Antonymy and verbs of cognitive attitude: When *know* is the opposite of *think* and *believe*

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1. Introduction

This paper discusses the results of a micro-study on the possibility for the verbs *know*, *think* and *believe* to be explicitly opposed in the syntactic pattern "I don't think/believe so, I know so" and to be considered as antonyms. Despite the fact that hypothetically, in such a context, other verbs of cognitive attitude (e.g. *suppose*) might fill the slot occupied by *think* and *believe*, as a matter of fact, none seems to occur in this type of opposition. This opens the path for a number of interesting questions relative to the special status of the relationship between *know*, *think* and *believe* within the wider class of English verbs of cognitive attitude (Cappelli 2007b). In what follows, this preference observed in both naturally occurring and elicited data is discussed and explained through suggestions provided by dynamic approaches to meaning construal underlying both the theory of Lexical Complexity (Bertuccelli Papi and Lenci 2007) and the principle of Relation by Contrast – Lexical Contrast (Murphy 2003).

2. Verbs of cognitive attitude and lexical complexity

2.1. Lexical Complexity

Know, *think* and *believe* are representatives of a set of verbs that, in the literature, have been referred to as verbs of belief, propositional attitude predicates, etc. and that will here

be called verbs of cognitive attitude (Cappelli 2007b). Such a "label" seems to capture better the different facets of meaning expressed by these lexical items and the complexity of their meaning representations. Following Bertuccelli Papi's (1998) classification of attitudes, these verbs are viewed as potentially capable of expressing several cognitive attitudes of the main-clause subject (i.e., either the speaker or the grammatical subject in the case of attributive usage) with respect to the "existential status" of the state of affairs described by the embedded proposition. The term *existential* indicates both the degree of likelihood assigned to the state of affairs by the cognizer and the evidential considerations on which such an evaluation is founded.

The semantic and pragmatic features of this set of verbs can be best appreciated within the framework of Lexical Complexity as elaborated by Bertuccelli Papi (2003), Bertuccelli Papi and Lenci (2007), and Cappelli and Bertuccelli Papi (forthcoming). The model, which is strongly inspired by theories of complex dynamical systems and by Merlini Barbaresi's (2003) notion of "complexity", aims to provide a general framework for the evaluation of informational complexity and to identify the micro and macroprocesses that regulate lexical meaning construal in the actual context of use.

Complex dynamical systems can be defined as sets of integrated and interrelated dimensions or aspects of the world that change and evolve through time. They can be described in terms of the number and types of their dimensions and the forms and predictability of their organization. Complexity and organization act as competing forces: a system is more complex if it is composed of a greater number of dimensions interacting with one another. On the other hand, organization imposes structure, constraints and regularity to different extents, so that the system dynamics becomes more (easily) predictable and, consequently, the system's complexity is lowered.

The framework put forward by Bertuccelli Papi and Lenci (2007) is founded on the hypothesis that both language and the lexicon can be compared with other complex dynamical systems present in nature. With the latter, language and the lexicon share fundamental properties: dynamicity, non-linearity, nestedness and adaptability, self-organization and stochasticity. Cappelli and Bertuccelli Papi (forthcoming) outline the notion of lexical complexity starting from the assumption that languages are complex systems within which different types of structures act as organizers. This "organization" makes it possible for cognition to handle the immense amount of information involved in the communicative process.

Specifically, lexical complexity is seen as essentially dependent on two main parameters that act as opposite pulling forces: the type and quantity of information required to describe the system, and the system's organizational properties. In this view,

polysemy and context sensitiveness are taken to be inherent qualities of lexemes[1] and the disambiguation of senses and meaning construal are seen as the result of the stabilization of the system at a time t_1.

It follows from the principle of nestedness that complexity can be referred to the whole lexicon as a macrosystem, to semantic classes or semantic areas, and to individual lexemes as embedded micro-systems. Understood as complex dynamical micro-systems, words are viewed in this framework as "pointers to conceptual structures (semantic spaces) out of which meanings are dynamically construed in context-sensitive modalities, following a nonlinear process, but emerging in recurrent configurations with some degree of statistically relevant stability" (Bertuccelli Papi and Lenci 2007: 21). The meaning of lexical items is thus seen as variable combinations of portions of conceptual information, encyclopedic in nature, dynamically recruited and, "when no routine is available, resulting in different organization patterns with different associative links both from individual to individual and […] from language to language" (Bertuccelli Papi and Lenci 2007: 26).

2.2. Verbs of cognitive attitude as complex dynamical microsystems

In light of this theoretical background, the class of verbs of cognitive attitude can therefore be described as a complex dynamical system with nested complex dynamical microsystems (i.e., individual verbs). In Cappelli (2007b), 25 verbs were selected to be included in this class: *assume*, *believe*, *bet* (mostly American English), *conjecture*, *consider*, *doubt*, *expect*, *fancy*, *feel*, *figure*, *gather*, *guess*, *imagine*, *judge*, *know*, *presume*, *reckon*, *see* (as in *I can't see that…* – mostly British English), *sense*, *suppose*, *surmise*, *suspect*, *think*, *trust*, *wonder* (as in *I shouldn't wonder* – mostly British English). It is possible that other verbs that function as verbs of cognitive attitude in particular contexts can be added to this list: the category boundaries are certainly fuzzy with members that are more prototypical (e.g., *think*, *believe*) and others that are more marginal (e.g., *wonder*, *see*, *conjecture*). The verbs listed above fit in the category or the reverse according to the construal in which they enter every time, since the meaning potential of most of them covers other areas besides the "belief" sense.

As I have demonstrated elsewhere (Cappelli 2007b), the conceptual dimensions relevant for the complex dynamical systems at issue are *epistemicity* and *evidentiality* and their rich and varied interplay. They do represent a small number of dimensions, but they are varied, abstract and gradable (at least as far as epistemicity is concerned). Most important, epistemicity and evidentiality are strictly interwoven at both the conceptual level and at the level of linguistic usage.

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1   In line with Croft and Cruse (2004), the context acts as a constraint that dynamically selects the "portions" to enter into the construal of a certain "contextualized interpretation".

Verbs of cognitive attitude can be seen as pointing toward different positions along an epistemic axis. This axis ideally lies between two extreme poles, that is, *I know* and *I don't know* (Fig. 1), which represent, respectively, knowledge that something is the case and the impossibility of assessing the epistemic status of a state of affairs (Lehrer 1974; Cappelli 2007b). Unlike other treatments of the notion, however, I conceive of epistemic evaluation not as a simple linear dimension but rather as the outcome of the interaction of two scales, one centered upon the state of affairs and the other centered upon the subject of the evaluation: the former is the scale which assigns degrees of *likelihood* to a state of affairs, the latter expresses degrees of *certainty* of the evaluator in assigning such a status (Cappelli 2007b; Bertuccelli Papi 2000).

The position occupied along the "epistemic axes", represented in Fig. 2, depends on (among other things) the evidence that the evaluating subject has to support his or her assessment. Verbs of cognitive attitudes can encode reference to different forms of evidence, ranging from perceptual evidence (e.g., sight, hearsay), to cognitive evidence (e.g., inferentiality), to affective evidence (e.g., impressions, faith). Different evidential information forces interpretation of the epistemic evaluation as more or less subjective and hence more or less reliable (Cappelli 2005, 2007a, 2007b). This is represented in Fig. 3.
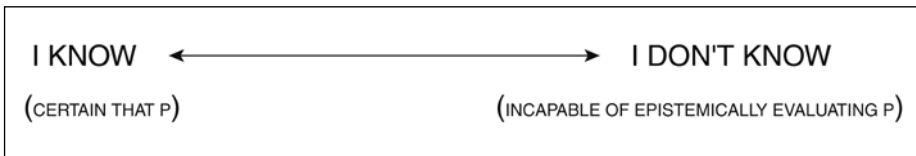
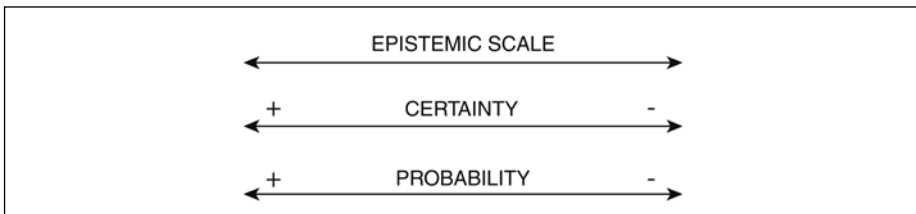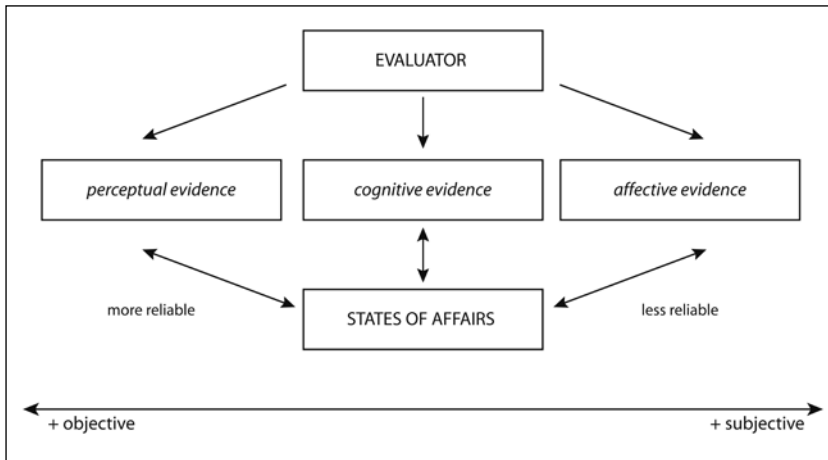

Fig. 1 – The epistemic scale

Fig. 2 – The two dimensions of epistemicity

Fig. 3 – Evidentiality

The "position" along these axes is neither fixed nor "punctual" and discrete. These verbs can in fact encode ranges of values that vary according to contextual semantic and pragmatic constraints. These constraints act as organizing forces that contribute to the structure of the microsystem represented by each individual lexical item.

The dimensions underlying the epistemic evaluation expressed by these verbs can be seen as two quite abstract conceptual domains operating at a higher cognitive level (Nuyts 2001) which are responsible for the complexity of the semantic space occupied by verbs of cognitive attitude. This complexity is inherited at the level of the individual lexicalizations of the conceptual domains. The various degrees of a relatively limited number of dimensions are in fact lexicalized by a relatively high number of lexical items displaying only subtle differences in meaning. Therefore, at the level of the "semantic area", we observe a complex system within which certain areas present a competing internal organization, resulting from the large number of lexical items sharing few dimensions and having as their only distinctive feature different rankings on the scales of the dimensions lexicalized.

The high density of the semantic area and the subtle differences among the semantic dimensions lexicalized make each of these microsystems a complex system endowed with a high level of adaptivity to the external pressures of contextual variables. These variables can change the strength of the epistemic evaluation, weaken or strengthen the evidence or the reliability of the evaluator in the receiver's eyes, and "push" a verb into the semantic space of another verb of the class, thus creating overlaps in the semantic area.

3. *I don't think so, I know so!* Data and open questions

The use of *think* and *know* as opposites in the negated frame *I do not V$_1$ so, I V$_2$ so* is not uncommon in spoken English and in written genres characterized by a low level of formality, such as blogs and discussion forums. Recognition of this fact has prompted this case study on the apparently special relation between *think* and *know* within the wider class of verbs of cognitive attitude and on the opportunity to consider them as antonyms.[2]

To investigate these matters, both naturally occurring and elicited data were taken into account. The main source of authentic data was the World Wide Web.[3] Despite awareness of the limitations of data retrieved from the Internet, resorting to its use was necessary because this kind of opposition is obviously more common in informal and substandard varieties of English and examples are found in less formalized genres than those sampled in the available corpora.

More data were elicited by asking 60 native speakers of English to complete a questionnaire. Specifically, the questionnaire was given to 30 native speakers of American English, 23 native speakers of British English and 7 native speakers of other, non-specified varieties of English. The informants were between 25 and 65 years old and endowed with a medium to high level of education. They were asked to provide opposites for a list of words out of context that included adjectives (e.g., *hot*, *tall*, *happy*), adverbs (e.g., *fast*, *kindly*) and verbs (e.g., *live*, *stand up*, *believe*, *think*, *know*). No significant differences in the answers connected to the different varieties of English spoken by the informants were observed.

Responding to the stimuli words *know*, *think* and *believe* out of context, the informants suggested a variety of antonyms. They were unanimous in indicating *cold* as the opposite of *hot* (100%), and there was a wide agreement in providing *black* as the opposite of *white* (90%), and *small* as the opposite of *big* (60%). The percentage decreases significantly when providing the opposite of *think*: 30% of the informants chose the negative form of the verb, *don't think*, as the opposite. Interestingly, 25% said *know*, and 10% said *doubt*. The same diversification of answers characterizes the answers provided for *know* and *believe* (see Figures 4-6).

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2   In this article, the term antonymy is used as a cover term for different types of oppositions and not in the sense of a specific type of oppositeness as in Croft and Cruse (2004).

3   The data retrieved from the Internet were verified to ensure that the writers were native speakers of English. To do this, the authors of the texts where the data occurred were contacted.
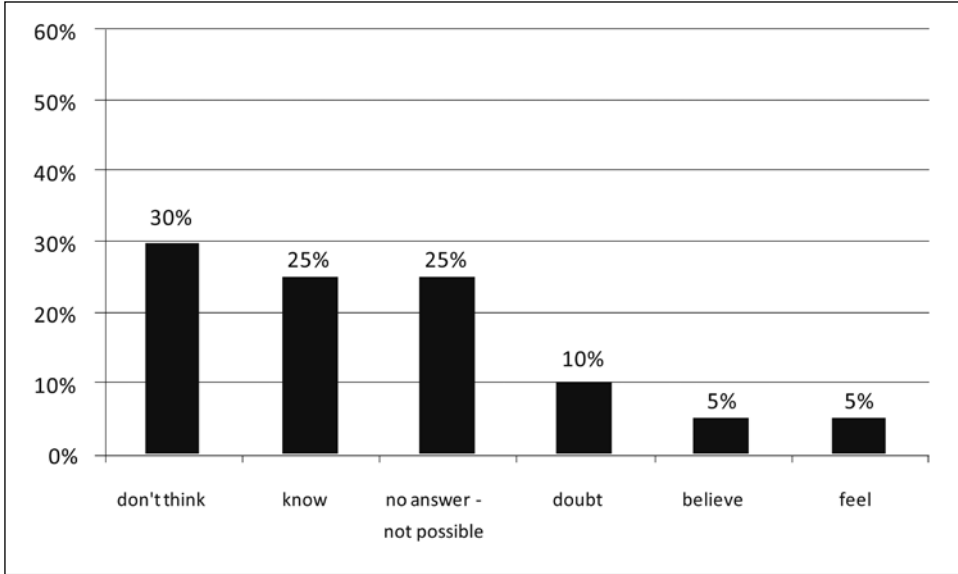
Fig. 4 – Opposites of think
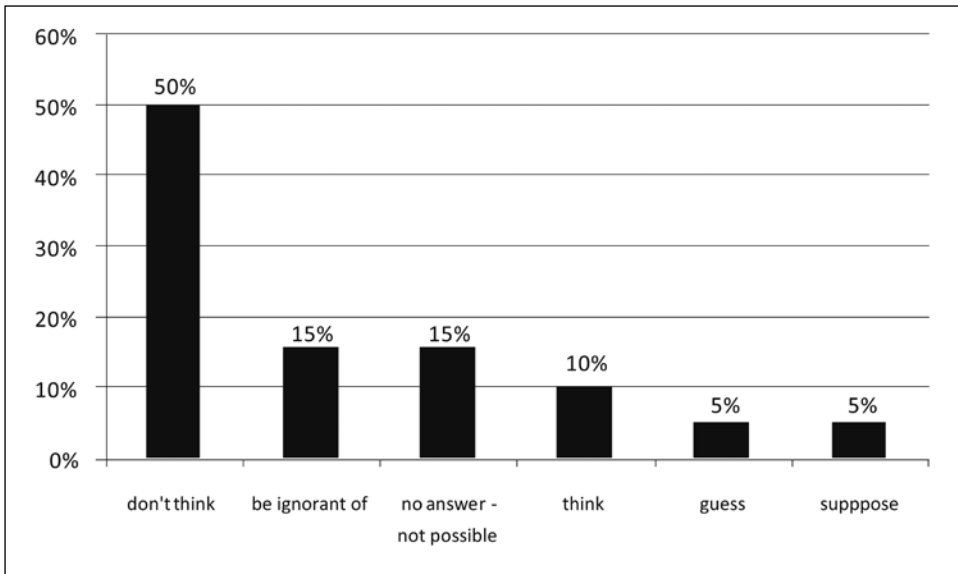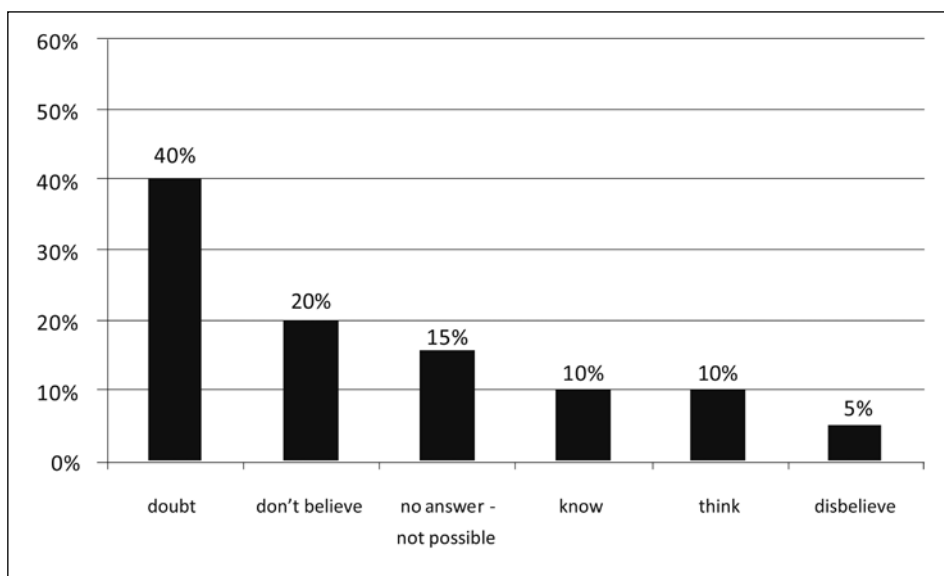

Fig. 5 – Opposites of know

Fig. 6 – Opposites of believe

The informants' data seem to support the hypothesis that *know*, *think* and *believe* have a special relationship within the class of English verbs of cognitive attitude. Both *think* and *believe* appear in each other's set of antonyms and *know* was chosen as one of the antonyms in both cases. The informants' answers suggested other members of the class, such as *doubt* (given as the antonym of both *think* and *believe*), *feel*, *suppose* and *guess*. It is particularly interesting that the last two were suggested as antonyms for *know*, whereas no informant proposed *believe* as an option.

Despite this variety in the informants' answers and the difficulty of classifying *think* and *know* as proper antonyms, they are indeed often chosen as preferred antonymic couple to occur in the frame at issue, namely "I don't *V so*, I *know so*", as in (1)-(3) below:

1. "Wow, do you really think so?" I fished. "**I don't think so, I know so**!" was this genius's reply.

2. — Oh you're smiling now, dude, but in a couple of minutes that smile will be long gone. It ends here. Right now.
   — You think so?
   — **I don't think so. I know so**. You see, I've been doing my research.

3. Thomas: "Let me get this straight. You think that the entire world is getting dumber?"
   Ross: "No, **I don't think so. I know so**. It's a known fact that the world is devolving into chaos."

As many studies have underlined (Fellbaum 1995; Jones 2002; Murphy 2003; Paradis and Willners 2006), pragmatic and contextual factors can favor the antonymic

construal of two words that would not be recognized as opposites in a neutral context. The possibility for *know* to be opposed to *think* could therefore be explained by saying that its occurrence in this syntactic structure forces this particular construal.

This type of effect has been acknowledged by several studies. Jones (2002) accounts for the fact that even words that are not antonyms in neutral contexts are interpreted as such in negated frames of the type "*y* not *x*" where an antonym is negated to emphasize the other (Murphy 2003: 204). Fellbaum (1995: 295) discusses the rhetorical effects that can be achieved through the co-occurrence of antonyms in particular syntactic patterns such as the one at issue here, namely "not *x* but *y*". The antonymic effect may be strengthened by the fact that *know* is inserted in a syntactic pattern in which it is generally not possible to use the verb, namely *I V so*: whereas *I think so* is common, *I know so* in isolation is actually quite rare and nonstandard.

Know is found in opposition to *think* and – much more rarely – to *believe* as in (4) and (5):

> 4. KK: I play different roles at different times. For different people. In this crazy world, only the truly sane man appears to be mad. Look at me. Do you think I'm mad? Do you think I can be manipulative?
> PN: How would I know?
> KK: Of course you would know. It's so easy to judge a man by just looking at him. You look at these film people and you instantly know they're rogues.
> PN: I believe so.
> KK: **I don't believe so. I know so.** You can't trust them an inch. I have been in this rat race for so long that I can smell trouble from miles afar.

> 5. Is there a contradiction in the word of God? **I don't believe so... I know so.**

These examples come from the World Wide Web. Examples (4) and (5) were actually the only two found by the Google search engine in which *believe* and *know* are opposed. This kind of opposition with *think*, on the other hand, is common: more than 40,000 cases were found through http://www.google.com.[4] It is interesting that no occurrences of *know* in opposition to other verbs of cognitive attitude (e.g., *suppose*, *assume*, *reckon*, *presume*) were found. This datum is remarkable in itself because it seems to indicate that the possibility of occurring in the frame "I don't *V* so, I know so" is in fact restricted to a limited number of members of the class of verbs of cognitive attitude.

Although in particular contexts, *know* could be used as an antonym for other verbs of cognitive attitude, in fact not a single occurrence of such uses could be found. This fact shows, in my opinion, that this possibility is at least dispreferred and is much less common than the opposition with *think* and *believe*.

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4   No occurrence of this pattern was found, however, in the corpora queried, namely the British National Corpus, the ICE-GB and the ICAME corpora.

These considerations bring about several questions which the next sections attempt to answer. First, a hypothesis is examined relative to the evident preference for *know* to be opposed to *think* and *believe* alone. The kind of relation construed in these cases is then discussed to determine whether it is a real case of antonymy or a case of intensification produced by the upper-bound interpretation of negation. Finally, the discussion turns to the relationship between this type of lexical contrast and the opposition between the affirmative and the negative forms of these verbs, in particular with respect to *I know* vs. *I don't know*.

4. Why only *think* and *believe*?

Semantic and pragmatic considerations can help answer this question. As pointed out in section 2.2, verbs of cognitive attitude are highly complex lexical items (Cappelli 2007a, 2007b). In terms of the contrasts that emerge within the system, verbs of cognitive attitude to a certain extent can be compared with emotion adjectives like *happy/sad*, among which only certain pairs are privileged as antonyms (Murphy 2003). Similarly, the "contrast set" that these verbs form can be considered a case of non-binary non-canonical contrast. In the case of the contrast created in discourse between *think* and *know* and *believe* and *know*, the binarity could be seen as "binarity for binarity's sake" (Murphy 2003: 182) in that, in principle, more items are available for contrast. However, *think* and *know* (and to a limited extent *believe* and *know*) are privileged as opposites in the particular structure at issue and sometimes also in neutral contexts, as shown by the free word-association task discussed in section 3.

Murphy's (2003) principle of Relation by Contrast – Lexical Contrast (hereafter referred to as to RC-LC) seems to explain these preferences in a satisfactory way. RC-LC claims that "a lexical contrast set includes only word-concepts that have all the same contextually relevant properties but one" (p. 170). Since verbs of cognitive attitude lexicalize the interplay of evidentiality and epistemicity, identifying one single property that differs among them is not easy. Moreover, the most relevant property in which they differ might not be the only one.

The main claim proposed in this article is that, whereas with the opposition *believe-know* antonymy is pragmatically created, with the opposition *think-know* semantic and pragmatic factors can produce either antonymy or intensification. To clarify this claim, a brief overview of the main semantic features of the three verbs is necessary.[5]

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5   The reader is referred to Cappelli (2007b) for a thorough discussion of the semantics and pragmatics of *know*, *think* and *believe* also with respect to the other members of the class of verbs of cognitive attitude.

4.1. *The information lexicalized by* know, think *and* believe

Know generally lexicalizes the fact that the speaker assigns the maximum degree of likelihood to a state of affairs (*p* from now on) with a high level of certainty on his or her part. In other words, the evaluator signals certainty that his or her epistemic assessment of the state of affairs allows him or her to hold *p* at least as maximally likely. Moreover, in the absence of refutations, by default, he or she would probably not hesitate to say that *p* is true.

The reason speakers sometimes choose to state explicitly that "they know that *p*" rather than simply asserting "*p*" is plausibly that they wish to foreground their reasons for supporting the truth of *p*. *Know* thus lexicalizes the fact that the evaluator has evidence to maintain that *p* is the case. The truth of the state of affairs may then be inferentially derived by default when the hearer has no reason to doubt the reliability of the evaluator's words. As a consequence, the high level of likelihood assigned to *p* makes it a piece of information available for further inferential processes. Thus, in (6) *p* is assigned the highest possible likelihood value, and the admiration of the evaluator is grounded in his or her conviction that Jack is in fact a master chairmaker:

6. **I know** that Jack is a master chairmaker and I admire what he does.

In line with these considerations, the verb *know*, in its most common qualificational sense, can be considered a true marker of evidentiality (Cappelli 2007a). Its tendency to occur in contexts in which explicit reference to evidential information is made seems to provide support to this hypothesis:

7. As **I know** *from my own experience*, crack, or free-base, is highly addictive, but in a psychological rather than a physical way.

The nature of the evidential information on which the epistemic evaluation of *p* is based can be either encoded or inferred from the context. From a semantic perspective, the meaning potential of the verb does not include any reference to specific types of evidence: knowledge can derive from perception, hearsay, inference and any other reliable evidence available to the evaluator.

Believe is generally used by the speaker to express his or her personal opinion relative to a state of affairs in a committed way. The strength of the speaker's commitment can vary depending on contextual factors. The degree of likelihood assigned to the state of affairs is not as well defined as in the case of the propositions qualified by *know*, but it is nonetheless clear that *p* is assigned a positive value along the epistemic scales. In other words, the speaker allows for the possibility that *p* is true. The speaker also seems to position his or her stance in the uncertainty domain by favoring the possibility that *p* is true without being certain; that is, the speaker cannot guarantee the truth of *p*. Yet, by using *believe*, the speaker conveys a high "involvement" in the likelihood of *p*, although still "standing" in the domain of uncertainty.

Believe is used when the speaker wants to commit himself or herself to the evaluation on the grounds of some sort of affective evidence. When focus is on evidentiality, the speaker's commitment is fairly high. If the epistemic domain is foregrounded, the verb lexicalizes that the evaluator is quite confident that *p* is the case, and he or she supports his or her attitude toward the proposition in a committed but retractable way. This hypothesis on the role of affective evidentiality in the semantics of *believe* finds support in the investigation of its adverbial modification. Affective evidence is in fact modulated by adverbs like *passionately* and *strongly* that would not be acceptable with verbs that do not point toward this type of evidential dimension (e.g., *think*):

8. 'I **passionately** believe by working as a team we can help young people to lead happy and successful lives,' he said.

9. I **strongly** believe that if someone says to me, 'I've had my house interior designed,' it's just meaningless rubbish.

Think is a purely epistemic verb that lexicalizes the evaluator's assignment of a positive degree of likelihood to *p*, while leaving the possibility open that he or she is wrong. *Think* also seems to lexicalize reference to a rational evaluative process that has as an output the opinion of the evaluator on the basis of the available evidence. The evidential dimension, however, is not inherent in the semantic potential of the verb but is supplied at the level of the context. As a consequence, whereas *believe* and *know* lexicalize a medium to high level of commitment to the evaluation, *think* does not seem to be as strict in this concern. In fact, *think* allows the evaluator to express varying degrees of uncertainty according to the context (Lehrer 1974). In other words, the evaluator signals that he or she is not certain whether *p* is true but collocates it on the positive side of the likelihood scale.

Think can therefore be considered neutral as to evidentiality and vague as to the subject's certainty. Where evidence is provided by the context, the evaluation encoded by the verb is construed as the output of a computational process. On the contrary, where the context does not make explicit reference to the reasons for the evaluator's attitude, *think* indicates only that what follows is the speaker's subjective judgment, that is, his or her personal opinion.

Because of this extreme context sensitiveness, the meaning of *think* can be construed to perform several functions (Cappelli 2007a, 2007b). It can have a "prototypical cognitive attitude verb function", namely that of signaling epistemic evaluation. In this case, *I think* qualifies "factual theses", that is, verifiable states of affairs, and can be paraphrased with other expressions signaling probability (e.g., *probably*). When it has this function, it generally expresses tentativeness (Aijmer 1996; Cappelli 2007a) as in (10).

10. He won't be er, but she was so she said you're gonna chop the tree down, that tree whe, that he bumped into! But **I think** he won't do that again. [≈ *But he probably won't do that again*] Will he?

I think can also have a "bleached cognitive attitude verb function", namely, that of signaling the speaker's viewpoint. In this case, it occurs with non-verifiable, evaluative propositions and the epistemic scale of likelihood is either not lexicalized or is lexicalized only in the sense that *p* is considered generally true by the evaluator. The only dimension brought to the foreground is the commitment dimension and *I think* ends up marking that what follows is the speaker's point of view as in (11).

> 11. So the piece was solicitous in trying to alleviate the shocks by explaining that the novelist himself was shocked. And **I think** it was right to argue that the book has its "strict disclaimers" and that goodness of heart, chiefly Jenny's, is defensively displayed amid a welter of misconduct.

This use of the verb is common, especially in argumentative contexts such as political debates, in which *think* assumes a more "deliberative" function (Simon-Vandenbergen 2000) that conveys authority rather than uncertainty as in example (12).

> 12. This president has left them in shatters across the globe, and we're now 90 percent of the casualties in Iraq and 90 percent of the costs. **I think** that's wrong, and **I think** we can do better.
> (*Senator Kerry, The First Bush-Kerry Presidential Debate, 30 September 2004*)

Think can be used as a politeness-strategic device, for example, for "corrective face-work" (Brown and Levinson 1987), as a hedge or downtoner as in example (13).

> 13. **I think** we'd better have a talk.

In some extremely rare cases, *think* can be used as a "cognitive discourse marker" (Chafe 1993), although this use is infrequent and the verb tends co-occurs with some other discourse marker:

> 14. Well, **I think** – *listen*, I fully agree that one should shift tactics, and we will, in Iraq. Our commanders have got all the flexibility to do what is necessary to succeed.
> (President Bush, The First Bush-Kerry Presidential Debate, 30 September 2004)

Given the complex nature of *think* and the many functions that it can have in discourse, two opposite effects may be produced when *think* and *know* are contrasted in the syntactic pattern investigated. When *think* is construed in its prototypical cognitive attitude meaning and it lexicalizes the epistemic evaluation of the speaker, then *know* always functions as its antonym, as in (15). When, on the other hand, the semantic content of *think* is bleached, and the verb is used to signal the speaker's viewpoint as in (16), then *know* is interpreted by some informants as a sort of intensifier of the speaker's commitment by virtue of the upper-bound interpretation of negation (Horn 2004; Paradis and Willers 2006).[6]

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6   The present discussion does not take these cases into account and focuses only on the cases in which

15. "A: d'you think Dr. Luby will lead a theater trip to Broadway in New York City again this year?" "B: **I don't think so. I know so!** and I've already signed up for it."

16. "At the risk of unnecessarily adding validity to the nihilistic position, do you REALLY think that black folks as an aggregate will do much to break free from our racial subordination?" […] "**I don't think so, I know so.** It's a matter of putting in work, individual by individual, family by family, […]."

4.2. The contextually relevant properties that allow the antonymic construal

Negation is responsible for bringing to the foreground the relevant properties of *think* and *believe* making them available for contrast and for relegating the other dimensions lexicalized to the background. Thus, *know* occurs in contrast with *believe* because they both lexicalize a strong commitment of the evaluator toward the likelihood of a state of affairs on the basis of some sort of evidence, which makes them most similar in the contrast set. The evidential dimension toward which the two lexical items point, however, is of a very different nature. On the one hand, *know* lexicalizes reference to a verifiable, objective evidence sufficient to assess *p* as true for the evaluator; on the other hand, *believe* lexicalizes reference to some sort of "affective evidence" (Cappelli 2005, 2007a, 2007b), which is generally not verifiable and is based on the evaluator's "emotional ego".

The opposition is therefore putatively pragmatically construed when the speaker wants to contrast the reliability of the evidence on which the epistemic assessment is founded. *Know* and *believe*, in fact, only differ in the type of evidence lexicalized (verifiable evidence vs. affective evidence); hence the opposition is created at the level of the implicatures derivable from the status of the evidence itself:

	Epistemicity		Evidentiality
	Likelihood	Certainty	
know	high	high	verifiable
believe	high	high	affective

Fig. 7 – The dimensions lexicalized by know *and* believe

the two verbs are clearly used as antonyms. The reason why some native speakers interpret cases such as (16) as instances of intensification might be that *think* is construed in its "bleached" cognitive attitude sense when the evidence available is insufficient. In these cases, the verb encodes the fact that the subject is only "fairly" committed to the truth of *p*. *Know*, on the other hand, encodes "strong" or even "absolute" commitment to the truth of *p*. As a consequence, some informants feel that, in cases such as those exemplified by (16), the relation between *think* and *know* is not a real instance of opposition: rather, it is an intensification of the subject's commitment. The foregrounding of different dimensions seems therefore responsible for the effect. The cases in which opposition is created are discussed in section 4.2.
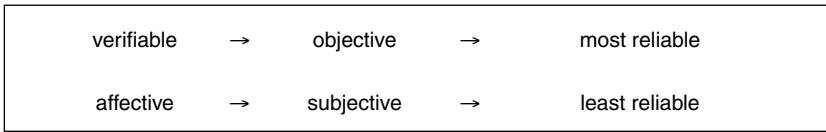
verifiable	→	objective	→	most reliable	
affective	→	subjective	→	least reliable	

Fig. 8 – Verifiable vs. affective evidence

The most common opposition between *think* and *know* is also both semantic and pragmatic. The contrast is created at the level of the epistemic information lexicalized, more precisely in the domain of the evaluator's certainty. As explained in section 4.1, *think* does not bear reference to any type of evidence; that is, it is a purely epistemic verb. It signals a general preference to consider the state of affairs described in the embedded proposition as situated on the positive side of the likelihood scale. The evaluator's commitment, however, cannot be placed on any specific ideal point along the scale of certainty. We can say only that the verb can cover a large portion of the positive side of that scale. The commitment of the evaluator to his or her evaluation is construed in different degrees depending on pragmatic and contextual factors (Lehrer 1974; Cappelli 2005, 2007b).

When used as a purely epistemic verb, *think* signals that the speaker holds a certain state of affairs as possible, but that he or she *is not* certain. *Know*, on the contrary, implies that the evaluator *is* certain by virtue of the evidence he or she has to support this judgment. The absence vs. the presence of evidential information lexicalized supports the opposition, but the antonymy is created along the axis of certainty. In this particular construal, *think* and *know*, in what we can define as their prototypical epistemic use, come to represent the two poles of the scale of the evaluator's certainty, along which they can ideally be symmetrically placed. It is the reference to this more basic opposition, namely, *certain* vs. *uncertain*, and the gradable nature of uncertainty that offer the basis for the creation of antonymy.
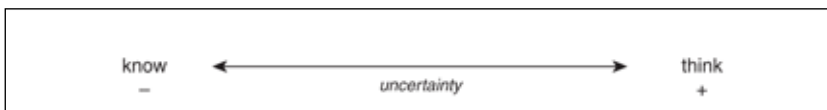

Figure 9 – The opposition of know/think

Think can therefore be envisaged as the privileged antonym of *know* when the contrast is produced in the epistemic domain, whereas *believe* can be considered the privileged candidate when the contrast involves the domain of evidentiality. It would be interesting to investigate in detail the rate at which these verbs co-occur with each other and to compare this rate with their co-occurrence with the other verbs of cognitive attitude. A tendency for antonymic lexical items to co-occur more frequently has been widely observed (Willners 2001; Jones 2002; Murphy 2003).

The reason for this evident preference for *think* and *believe* to be privileged as antonyms for *know* can be traced to the fact that they are maximally similar and, ultimately, maximally diverging at the level of one relevant property (objective and reliable vs. subjective and non-reliable evidence, certainty vs. uncertainty). The other verbs of cognitive attitude lexicalize the semantic middle ground (Murphy 2003: 189-190) and consequently contrast on more than one property. They could be considered near-opposites at best because of the multidimensionality of the conceptual domain lexicalized by verbs of cognitive attitude (Lehrer and Lehrer 1982).

5. Conclusions

Collocating the opposition of these verbs within one of the "traditional categories" of antonymy is difficult given the complex nature of the lexical items and their opposition. *Think*, *believe* and *know* obviously can be contrasted with their negative forms and most informants did actually provide negative forms of the verbs as their opposite (eg., *think/ don't think*, *believe/don't believe*, *know/don't know*).

The opposition created by the occurrence of these verbs in the syntactic pattern discussed, however, does not seem to be just one possible alternative to the negative form of the verbs. Rather, different elements, i.e. the use of the verb *know* in a marked syntactic pattern, result in the dynamic selection of the "portions" to enter into the construal of this "contextualized interpretation". The occurrence in the negated frame *I don't think/believe so, I know so* helps to convey a wide range of pragmatically-created additional meanings which are not always easy to discern. Thus, while some informants interpret an occurrence of this pattern as an instance of lexical opposition, others may interpret the very same occurrence as a case of "intensification. To conclude, even though "the emergent scenario is one of greater complexity because the system is forced to face new properties of its constituents and a new dynamics among them, with less predictable results and more variables involved", this choice of a less natural/more marked solution" may prove "favourable for the success of the speech event as a whole" (Merlini Barbaresi 2003: 26).

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