted only to the categories traditionally analysed within the logically-based semantic tradition (epistemic, deontic and bulomaic attitudes), and with considerable divergences in the different interpretations of the phenomena to include in the three classes. A remarkable exception to this trend in the research is offered by Bertuccelli Papi's (1998, 2000) work, whose proposals are here largely endorsed and provide a steady basis for the present analysis.

The "subjectivizing potential" mentioned above is strictly related to their "relational disposition", that is, the ability which attitudes have to position (both cognitively and emotionally) the participants in the communicative situation with regard to each other and to the object of the communicative act.

Attitudes are gradable and can be ideally arranged over a scale, ranging from a positive pole to a negative pole, with intermediate nuances. The different positions along the scale are determined by different sources or "values", which are subjectively attached to the various representations.

Attitudes are complex and interact with one another. It is rare to encounter a one to one mapping between an utterance and an attitude. Usually, attitudes can interact with each other within the same utterance; they can even be lexicalized in combination in one single lexical item, and all the values determining the ideal position of an attitude along a scale can have more than one vector.

Attitudes are inheritable. We can hypothesize that, once an attitude has been explicitly or implicitly expressed, it pervades all that follows. Presumably the hearer engaged in the comprehension process identifies an attitude and assigns it to all the other propositions until he happens to come across a different "attitude trigger" which provokes a shift. The new attitude, like the first one, is thus extended to what follows, interacting with all the possible successive and previous attitudes perceived to convey the correct understanding of the text. Of course, it is also possible that what is retrieved from the hearer is not just one attitude but a complex set of them, or that only one attitude is relevant for him and therefore worth his attention, or even that the entirety of attitudes expressed by the speaker, interacting with the hearer's mental states, produces a different "reading" from the intended one.

4.2. A *classification of attitudes*

Bertuccelli Papi (1998, 2000) postulates the existence of several categories of attitudes, which can be variously conveyed, either implicitly or explicitly. She recognizes two macro-classes of attitudes: cognitive attitudes and socio-affective attitudes.

The author focuses mostly on the second group, which is taken to include several sub-classes, namely those of rhetoric, emotional and ethic attitudes, and shows their communicative power within an inferential model of communication, whereas the present analysis will hinge on the first group and in particular on the sub-class of epistemic attitudes.

The macro-class label "cognitive attitudes" covers, in fact, different subtypes: alethic, epistemic, deontic and boulomaic attitudes.

Up to this point. I have referred to verbs like *believe* as "verbs of propositional attitude", borrowing this "label" from the philosophical and formal semantic traditions of research. From now on, I will refer to these verbs as *verbs of cognitive attitude,* since this name seems to be more precise and more illuminating relative to their meaning and their functions.

5. Epistemological attitudes: the encounter between subject and reality.

5.1. *The evaluation of a hypothetical "state of affairs"*

As it is evident from all the philosophical discussion, verbs of cognitive attitude express the epistemological stance of the subject.

Whereas the psychological reality of the classical notion of alethic modality[4] is not universally accepted, *epistemic attitudes* are supposed to be a cognitive universal, given the fundamental role of the epistemic evaluation[5] within the overall architecture of the mind. It is thus believed that in any language there must be some means for the expression of this dimension.

It is first of all necessary to try to provide a plausible hypothesis for the internal organization of the more general epistemological domain, which can be considered beyond language specificity and therefore ideally reflected in any language.

In the very rich literature on this subject, the epistemic evaluation is generally

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[4] The term *modality* is not a synonym of the term *attitude,* but it stands in a very close relationship with it. When talking about attitudes, we are dealing with a more abstract, psychological domain. In the present article, *modality* will be used to indicate the linguistic expression of the speaker's attitude. This position presupposes the conviction that the linguistic and the conceptual structure are not of the same nature. Epistemic attitudes are psychological entities, in the sense that they pertain to the conceptual level, and they may or may not be brought to the level of consciousness or of linguistic expression. They are a fundamental category for the architecture of the human mind. Epistemic modality is viewed as the semantic category including the linguistic means for the expression of the speaker's epistemic attitude towards a state of affairs.

[5] For the sake of convenience, I will use the expression *epistemic evaluation* as a general label referring to both the psychological domain of epistemic attitudes and to the linguistic category of epistemic modality.

defined as the speaker's evaluation of the likelihood of a state of affairs. First of all, it is worth noting that, plausibly, it is not only a speaker who evaluates epistemically a state of affairs[6]: in the communicative situation the hearer as well epistemically assesses every chunk of information that he receives through the communication itself, as well as any information he can retrieve from the communicative setting and context.

Having epistemic attitudes towards a state of affairs means performing an epistemic evaluation, that is, positioning such a *hypothetical* state of affairs along a scale of likelihood. The "scale of likelihood" is connected to the gradual nature of attitudes. In his extensive paradigmatic study of epistemic modality, Nuyts (2001:21-22) writes:

"(...) epistemic modality concerns an estimation of the likelihood that (some aspects of) a certain state of affairs is/has been/will be true (or false) in the context of the possible world under consideration. And this estimation of likelihood is situated on a scale going from certainty that the state of affairs applies, via a neutral or agnostic stance towards its occurrence, to certainty that it does not apply, via intermediary positions on the positive and the negative sides of the scale."

Belief fixation, as a result of epistemic evaluation, is a fundamental process in human cognitive life. It is reasonable to hypothesize that every piece of information which is presented to our mind needs to be epistemically qualified.

Epistemic evaluations are defined by Nuyts (2001:23) as "a basic category of human conceptualization in general, emerging from high-level metarepresentational operations over knowledge". Evaluators compare their assumptions about a state of affairs to "whatever information about the world" they have available and which is considered to be relevant to the state of affairs.

Information can he gathered in different ways. As far as intuitive beliefs are concerned, there are at least two basic candidates, perception and communication, with a third one depending on the existence of already formed intuitive

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[6] "State of affairs" itself is a cover term for several entities. A state of affairs is traditionally defined as an abstract construct, a set of objects related to one another, which, in order to be linguistically expressed must take a propositional form, which is represented as p. In the case of epistemic evaluation we always deal with hypothetical states of affairs whose epistemic status is being assessed. However, the largely used label "state of affairs" is not only common in philosophy or logic: it is widely used also in linguistics, psychology, etc. and it covers entities of different nature.

beliefs: automatic inference[7].

When we perceive a sensory input, we need to transform it into a conceptual representation of that input, which must receive an epistemic value. Communication can play the same role as perception in belief fixation[8].

5.2. *Knowledge and belief*

This brings about another difficult and much-debated question concerning knowledge: the problem of what knowledge consists of. Among the many definitions that knowledge has received, one considers it as "true and justified belief".

Provisionally, we will conclude that epistemic evaluation seems to have as an output the assignment of a "likelihood degree" to a representation. When this degree is very high, that is, when the evaluator is certain that a representation of some sort holds, the output is a piece of knowledge, otherwise when the degree is still positive but below the level of certainty, the output is a belief.

This definition seems to bring us back to the distinction between intuitive and reflective beliefs. Intuitive beliefs stored in our "belief box" seem to form a large part of our steady knowledge, both in terms of encyclopaedic knowledge and of referent assignment. As we have already mentioned, Sperber (1997:68) defines them as "representations stored in the data-base (...) treated as a representation of an actual state of affairs, i.e. as a belief' (B(P)).

As Sperber (1997) claims, certain representations can be embedded in meta-representations, they are possibly stored in the database (p.69) "but they are insulated from other representations in the base by the meta-representational context in which they occur embedded. They are not automatically treaded as data".

What is very interesting is the representation proposed for these reflective beliefs, V(R), where R stands for the embedded representation which might be presented as true or false, (or as not known), and V stands for a "validating context". Sperber (1997:71) acknowledges a huge variety of possible validating

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[7] "Automatic" as opposed to an inference which is the result of analytical reasoning over evidence.

[8] In this sense, the perceptual and conversational inputs all belong to that class of entities which are usually defined "states of affairs". But more complex entities such as the propositional content of utterances in a conversational setting as well as all the implied information communicated must also be epistemically evaluated in order to form what Sperber defined "reflective beliefs", that is meta-representations. These entities are also "states of affairs" then.

contexts, such as reference to authority, to divine revelation, explicit argument or proof, etc.

Thus, following the traditional opposition between knowledge and belief, the epistemic scale can be envisaged as having one of its extremes in knowledge. An evaluating subject can therefore have two "extreme epistemological attitudes" towards the state of affairs: he can either "know that *p*" or he can "not know that *p*". Or, more precisely, he can either be "certain that *p*", or "uncertain that *p*" in always increasing degrees until he is "incapable of epistemically evaluating *p*". This can be roughly represented as
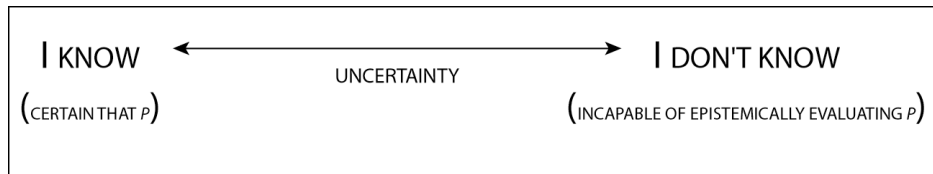
The epistemic scale, though, is not a linear one, but a complex category, in line with Bertuccelli Papi's definition of attitudes as being relational, having an object, intensity and a structure.

It involves an evaluator, who can be more or less certain[9] that *p, and* a state of affairs and therefore, it presumably develops along *two* independent lines: the (un)certainty of the evaluator and the likelihood of the state of affairs.

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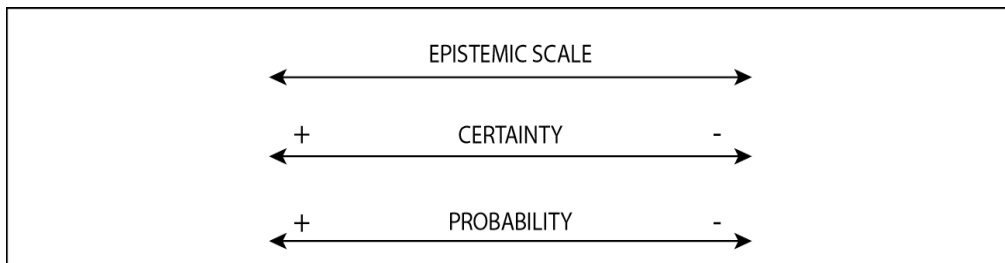
[9] It would probably be better to say that a speaker can be *more or less uncertain* rather than certain, since certainty is logically a matter of yes or no, rather than a scale. Even a slight hesitation moves the evaluation into the domain of uncertainty. Either an evaluator is certain or he is not, in which case he can even be *pretty certain:* his attitude still belongs in the uncertainty domain, although in the lowest degrees of it. The term certain and certainty are used here to conform to the general trend of using the "positive term" to indicate a scale, as in height and width.

An evaluator can be more or less (un)certain than a state of affairs holds or does not hold: these two dimensions are overlapping and interacting. Accordingly, I will define the epistemic evaluation as the evaluator's more or less certain assignment of a degree of likelihood to a state of affairs.

5.3. *The role of the validating context*

The validating context seems to have a crucial role to play in the epistemic evaluation. It is hypothesizable that an epistemic evaluation always follows from some kind of "premise" triggering the assignment of a certain position along the epistemic scale to a state of affairs. We can be aware of the reasons why we assign a certain epistemic value, that is of the "verification process" (cf. Bertuccelli Papi 1987), or not, but there must be a source for our epistemic evaluation, otherwise in principle, we can only say that "we do not know".

This verification process is an evaluative operation over the available evidence. The speaker's attitudes too, which the hearer must consider in order to retrieve the exact meaning which is being communicated, are entirely part of the validating context, and, therefore, they must undergo the verification process.

When the source for the evaluation is considered totally reliable, as often happens in the case of perception, the epistemic value assigned is "positive certainty", and we hold a representation as a piece of knowledge[10].

The source of the information, the validating context as well as the verification process are all questions which fall under the study of *evidentiality* and its role in cognition. Evidentiality is a controversial domain (Chafe and Nichols 1986), which is usually considered as being in strict connection with epistemic modality and, often, it is even treated as a sub-domain of the latter (Palmer 1986). As the considerations illustrated up to this point seem to show, these two domains are interrelated at a very deep level, and it appears that

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[10] This view is supported also by Du Bois (1986). He identifies four factors which the hearer might want to consider relative to the speaker: his evidence for what he says, his interests and how this might lead to a distortion of the information provided, his sincerity and his fallibility. If the speaker is regarded as trustworthy, the hearer can safely save on cognitive resources and rely on the speaker's evaluation of the information. On the other hand, if the speaker's reliability is not considered high, the hearer will want to evaluate the information himself and he will resort to evidential cues (Fitneva 2001).

that the issue of evidentiality will be brought into the discussion whenever epistemic modality is under analysis. A tempting solution might seem to be that pursued by Hengeveld (1988, 1989), who proposed the existence of a wider category of *epistemological modality*[11].

I will side with the voices supporting the independence of the semantic domain of evidentiality from the semantic domain of epistemicity (Nuyts 2001, DeLancey 1997).

While epistemic modality concerns the evaluation of the likelihood of a certain hypothetical state of affairs and its holding or not holding, I take evidentiality to deal with the speaker signalling or evaluating the nature of the evidence he has relative to a certain state of affairs, which I consider to be prior to the epistemic evaluation of the state of affairs.

I will conclude that either these two processes are carried out in parallel, in a complex interplay of the two dimensions, or, more plausibly, the evidential evaluation is prior to the epistemic one.

Traditionally, the category of evidentiality has been further specified according to the source of information it describes in several sub-categories such as inferentiality, hearsay, direct perception, etc. (Chafe and Nichols 1986).

Nuyts (2001) emphasized the major role which is played by evidential considerations in epistemic judgments and underlined the role of fundamental transversal categories such as subjectivity and intersubjectivity.

He argued that, if an epistemic evaluation is based on strong evidence (like perception, but also logical syllogistic inference), it will be felt as more objective than an evaluation based on weaker evidence such as personal judgment.

Moreover, attention is drawn to the joint role of the participants in the conversational intercourse as a fundamental part of the conversational context: a speaker can in fact hint at the fact that he alone has evidence for the provided information or for drawing a certain conclusion or alternatively, he can allude to the fact that the evidence he is providing is known or available to a larger group of people who can therefore share the conclusions based on it. The responsibility that the speaker assumes for the possible epistemic evaluation based on the evidence he provides in the two cases is different: full responsibility in the first case, shared responsibility in the second. This would also change the force of the epistemic evaluation, causing

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[11] This term would preserve the broader etymological meaning of epistemicity, that is the derivation from the Greek *epist_m_,* `knowledge".

it to be perceived as subjective or objective, or I should probably say more or less subjective.

The epistemic evaluation changes therefore according to the evaluation of the evidence on which it is based.

Thus, the difficulty in separating the two interwoven categories must derive from the fact that the two semantic dimensions tend to co-occur and to "evoke" each other because, *cognitively,* they work in strict contact. Our experience of the world tells us that if one holds that something is possible, one must have some sort of evidence justifying this sort of attitude. Conversely, if one has a certain type of evidence available, one tends to epistemically evaluate all the relative states of affairs accordingly.

Evidentiality seems to lack certain features which characterize attitudes like the epistemic one, such as polarity and distance from perceptual facts.

The notion of subjectivity can provide a possible explanation. Subjectivity is a cover term for many phenomena of very diverse nature. It can be the expression of the speaker's point of view, of a judgement, of his attitude, both cognitive and emotive, his involvement. The only point of contact among the many definitions found in the literature (see Stein 1995) is the *I* of the cogniser/evaluator.

I would like to use subjectivity in this sense, as the expression of an *ego* and its pervasiveness in the evaluation, be it performed or reported. In this sense, the verbs of cognitive attitude are means for the expression of subjectivity.

This dimension can be integrated into the evidential domain. If the speaker can signal the external source of information, it is hypothesizable that the opposite possibility is also available, as a sort of "internal evidence": the speaker could signal that he is uttering a personal judgement based on no other evidence but his own personal evaluation. I will define this sort of evidence as "affective evidence", and I will take it to include impressions, irrationality and any type of evidence depending on the *ego* of the evaluator.

It is also possible that, in case of epistemic evaluation, where the requirement for the evaluator to have some sort of evidence would be plausible, the choice of a particular linguistic expression rather than another, has the function of signalling a sort of "negative evidence" or "absent evidence", and this would reintroduce polarity.

We can schematically illustrate evidentiality as:
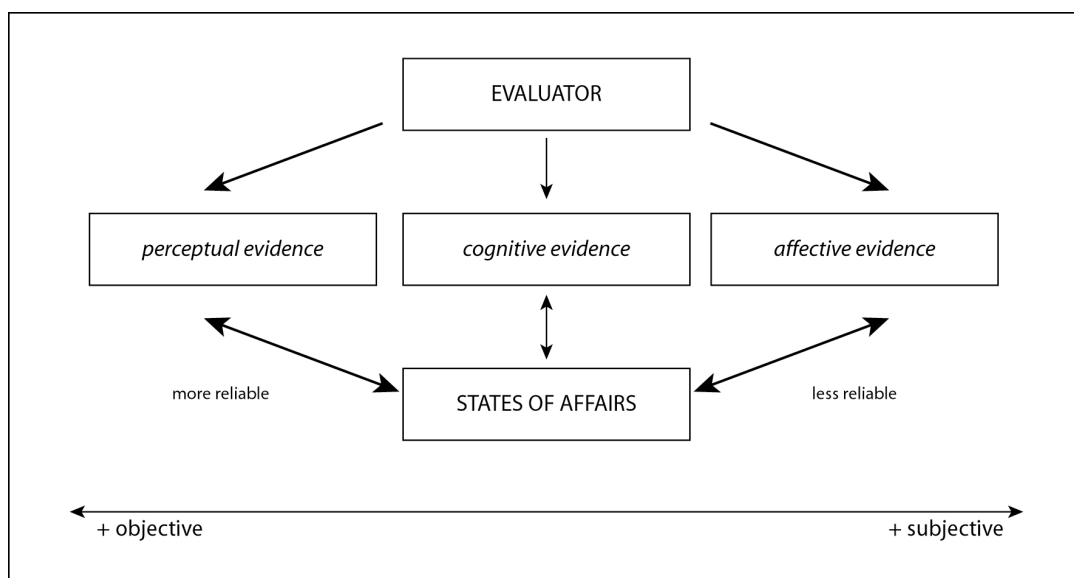
The notion of "subjectivity", meant as the pervasiveness of the *ego* of language users, is a transversal dimension, probably an indisputable background emanating from the self-consciousness of us all. Sometimes it is overtly expressed, while other times it is hidden behind competing dimensions. This is the sense of the "objectivity line" in the schema above. Different contextual circumstances, where context is interpreted in the broadest possible way, will plausibly give the impression that the state of affairs is more or less factive.

To sum up, I have been arguing that there is no such opposition as subjective vs. objective modality, but more or less reliable evidence, and epistemic evaluations collocating states of affairs higher or lower in the epistemic scale with certain degree of commitment on the part of the evaluator.

In what follows, I will try to show the way in which the English language lexicalizes the epistemological dimension via the class of cognitive attitude verbs, attempting to demonstrate how the cognitive attitude meaning is the result of a construal connected to particular "linguistic contextual constraints" (Croft & Cruse 2003), and that the analysis of certain combinatory patterns in which the single verbs occur helps determine the unique feature of the semantic potential of each verb, despite the apparent large areas of overlap in the meaning of some of these verbs.

6. *Verbs of Cognitive Attitude: the lexical codification of the evidential and epistemic dimension*

6.1. *A corpus-based study of verbs of cognitive attitude[12] in English*

The often-mentioned verb *believe* belongs to the class of verbs of cognitive attitude, verbs capable of expressing the "existential" qualification of states of affairs in terms of evidential and epistemic qualifications.

An extensive study of this class carried out as part of the project for a doctoral dissertation on the lexical semantic study of these verbs has revealed a remarkable consistency between 24 verbs, which have been identified as English "verbs of cognitive attitude". The selection was carried out on a larger list of 44 verbs first compiled on the basis of dictionary entries and synonymy relations with the verb *believe* according to various dictionaries *(Collins Cobuild, OED, Merriam-Webster),* to the *Roget's Thesaurus* and to *Wordnet,* and then restricted on the basis of several syntactic and semantic criteria, among which the judgement of native speakers of English, who were confronted with several batteries of tests.

The verbs identified as verbs of cognitive attitude are

assume	*expect*	*imagine*	*sense*
believe	*fancy*	*judge*	*suppose*
bet	*feel*	*know*	*surmise*
conjecture	*figure*	*presume*	*suspect*
consider	*gather*	*reckon*	*think*
doubt	*guess*	*see (I can't see...)*	*trust*
			wonder (I shouldn't w.)

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[12] The material for this section is provided by an extensive corpus study of 25 English verbs which was part of the project for a doctoral dissertation on the lexical semantics of English verbs of cognitive attitude.

The verb *know* was included only inasmuch as it represents one of the poles of the epistemological dimension, and *see* and *wonder* can be considered members of the class only when they occur in a particular syntactic structure. The analysis provided a general but hopefully reliable picture of the lexicalization of the evidential and epistemic domains via verbs of cognitive attitude.

6.2. *Factors favouring the construal of the propositional attitude meaning of verbs of cognitive attitude*

In order to study the linguistic semantics of these verbs, a total of 155.910 occurrences were collected from the British National Corpus, 10.503 (6,7%) of which are modified by adverbs or adverbial expressions. All of the modified occurrences were analysed in detail, along with 5425 (3.5%) other occurrences of these verbs in different grammatical persons, moods, tenses and voices. Over 15000 other occurrences of these verbs in the simple present tense were at least superficially scanned (9.6%), whereas the rest of the occurrences were randomly consulted when necessary.

The corpus study revealed that great importance is attributed in the construction of the propositional attitude meaning of the verbs included in the list of cognitive attitude verbs to what Croft and Cruse (2003) define as *contextual constraints*, which are further classified in several types summarized in the scheme below:

1. Linguistic context (» Clark's personal common ground)
   a. Previous discourse
   b. Immediate linguistic environment
   c. Type of discourse
2. Physical context (» Clark's perceptual basis for personal common ground)
3. Social Context
4. Stored knowledge (» Clark's communal common ground)

The linguistic context in which the verb occurs plays a fundamental role in determining the meaning construal: all of these verbs can in fact be construed in their cognitive attitude meaning or in their "mental state meaning" and in certain cases even in unrelated senses. The following sentences exemplify this point, with only 2 and 3 containing the expression of the cognitive attitude of the speaker:

1. I am thinking about next Sunday... it's certainly going to be a nightmare with all those guests for lunch!

2. I honestly think that Sunday will be a nightmare with all those guests for lunch!
3. I assume Sunday will be a nightmare with all those guests for lunch!
4. I assumed a horrified expression when I realised that there would be so many guests for lunch!
5. I assumed a professional cook to help me with the Sunday lunch.

Most of the time, there are strong connections between the attitude meaning and the other meanings of verbs of cognitive attitude. The most plausible hypothesis is that the attitude meaning developed from the "non-qualificational" one via the semantic reinterpretation of certain semantic dimensions present in the semantic potential of the verb[13].

Three elements seem to concur in the most significant way in the construal of the qualificational (i.e. attitude) meaning: the syntactic structure in which the verb occurs, the discourse type, and the immediate semantic context. The attitude and mental state senses of verbs of cognitive attitude tend to occur in different syntactic patterns. The attitude construal, as it could be expected, emerges when the verb is followed by a proposition with or without complementiser. In principle, mental state construals could also occur in this pattern, but, when the verb is used in this form, it is usually very hard to distinguish the correct interpretation which must be attributed to the verb. However, if the verb is in the progressive form, the only possible construal seems to be the non-qualificational (i.e. mental state) one. Consider for instance:

6. I think that John is very nice
7. I am thinking that John is very nice

(6) is most naturally interpreted as the expression of the evaluation of a state of affairs and (7) cannot but be interpreted as an act of cogitation[14].

These verbs seem to function as real expressions of the attitude of the subject only when the verb occurs in the 1st person singular and plural and, in some cases, in the 2nd person singular and plural in questions.

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[13] Such changes seem to follow paths of change which can be identified with the processes described in the language change literature, and in particular with Elizabeth Traugott's subjectification and intersubjectification processes.

[14] There are, however, some borderline cases such as "I was thinking that John is a nice person in the end", where the progressive form seems to be a means for the modalisation of the sentence, and the verb can be interpreted as expressing a qualification of a state of affairs.

The grammatical person is on the border between syntax and semantics, and so are tense and mood. Any tense except for the simple present tense seems to force "descriptive" construals: only in the "here and now" can an act of evaluation be "performed", otherwise it is described, and the commitment of the subject at the moment of speaking is no longer relevant.

The imperative mood seems, for instance, to discourage the construal of the attitude meaning. Let's consider the following sentences:

8. Let's assume that ...
9. ?Let's believe that...
10. ?Let's reckon that...

the verbs cannot but be interpreted as expressing a mental state, and except for (8) it is not even clear whether these sentences are acceptable. Certainly, there are no occurrences in the BNC, and the major internet search engine, Google, only lists one result for (10) in the whole world wide web. This is certainly a significant fact.

The attitude reading seems to be construed in few other syntactic patterns, such as "V + O + to-INF" as in

11. I believe him to be a nice person
12. I assume him to be a nice person
13. I imagine him to be a nice person

For other verbs occurring in such constructions it seems to be strange[15]:

14. ?I think him to be a nice person
15. ?I suppose him to be a nice person

Non-qualificational construals can occur in a number of different contexts, which vary from verb to verb.

Cognitive attitude construals for certain verbs, i.e. *doubt,* are also possible when the verb is followed by *"whether/if + p"*. This represents, however, the only case of such a very different syntactic pattern: the most common form is no doubt the verb followed by a complement clause.

The syntactic pattern is definitely a fundamental factor in determining the contextualised interpretation that the verb will receive, but at the same time

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[15] It is probably not by chance that the verbs which more easily allow this construal are verbs which could take a direct object. which probably makes this construction more acceptable.

the immediate lexical context also has a remarkable role to play.

Verbs of cognitive attitude tend to be more frequent in spoken English than in written English[16]. Propositional attitude construals seem to emerge in "antagonistic contexts", where there is a contrast, explicit or hypothetical, between the interlocutors' attitudes towards a certain state of affairs. This fact makes argumentative texts the ideal locus for verbs of cognitive attitude.

Contexts in which the speaker expresses personal opinions which derive from his individual experience or from his attitudes, also favour the attitude construal of these verbs. They tend to be very frequent when the speaker interprets and opposes his own and his interlocutor's attitudes[17]. This opposition is naturally not only explicitly stated in the immediate context: on occasion, it is retrievable at the macro-level of discourse or it is based on the attitude attribution by the speaker.

The argumentative nature of discourse seems to be a very important element in favouring the propositional attitude construal of verbs of cognitive attitude. Of course, they do not occur only in spoken English, where they encode the subjective and often tentative judgement of an evaluator, but in written English as well, even in very formal writing.

The last element[18] which favours the attitude construal is the close semantic context. Verbs of cognitive attitude tend to co-occur with harmonic lexical items, that is, with lexical items pertaining to the same semantic domains: epistemicity, subjectivity, evaluation, and naturally evidentiality[19].

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[16] Searching the BNC in order to retrieve the number of occurrences of these verbs in the Spoken English, Written English and Written-to-be-spoken English subcorpora, the number of occurrences in written texts is higher than the number of the occurrences in the spoken texts. However, it must be considered that in written texts they almost always occur in dialogic texts or in transcriptions of oral interactions.

[17] The fact that verbs of cognitive attitude may be accompanied by other expressions of subjectivity might correlate to these antagonistic contexts as well.

[18] The order in which I have presented the elements which favour the qualificational construals of verbs of cognitive attitude is not related to considerations of importance. The three factors are most probably equally relevant, although probably for different reasons.

[19] I would like to underline the fact that when talking about factors favouring a certain construal rather than another, I am necessarily assuming the hearer's perspective, who is faced with a certain text and with certain lexical items in context and who retrieves the correct meaning that the speaker wishes to convey, thanks to certain elements which force certain construals. This all naturally happens automatically. This is, however, one of two sides of the same coin. As hearers we recognize that in an argumentative context a speaker will use verbs of cognitive attitude to make his stance clear, and this fact cannot but be strictly connected to our role of producers who choose in other situations to encode their subjective evidential-epistemic stance with certain lexical means in such contexts. Thus, as hearers, we take into consideration the elements which determine the relevant universe of interpretation, and as producers we automatically select the right word to encode our attitudes in a particular situation: were the discursive and situational contexts of a different nature, we would probably not feel the need to express certain attitudes, nor to make clear where we stand. It is a complex interplay of factors and neither the speaker nor the hearer act independently from one another, in virtue of that mind reading faculty which seems to guide our linguistic interaction.

Unfortunately, even the most detailed of the available dictionaries does not provide this type of information, with few exceptions based on frequency or on the level of fixity of possible combinatory patterns.

6.3. *Adverbs co-occurring with verbs of cognitive attitude*

The corpus study of the over 16000 occurrences showed that these 25 verbs lexicalize the dimensions hypothesized in section 5 above, namely epistemicity (that is, the likelihood of the state of affairs and the commitment of the evaluator) and evidentiality (at least most types of evidentiality and in different ways) and, often, they refer to the cognitive processes involved in the evaluation. These dimensions are variously combined, and different degrees of the various dimensions as well as different evidential sources are combined in these lexemes.

The study of the adverbs co-occurring with the verbs included in the class of verbs of cognitive attitude supports the internal coherence of the class and, at the same time, it reflects the semantic dimensions relevant for this class.

Verbs of cognitive attitude occur with adverbs of different type, both sentence adverbs and adverbs taking the whole VP in their scope and commenting either on the evaluator or on the output of the evaluation. Section I of the Appendix provides a schematic account of the adverb types retrieved in co-occurrence with verbs of cognitive attitude.

In the BNC, the verbs included in the class of verbs of cognitive attitude are modified by a total of 314 adverbs, distributed among the 25 verbs. Not all of the adverbs modify these verbs in their propositional attitude construal: only 201 (64%) of the adverbs retrieved in preverbal position occur with the cognitive attitude meaning, and my study focused on these cases. I excluded temporal adverbs *(now, continually, then,* etc.) and most linking adverbs (I only considered inferential linking adverbs such as *so, then* etc.), amounting to

13.5% of the occurrences with propositional attitude construals of the verbs.

It must be noted, though, that verbs of cognitive attitude when used in their "qualificational" meaning, both as the expression and as the description of an attitude, tend to co-occur without modifiers, with the sole exception of intensifiers. The most common pattern is usually $I +$ $verb\_{pres}$ without modifications, especially when used as propositional attitude predicates. This tendency has been observed in several studies on grammaticalization focusing on the ongoing grammaticalization of "belief predicates" in the first person of the simple present tense, such as in Thompson and Mulac (1991).

Sentence adverbs pertaining to the epistemic and evidential domain very frequently co-occur with verbs of cognitive attitude, as could be expected in line with the hypothesis that the propositional attitude meaning of these verbs emerges in context marked by epistemic uncertainty. This datum is also in line with the hypothesis that verbs co-occur with harmonic modifiers, operating on semantic dimensions included in or referred to by the semantic potential of the verb.

The tables below summarizes the distribution of the adverb types co-occurring with verbs of cognitive attitude construed in their "performative qualificational meaning" (cf. Nuyts 2001[20]), that is, when they express the subject's propositional attitude:

Table 1

ADVERB TYPE	Speaker-Oriented								
	Epistemic	*Evidential*	*Correctness of the evaluation*	*Warrantability*	*Rationality*	*Skills*	*Difficulty*	*Expectedness*	*Unexpectedness*
PERCENTAGE	12%	6%	6%	7%	2%	1%	1%	6%	1%

Table 2

ADVERB TYPE	Subject-oriented			
	Agent-Oriented		Mental-attitude	
	Attitude	*Rationality*	*Rational*	*Emotional*
PERCENTAGE	11%	6%	6%	1%

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[20] *Performative* here is not used as in the classic speech act theory, but as in Nuyts 2001, where it is taken to indicate that an evaluation is "performed" at the time of speaking, and that therefore it involves the commitment of the evaluator/cogniser.

Table 3

ADVERB TYPE	Functional Adverbs			
	Focusing adverbs	*Measure/Degree adverbs*	*Clausal degree adverbs (incl. Intensifiers)*	*Quantificational adverbs*
PERCENTAGE	6%	9%	14%	5%

Table 4
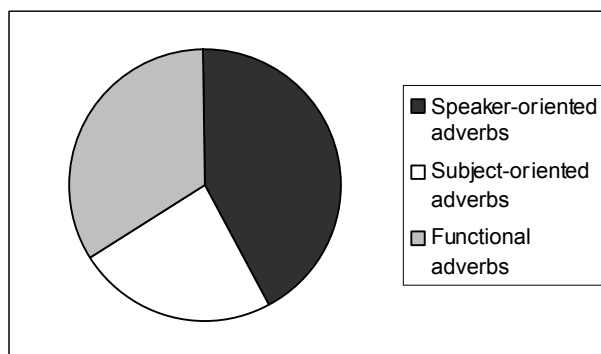
     The Appendix includes the list of the adverbs retrieved from the BNC for each verb.

7. Adverbial modification as a powerful "diagnostic tool"

7.1. Uniqueness of meaning and areas of overlap

In line with the observations put forth above, the analyses of the linguistic semantics of verbs of cognitive attitudes presupposed the existence of a pre-propositional semantic potential for each verb, differently specified in context according to several contextual and cotextual factors, so that a large range of cognitive attitudinal nuances can be expressed.

Despite the fact that each verb shows its uniqueness, there are nevertheless large areas of overlap, where different verbs are used as synonyms. Most definitions provided by dictionaries are based on such "synonymy effect" and the verbs are usually mutually defined resulting in a remarkable circularity. This is probably due to their inherent "epistemic vagueness", that is, to the fact that the level of likelihood or of certainty is often conditioned by contextual factors and it is not as defined as in other means for the expression of epistemicity

such as adverbs like *certainly* or *probably* which occupy a definite place in the epistemic scale. Verbs like *think* and *guess* can occupy a large range of positions, accordingly to the information provided in the context.

The contextual constraints and the lexical combinatory patterns in which these verbs can occur are valid "diagnostic tools" for the analysis of the distinguishing features of their meaning. A dictionary capable of including this information would doubtless be a very useful and powerful reference tool for all the "language users" aiming at a better understanding of the mechanisms of the target language.

I will exemplify this claim with a case study, namely the case of *guess, suppose* and *assume,* verbs which are often used as synonyms but which at a deeper analysis reveal significant differences.

7.2. A *case study:* suppose, guess and assume

Suppose, guess and *assume* have large overlapping areas in their meaning, and they generally appear in each other's dictionary entries.

Guess and *suppose* are largely considered to be stylistic variants or alternatives connected to the difference between British and North American English: the former would be more used in the United States and in Canada, whereas the latter would be more common in British English.

This is probably true in some cases, but both verbs exist in both varieties of English, and therefore they plausibly have unique features.

Let's consider the following examples:

16. Of sunshine, warmth and abundant fruit growing everywhere, and of love. I was born on 2 April 1960 in St Andrews in Kingston. There were two sisters ahead of me in the family, and though of course I did not know it, there was heady talk of emigration, possibly to Canada but more usually to England, the land of milk and honey and opportunity. I guess that plans were already being made when I was born, for a year or so later my Dad left for London. Two years after that, when he had saved enough money, my Mum went as well and I was left in the care of my grandmother, Anita Morrison. I stayed with her, in her house near the centre of Kingston, until I was seven years old.
Linford Christie: an autobiography. Christie, Linford and Ward, Tony, Arrow Books Ltd, London (1990).

17. And you are laughing again, shaking your head, it's what's-happening-I-don't-believe-this-honey time again. What amazes me, apart from the instant MGM jungle scenery that leaps out of the walls the minute you walk in, the way the carpet has become an over the rainbow poppy field, only it's rose petals, what amazes me is we don't run out of things to say. Well I guess we have a lot to catch up on, like the

whole of our lives seeing as we finally got to say hello to each other only years ago. I have this urge to snow you my childhood stamp collection, just that I don't have one. Time lilts by on the jazz schmaltz I adore, memories, blues and brandy. You start off being coy about drinking brandy.

Jay loves Lucy. Cooper, Fiona, Serpent's Tail, London (1991)

In these occurrences *guess* and *suppose* seem to be interchangeable.

The careful study of the corpus revealed that *suppose,* when used as a verb expressing the cognitive attitude of the evaluator, lexicalizes a relatively low committed epistemic evaluation that a certain state of affairs is the case, reached via an inferential process. The verb indicates a dynamic inferential process, usually presented as still ongoing and resulting in a provisional tentative conclusion.

This is why it is commonly found in the conclusion of monological texts where it introduces a tentative logical conclusion, a sort of "sudden revelation" which is not yet totally settled:

18. And now John Cleese has added more fuel to the debate. The Fawlty Towers star nailed his colours firmly to the mast when he married his third American wife this week in a secret ceremony in Barbados. `I find myself attracted to American ladies in a way I don't to English ladies. `Odd, isn't it?' says 52-year-old Cleese who met new wife Alyce-Faye Eichelberger two years ago. `During the three months I was in America a few years ago, it would happen again and again.' The character that Jamie Lee Curtis played in A Fish Called Wanda was wilful, determined, exciting, and manipulative. `I suppose that is what I find so fascinating about so many American women.'

Today. News Group Newspapers Ltd, London (1992-12).

Here the popular actor produces a long introduction about his "passion" for American women which presumably is iconic of his thoughts, and which leads him to a sort of "self-revelation", a logical conclusion introduced by *I suppose.*

On the other hand, *guess* seems to lexicalize a wider range of levels of commitment towards the likelihood of *p,* even though the most common meaning conveys very low commitment. The evaluation encoded by *guess* is also based on inferentiality, but the proofs are considered less reliable and the tentative conclusion to which the evaluator can arrive usually requires some imagination and not only rational computation.

19. You think, I thought you said she's booked, she hasn't booked. Oh no, she's definitely wants to go, but she hasn't actually filled out the form .Well, she's, she's going

to it .Erm, yeah I think she said she'd get one directly. Erm. I think er, I guess that any individual members would get them in their. erm journal. Yes. I might, I might, yes, we, I, well, I'll, looks like it .I'm an individual member, perhaps I've done, got round to opening the.

Amnesty International meeting

We can safely prove that *guess* and *suppose* are not complete synonyms, and the lexical combinatory patterns in which they enter can help us in this task.

The fact that *guess* in certain occurrences like the ones presented above seems to be totally interchangeable with *suppose* depends on contextual factors. Both in 16 and 17, evidential information is provided in the context, reinforcing therefore, the output of the evaluation, which seems to be based on more logical, reliable evaluated premises. Thus, the occurrences of *guess* are followed by supporting evidence for the inferential process:

[...] for a year or so later my Dad left for London (16)
[...] seeing as we finally got to say hello to each other only years ago (17)

This is the case in the majority of the other occurrences retrieved, 'in which *guess* seems to be a stylistic variant for *suppose:* either the supporting evidence is provided in the same sentence or shortly thereafter. In some other cases other contextual elements bring the meaning of *guess* to coincide with that of *suppose.* Let's consider the following case:

20. Whiplash. `Callahan liked the sound of the word whiplash. It could have kept him going for hours. 1 told him I'd been talking to Richie .He thought Richie was a great surfer but a poor human being. `He's inhaled too much resin - sends you crazy after a while.' He paused. `I guess that's what makes surfing so interesting. You have all these weirdos.'
   Walking on Water. Martin, Andy, John Murray (Publishers) Ltd, London (1991)

The reference to a pause is pragmatically associated with an act of thinking, and the immediately following occurrence of *guess* is interpreted as expressing the output of such a computational process. Moreover, as in the other cases, supporting evidence follows it:

[...] You have all these weirdos.

Similar overlaps seem to arise between *suppose* and *assume.* Let's consider the following occurrence of *assume:*

21. "Harvey Markovitch, are you a political appointee as a Governor?" "No, I'm not, I'm a co-opted member of the Governing body. I assume that that's because I'm a Consultant Paediatrician in Banbury".
Bill Heine radio phone-in.

Trying to substitute *suppose* for *assume* in the same context, the sentence assumes a much more subjective and tentative "sound".

The corpus study of *assume* revealed that it shares with *suppose* and *guess* the evidential inferential dimension. However, the inferentiality lexicalized by *assume* seems to be based on different proofs, such as clichés, commonplace beliefs and general knowledge. Moreover, the distinguishing feature of this verb seems to be the fact that it lexicalizes a sort of negative evidentiality, namely the fact that the verification process is not carried out. Nevertheless, the evaluator is presented as committed to the high probability that the state of affairs evaluated is actually the case. This complex "semantic potential" allows language users to choose this verb whenever they want to introduce information which must be considered as a given, as a premise for the reasoning which will presumably follow, even though such information is not supported by certain evidence. *Assume* can thus play the information strategic role of "backgrounding device for disagreeable information":

22. But politicians generally have very suspicious minds and when things are kept hidden from them they tend to want to know why. They tend to ask questions in t in an attempt to find out what is going on. Leaving the visits to Brussels aside, for I assume that these were entirely legitimate, what do we find when we start to unravel the mysterious secrecy surrounding the civic junkets to far off lands? We find three trips, all of a rather dubious nature, to attend what are officially described as Conferences on European co-operation.
Bradford Metropolitan Council: debate.

The differences between these verbs emerge clearly even with trivial tests, such as the substitution of one verb for the other in the same contexts. Several of these tests were presented to native speakers and their judgements, indicating that the meaning conveyed (almost always identified in terms of commitment of the evaluator) showed a total consistency[21].

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[21] The tests mentioned above were proposed to 8 native speakers of English of different age and gender and from different English speaking areas. The informants were 4 women (22, 28, 58 and 60 years old) and 4 men (20, 31, 65 and 55). Three informants were native speakers of British English, two of Canadian English, two of American English and one of Australian English. The differences in age, gender and variety of English did not produce significant differences in the results. The only comment to remark is that the British English speaking informant of 65 (male) observed that he felt *guess* to be very informal in certain cases. For the younger informants it was totally acceptable.

7.3. *Lexical combinatory patterns as powerful tools for the lexical semantic analysis*

Very useful information is provided by the syntactic and lexical combinatory patterns in which verbs of cognitive attitude can or cannot occur.

The relationship between syntax and semantics is not simple. Is the propositional attitude meaning construed only when the verb occurs in a certain syntactic pattern or is a syntactic pattern allowed only when the verb has a certain meaning? This is a very complex question, which would require much more space than allowed by this article. I am prone to hypothesize that it is a combination of the two. In the process of language acquisition children probably associate meaning and structures, which later on become more fixed in line with the linguistic conventions in which they happen to grow up (Tomasello 2003). I will leave this problem aside and turn to the illustration of the important role that lexical combinatory patterns can have in a dynamic account of lexical meaning, such as the one proposed in this article, where meaning is construed in the actual context of use[22].

Let's consider imperative contexts. Whereas it is possible for *suppose* and *assume* to occur in such contexts, *guess* does not allow for this possibility. Thus,

Let's suppose that he arrived two hours later than we thought.
Let's assume that he arrived two hours later than we thought.
* Let's guess that he arrived two hours later than we thought.

Suppose   she   was   scared   of   him.
Assume   she   was   scared   of   him.
* Guess she was scared of him.

Suppose and *assume* allow, in virtue of their "fictional world creating nature",

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[22] The brief summary of the differences in meaning between the verbs briefly mentioned above is actually the result of a detailed study of the corpus data and of the results of tests like the ones described above. The impossibility to occur in certain syntactic patterns or to co-occur with certain adverbs and other lexical items was taken to be a proof of the presence (or absence) of certain semantic dimensions in the semantic potential of the verbs.

the occurrences in this syntactic pattern, whereas guessing, for its tentative *conclusive* nature cannot be imposed, as is the case with *believe*. The meaning of the verb makes it impossible to use it in imperative constructions when it lexicalizes cognitive attitudes, while the sentence

Guess what I found?

is perfectly fine when *guess* means "try to figure out".

Hypothetically, this "focus on the most likely conclusion" encoded by *guess* should disallow the intersubjective construction in the passive which requires steadiness of the conclusion. And in fact we find that whereas

"The Passion" is supposed to be a good film.
"The Passion" is assumed to be a good film

are fine,

??"The Passion" is guessed to be a good film.

is scarcely (if even) acceptable.

An analysis of the semantic components involved in a verb can provide us with some sort of predictive power (however modest) over the possibilities for a verb to occur in certain semantic patterns. The same is ideally true of the lexical combinatory patterns in which these verbs can collocate. These latter as well will be subject to the semantics of the lexical items at issue, which hypothetically allow certain combinations and not others. The possible combinations will not be all of the same nature, but will most plausibly be felt as more or less natural (or marked) until they will be felt as unacceptable.

As far as the lexical combinability is concerned, a useful insight into the meaning of these verbs can be provided by adverbial modification[23]. The initial

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[23] As I mentioned above, adverbs tend to occur with descriptive uses of verbs of cognitive attitude rather than with verbs occurring in the 1st person singular. This is connected to the fact that, with the exception of the intensifying adverbs, evaluators do not usually comment on the output of their evaluation or on their commitment. They tend to lexicalize their attitudes in the simplest possible way, with the verb in the form 1 + V. This might also be connected to the process of epistemicization envisaged by Thompson and Mulac (1991) who see in the limited compositionality of epistemic expressions in this format the sign of a progressive grammaticalization.

assumption is that when these verbs are modified by adverbs, these latter will take in their scope only a "portion" of the meaning of the verb: in principle, adverbs co-occurring with these verbs should tell us something about their internal semantics, as they should select certain semantic components as their "purchase". When they do not modify the verb itself, they should however be harmonic with the dimensions identified in their semantic potential and contribute to the modulation of such dimensions.

Indeed, two combinatory possibilities with adverbs provide relevant information about the internal semantics of these verbs: the immediate adverbial collocation, and the combinability with adverbs in the complement clause[24].

In principle, only the lexicalization of one higher-level qualification of the same kind is possible in the sentence. Thus, in spite of the fact that it is possible to say "I think that John might be in town", "?I think that probably John is in town" although largely accepted, is considered to be too colloquial to be used in more formal texts and it is even judged redundant by some native speakers, since epistemicity is already encoded by *think*. This form is acceptable for some native speakers because the evaluation expressed by the verb and the adverb is equivalent. "*I think that John is certainly in town" is not accepted.

The same happens with these verbs:

I suppose/assume/guess that John might be in town

?I suppose/assume/guess that John is probably in town
??I suppose/assume/guess that John is possibly in town
*I suppose/assume/guess that John is certainly in town

I suppose/assume/guess that John must be in town

*I suppose/assume/guess that John is evidently in town
*I suppose/assume/guess that John is obviously in town

As could be expected the "supplementary" epistemic and evidential qualification of the complement clause is allowed only via modal verbs: these dimensions cannot be expressed through other lexical means, not even words expressing the same degrees of reliability or epistemicity. It is possible that

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[24] Because of the relatively low number of occurrences of similar cases, these considerations are significantly based on the results of the acceptability tests proposed to the 8 native speakers. The same holds for the data relative to the acceptability of certain adverbial modifications of these verbs which will be presented in the next paragraphs

probably and *possible* are felt as slightly acceptable because the crucial epistemic dimensions lexicalized by verbs of cognitive attitude is the commitment of the evaluator towards the vague positive degree of likelihood that *p* is the case. *Certainly* is, in fact, unacceptable.

This is not valid when the adverb co-occurs with these verbs in the same clause (i.e. in pre-verbal position), since in that case it takes the entire sentence in its scope and does not modify either the internal semantics of the verb itself or the proposition embedded under it.

In the course of the study mentioned above, many occurrences were retrieved with adverbs immediately preceding the verb. Most of these combinatory patterns were actually free, although the adverbs retrieved with the verbs confirmed the dimensions individuated in their semantic potential.

Sentence adverbs like the epistemic *certainly, probably, maybe, obviously,* etc. do not tell us much about the semantics of these lexical items, since they comment on the whole sentence[25]. However other adverbs do, and some of them provide interesting information as far as the distinction between apparently overlapping verbs are concerned, and provide, moreover, a significant insight into the domains related to the usage of these verbs.

The analysis of a large number of occurrences of the three verbs in context leads to the hypothesis relative to the semantic dimensions included in their semantic potential. Certain semantic dimensions were more prominent in one verb rather than another, or, in certain cases, they seemed to be present in one verb and absent in the others. The hypotheses relative to the semantics of each verb have been "tested" with the co-occurrences with adverbs, which help prove or disprove the hypotheses. As I mentioned, certain adverbs, such as the epistemic sentence adverbs, are common to the whole class. Other less frequent adverbs, though, seem to be acceptable only with certain verbs.

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[25] I will not focus on these adverbs here. A detailed list of the adverbs co-occurring with *suppose, guess* and *assume* is provided in the Appendix. The fact that I choose not to comment these adverbial modifications here does not mean that they do not tell us anything relevant about the linguistic semantics of these verbs. They, in fact, play a very important role, since the consistency of their co-occurrence with all the verbs included in the class of cognitive attitude verbs provides an argument in favour of the compactness of the class itself and naturally confirms the relevance of the epistemological dimensions for the semantic potential of these verbs. However, since the aim of this paper is to show that certain verb-adverb co-occurrences help determine the semantic "uniqueness" of a verb, therefore providing fundamental combinatorial information. I choose not to deal with sentence adverbs and with "more generally epistemological" adverbs common to all the verbs at issue.

The observations on the collocational possibilities which I present below, derive from the observation in the different adverb-verb collocations retrieved from the BNC for *suppose, guess* and *assume,* supplemented by acceptability tests performed by the native-speakers. Such acceptability tests were built in order to complement the data derived from the corpus. Often certain adverbs were retrieved in co-occurrence with one verb but not with the others: in these cases, acceptability tests for all of the three verbs were created in order to find out whether certain combinations were absent "by accident" or because they were disfavoured or even not acceptable.

The tests were presented in two formats. First, the native-speakers were presented with several series of three sentences, one for each combination adverb-verb, and then, after some time, they were presented with only one of the three occurrence introduced in a larger context (usually the combinatory pattern chosen was the one which was not present in the corpus in order to verify the higher or lower acceptability of the co-occurrence).

7.4. *Semantic dimensions identified in the corpus data and "preferred" adverb-verb combinatory patterns*

In line with the considerations illustrated up to this point, let's see how the dimensions involved in the semantic potential of these verbs are reflected in the co-occurrence with adverbs, or rather, how adverbs can confirm and/or reveal more or less subtle differences between the verbs.

Both *suppose* and *assume,* in virtue of their possibility to be constructed as lexicalizing **intersubjectivity**, collocate with adverbs like

commonly: it is commonly supposed/assumed that ...
generally: it is generally supposed/assumed that ...
normally: it is normally supposed/assumed that...
popularly, proverbially, traditionally, widely, etc.

This casts some light also on the higher commitment that these verbs lexicalize. If the fact that many people suppose/assume that *p* is the case is considered to provide more reliable support for an evaluation, it means that the commitment lexicalized by *suppose* and *assume* is at least enough to be taken into consideration. On the contrary, *guess* seems to lexicalize very low commitment. Generalized uncertainty does not provide any reliable basis, and this pragmatic factor probably does impinge upon the possibility for this verb to occur in these patterns.

This difference in the level of **commitment** encoded by the three verbs is

also involved in the divergences in the collocability with adverbs such as:

seriously: I seriously suppose/assume that...; do you seriously suppose/assume that...?
??I seriously guess that... ; *do you seriously guess that...?

The **inferential nature** of these verbs is also revealed by the collocation with certain adverbs, which, inter alia, seem to provide a discriminating tool to distinguish *guess* from *suppose* and *assume.* Thus,

> *easily:* you can easily suppose/assume that ...
>
> *realistically:* they realistically supposed/assumed that...
> *consistently:* they consistently supposed/assumed that...
> *coherently:* he coherently supposes/assumes that...
> *reasonably:* he reasonably supposes/assumes that...

are fine, whereas

> *easily:* *you can easily guess that ...
>
> *realistically:* *they realistically guessed that...
> *consistently:* *they consistently guessed that...
> *coherently:* *he coherently guesses that...
> *reasonably:* ?he reasonably guesses that...

are not acceptable in the cognitive attitude construal or not universally accepted. This must depend on the fact that guessing involves much more "imaginative work" and less logical inferentiality, and this justifies the combinability with a term like *imagination* in a sentence like "you don't need much imagination to guess that Paul is a very honest person", which is not acceptable in the case of *suppose* and *assume* (*"you don't need much imagination to suppose/assume that Paul is a very honest person").

The semantic-pragmatic perspective adopted in this analysis allows us to put forward another hypothesis: the logical inference lexicalized in *suppose* and the high level of likelihood assigned by *assume* should contrast with the much more tentative and uncertain evaluation lexicalized by *guess.*

The lexical combinability with adverbs commenting on the correctness of the **output of the evaluation** provides support for this hypothesis. Thus,

> *correctly:* he correctly supposed/assumed that...
>
> *mistakenly:* he mistakenly supposes/assumes that...
>
> *rightly, falsely, incorrectly,* etc..

are acceptable, whereas their co-occurrence with *guess* is not acceptable.

A note on frequency: the adverbs commenting on the mistaken nature of the evaluation occur much more frequently and in a much larger proportion (75%) than their positive counterpart (25%) with *assume,* as we could expect from the fact that the evaluation is not supported by the verification process. This seems to provide also an explanation for the common sceptical meaning conveyed by this verb in attributive contexts, which *suppose* does not convey. This "lack of rigor" in the verification of the available evidence is witnessed also by the possibility for *assume* to co-occur with adverbs signalling the irrationality of the evaluation:

foolishly: I foolishly assumed that...
subconsciously: I subconsciously assumed that...
unconsciously: I unconsciously assumed that...
lightly, simplistically, etc.

that cannot combine with *suppose* or *guess,* which evidently require "computation" of some sort. At the same time though, the high commitment of the evaluator without attention to evidence is captured by the possibility for *assume* to collocate with

confidently: I confidently assumed that...

which is not acceptable in the case of the other two verbs.

The list of all the adverbs retrieved in preverbal position with the single verbs is presented in the Appendix.

7. Concluding remarks

As it is evident, lexical combinatorial patterns, besides contributing to reveal important aspects of the lexical semantics of words and of their relationship to the conceptual dimensions lexicalized, can help determine in which contexts certain meanings are construed and in which they are blocked.

Moreover, the case of a fairly coherent class of verbs, such as that of the verbs of cognitive attitude, characterized by large areas of overlap between the members of the class, given the sometimes very subtle differences in their meaning, seems to provide a good example of the useful role which combinatory patterns can play in determining the unique features of each verb.

Starting from an initial "operational" hypothesis relative to the cognitive and semantic nature of the epistemological dimension, a list of 25 verbs was compiled and a large corpus of occurrences of these verbs was analysed in order

to determine the way in which the English language "linguistically carves out" this fundamental semantic domain, combining and lexicalizing semantic dimensions in the various predicates. The hypotheses relative to the dimensions involved in the semantic potential of each verb were then "tested", analysing the co-occurrences of each verb with adverbs, on the premise that the adverbial modification should reflect these semantic dimensions present in the semantic potential of the lexical item and that, therefore, verbs should co-occur with harmonic adverbs.

The adverb-verb combinatory patterns showed a remarkable consistency between the members of the class, while, at the same time, proved to be a very good means for uncovering the subtle differences in meaning between verbs showing large areas of overlap.

A good example is provided by the case of the verbs *suppose, guess* and *assume,* which are often treated as synonyms differing only in the level of formality and in the variety of English to which they belong.

The study of the data retrieved from the BNC was complemented by tests proposed to native speakers in order to determine the acceptability of the combinations of adverb-verbs which are not present in the corpus.

The results of the tests, besides showing an almost total agreement among informants, confirm the hypothesis relative to the differences in meaning between the three verbs, also showing that, even when they seem to be true synonyms, these verbs are actually used to convey very subtle nuances of meaning, and that therefore, the "synonymy effect" is most likely produced by contextual factors.

Existing combinatorial dictionaries, such as the *"'The BBI Combinatory Dictionar^y of English",* although providing much useful information, do not consider collocations of this type, since they are not organized according to cognitive-pragmatic considerations of the sort inspiring this kind of analysis. *Wordnet* (a lexical reference system based on psycholinguistic theories of human lexical memory), on the other hand, is the resource that comes closest to this "ideal", although not providing this type of information.

Observations like those proposed above relative to the combinatory patterns in which verbs belonging to a certain class can enter could be usefully exploited in hyper-textual or multidimensional format, which would provide a better idea of the complex conceptual, semantic and pragmatic relations underlying the linguistic behaviour of lexical items.

The exploration of the lexical combinatory patterns can provide a remarkable predictory power for the automatic treatment of texts, as well as for the development of reference tools for language teaching and "human translation".

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Appendix

Adverbs co-occurring with verbs of cognitive attitude

Note:
(1)   verbs of cognitive attitude construed as the expression of attitudes are not often modified. Adverbs occur more often with different forms of the verb or with qualificational descriptive uses (cf. Nuyts 2001 for the definition of *performative* and *descriptive qualificational* meanings). This is connected both with the progressive fixation of the pattern I + *V_pres* and with the fact that speakers normally tend not to comment on their own attitudes, but rather on other people's attitudes. The list of adverbs provided below includes all the adverbs retrieved with any verb form and every meaning construal of the verb.

(2)   Some adverbs appear in several columns of the tables, because they can have different functions and their meaning is sometimes defined in context. Thus, an inherently epistemic adverb such as *really* is more often found as an intensifier. The classification has no doubt many limitations and defects, since the object of my study was not the (very problematic) analysis of adverbial semantics. It was, though, a function of my research on the lexical semantics of verbs of cognitive attitude and it was meant to provide a useful systematisation of the large number of adverbs retrieved in front of these verbs. It does not aim to be considered in any way a definitive and exhaustive solution to the many problems connected to the classification of adverbs.

(3)   Some adverbs were not considered in the analysis and will not appear in the tables, such as temporal adverbs.

The adverbs are divided as follows:
Subject-oriented adverbs: these adverbs comment on the subject (i.e. on the *evaluator)*
            Agent-oriented: these adverbs comment on some quality of
                        the subject in performing the evaluation
            Mental Attitude: these adverbs comment on the mental states
                        of the evaluator, on such dimensions as con-
                        sciousness, firmness, confidence, satisfaction,
                        etc.
Speaker-oriented: these adverbs represent comment by the speaker on the state of affairs or on the (output of the) evaluation

Epistemic adverbs

Evidential adverbs
Viewpoint adverbs

Adverbs commenting on skills
Adverbs commenting on the correctness of the evaluation
Adverbs commenting on warrantability
Adverbs commenting on rationality of the evaluation
Adverbs commenting on difficulty of the evaluation
Adverbs commenting on the expectedness or the reverse of the evaluation
Pure manner adverbs

Functional adverbs: adverbs which play a functional role

Focusing /clausal degree adverbs (focusing adverbs, intensifiers, degree adverbs, etc.)

Quantificational adverbs: (frequency adverbs, diffusion adverbs, etc.)

Domain adverbs: adverbs explicating the domain within which the evaluation is valid.

Pure domain
Means domain

Linking adverbs: adverbs showing the connections of the evaluation to the rest of the discourse (Greenbaum 1969).