SEMANTIC COMPETENCE

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The notion of linguistic competence was introduced by Noam Chomsky (1965: 3–4) to designate knowledge a speaker/hearer has of her own language, as distinct from her performance, i.e., her actual use of language. It is the task of linguistics to infer competence from performance, in spite of the many factors, besides competence, that contribute to the latter. A description of competence is called a grammar. What a grammar aims at describing – competence in a language – is an aspect of a speaker's mind, though not one of which speakers themselves are aware: mental processes a grammar deals with “are far beyond the level of actual or even potential consciousness” (Chomsky 1965: 8).

Chomsky insisted that linguistic competence was not to be conceived as a practical ability or a kind of know-how. Ability to use a language may decline or even be lost because of some injury without the underlying knowledge being affected, as is shown by the ability being recovered once the injury’s effects recede (e.g., Chomsky 1985: 9). It appeared to follow that competence is a form of propositional knowledge; but, as many philosophers objected (see e.g., Stich 1971), how could it be, as it was both unavailable to consciousness and unjustified? Chomsky’s response was that our indisputable ability to differentially assign the appropriate meanings to phonetic structures, to tell well-formed from not well-formed sequences of sounds, etc., showed that we were in some epistemic relation (for a while, he called it “cognizing”) with rules and principles such that, if “miraculously” we became aware of them, we would not hesitate to call our relation to them “knowledge” (Chomsky 1980: 70).

Only more recently (1999–2000) he distanced himself from the notion of knowledge of language (or of grammar), arguing that

one should not expect such concepts [including knowledge of language] to play a role in systematic inquiry into the nature, use, and acquisition of language and related matters any more than one expects such informal notions as “heat” or “element” or “life” to survive beyond rudimentary stages of the natural sciences.

Chomsky and Stemmer 1999: 396

This move was part of a more general anti-intentionalist turn, rejecting intentional vocabulary in favor of internal states and computational mechanisms (Chomsky 2000: 23). Such a turn may well be connected with the evolution of “substantial” Chomskyan linguistics: from the
principles and parameters phase to minimalism, the focus has been on high-level entities such as principles, parameters, and procedures like Merge, that are not plausible candidates for being objects of a speaker’s knowledge in the intentional sense (Matthews 2006: 204–207).

Chomsky consistently believed that no single part or aspect of linguistic competence corresponded in content to the philosophers’ semantics; particularly, the philosophers’ “theory of reference” was no part of the scientific study of language. The notion of reference as a technical notion introduced by some philosophical theories, if at all coherent, seems to Chomsky to be irrelevant to the scientific study of natural language (Chomsky 2000: 40–42, 150–152), whereas as an ordinary notion it is not a conceptual tool of any science but an object of study for ethnoscience, the study of folk-scientific conceptions (Chomsky 2000: 172–173). However, he conceded that some phenomena philosophers would regard as semantic – e.g., pronominal anaphora, distinctions such as mass/count and telic/atelic, analyticity, and more – were indeed relevant to the science of language. Some of them were to be brought back to syntax: e.g., in some cases syntactic principles determined semantic properties (as with pronominal anaphora), while in others, semantic properties constrained syntax. For example, in Italian some verbs require the auxiliary avere (to have) when they form atelic verbal predicates, whereas they require essere (to be) when they form telic predicates:

Gianni ha/*è corso
[John ran]
Gianni *ha/*è corso a casa
[John ran home]

Higginbotham 1997: 108

That Chomsky himself tended to regard properties such as telic as syntactic, whereas others, working within his program broadly understood, chose to see them as semantic doesn’t make much difference: the point is that principled connections involving syntax should be considered as part of linguistic competence in the narrow sense. Other allegedly semantic facts and properties, such as hyponymy, analyticity, selectional restrictions, etc., were instead excluded by Chomsky from the core of grammar and ascribed to the conceptual-intentional module of the language faculty, hence part of linguistic competence in the broad sense. Still others, e.g., that “Hesperus” and “Phosphorus” are coreferential or that “water” refers to H2O, were definitely outside the scope of linguistic theory.

Meanwhile, in the work of Donald Davidson and Richard Montague and his school, “philosophical” semantics of natural language had been developing (since the late 1960s) along the path that had been traced by Frege, Russell, Wittgenstein, Tarski, Carnap, Church, and Quine among others, hence on the pattern of semantics for artificial languages such as the languages of logic. The two main programs, Davidson’s and Montague’s, though differing in important respects, agreed in identifying the aim of semantics with providing “an account of how the meanings of sentences depend upon the meanings of words” (Davidson 1967: 304; cf. Thomason 1974: 52), i.e., with bringing out the compositional rules that compute the meanings of complex expressions from the meanings of their constituents. In Montague’s more developed version, such semantic compositional rules “mirrored” syntactic rules throughout: to each syntactic rule of formation for a type of complex expressions (such as noun phrases, verb phrases, etc.), a semantic rule corresponded that computed the semantic value of expressions of that kind from the values of its immediate constituents, as singled out by syntactic analysis (≈ “rule-by-rule” compositionality). Montague’s syntax was ad hoc: it was designed to facilitate
compositional semantics and didn’t claim psychological plausibility (i.e., it was not regarded
as a component of linguistic competence). Montague famously believed that semantics was
part of mathematics, not of psychology. Davidson paid some tribute to Chomsky’s early work,
hinting at a possible “rapprochement” between generative grammar and “a sound theory of
meaning” (Davidson 1967[1984]: 30); in fact, he made no use of Chomskyan grammars, relying
instead on syntactic analysis of logical languages as exemplified in Frege’s and Tarski’s work (and
occasionally extending it).

Originally, neither Davidson’s truth-theoretic semantics nor Montague’s model theoretic
semantics were intended to be models of human semantic competence. Compositional semantic
rules were not meant to reflect or explicate actual semantic processing of language: they were
intended to yield the right truth conditions for sentences of a natural language such as English,
where “language” is understood as public language (not an idiolect) under its standard inter-
pretation. Both theories were subject to empirical test: in Davidson’s case, the theory had
to fit our intuitive knowledge of the conditions under which a sentence is true (Davidson
1970[1984]: 61–64); in Montague’s case, the theory had to fit our intuitions of semantic ambi-
guity and – prominently – our inferential intuitions: inferences that came out valid according
to the theory would be recognized as such by a normal speaker. This raises the issue of so
called “material” inferences (a normal speaker would infer “Milan is south of Berlin” from
“Berlin is north of Milan”, though not by way of logic): Montague’s theory would validate
such inferences as well, provided it is augmented with the appropriate meaning postulates (on
which see below) (Thomason 1974: 51–55). But in spite of both theories being controlled by
the speakers’ performance and their assessment of it, neither was intended as a theory of human
language processing.

In both cases, however, more recent versions took a “cognitive” turn. Davidsonian semantics
was presented as “a component of the larger enterprise of cognitive linguistics”, spelling
out the content of the specifically semantic module of the language faculty (Larson & Segal
1995: 22–24); Montagovian semantics, in turn, was described as internal to the generative trad-
ition and aiming at modelling a speaker’s competence, more particularly, semantic competence
(Chierchia & McConnell-Ginet 1990: 2–6). Such a turn, however, did not appear to involve
special attention to psychological or neurophysiological plausibility, let alone grounding, of the
semantic categories and processes that were conjectured.

Among objections to the dominant semantic programs, one was prominent: both truth-
theoretic and model-theoretic theories specified lexical meanings to a very limited extent. But
without a fuller account of the meaning of words, a semantic theory cannot claim to be
describing sentential meaning either, i.e., what a speaker comes to know when she understands
a sentence. The objection was first raised by Michael Dummett (1975) in connection with
Davidsonian truth-theoretical semantics. Dummett argued that statements of truth conditions
such as “‘The moon is round’ is true if and only if the moon is round” do not account for a
competent speaker’s knowledge of the meaning of “The moon is round”; moreover, adding that
“the moon” refers to the moon, while “is round” refers to the property round does not signifi-
cantly improve on the amount of information provided. A full-blooded theory of meaning for
a language L would both explain what it is for a speaker to grasp the concepts expressible in
L (e.g., the concepts moon and round) and associate each concept with an expression of L; or
in other words, it would explicitly state what it is for a speaker to grasp the meanings of such
expressions (Dummett 1975: 101). Some noticed that statements of truth conditions did pro-
vide some lexical semantic information, as they made a sentence’s “logical skeleton” explicit,
thereby informing about the logical type of every lexical item involved (e.g., “the moon” is a
noun phrase, so it cannot mean red or run) (Higginbotham 1989). The same could be said in
favor of model-theoretic semantics à la Montague, which explicitly specified the logical type of each lexical item. However, it had to be conceded that this was much less than a Dummettian full-blooded theory was supposed to explain.

Concerning Montague-style model theoretic semantic theories, the objection took a somewhat different form. Proponents of such theories believed that much of lexical meaning could be spelled out by integrating the theory with meaning postulates, i.e., statements like “For every x, if x is red then x is colored” or “For every x, x is a bachelor if and only if x is an unmarried male”. However, Barbara Partee remarked that no amount of meaning postulates could “tie down the intensions to their extralinguistic content” (Partee 1981: 71), i.e., determine the lexical items’ reference. Partee’s difficulty (as well as Grandy’s (1974), to which she referred) was that though meaning postulates are informative about semantic relations among lexical items, they (obviously) do not tie down any of them to a reference in the real world (or in any possible world). Hence, a system of meaning postulates, no matter how extensive, does not fully encompass a speaker’s lexical competence, which supposedly includes knowledge of reference. In Partee’s words, some language-to-world grounding was needed (1981).

It may be surprising that such objections were raised, as proponents of both truth-theoretic and model-theoretic semantic theories had been fully aware that they were about the dependence of sentential meanings on word meanings, i.e., that they were, essentially, theories of the semantic import of syntax. Indeed, some believed that this was (almost) all that semantics, properly understood, could be. “We should not expect a semantic theory to furnish an account of how any two expressions belonging to the same syntactic category differ in meaning” – e.g., explicitly to distinguish the meaning of “cat” from the meaning of “table” – for that is a dictionary’s business, and “the making of a dictionary demands considerable knowledge of the world” (Thomason 1974: 48). This response, of course, presupposes a sharp distinction between semantic knowledge and world knowledge, which, besides being at odds with Quine’s famous criticism of the analytic/synthetic distinction, may not fit our intuitions about semantic competence. Later, indeed, others would agree with Thomason about the limits of semantic theory as part of linguistics, while recognizing that, exactly because of such limits, what went under the name of “semantics” was not quite a theory of meaning; semantic theory “[has] nothing at all to say about our recognitional capacities” (on which our lexical semantic competence is partly based); hence, “we cannot expect that a linguistic semantics … could deliver the full meaning of any particular utterance” (Higginbotham 1997: 105).

Concurring criticism of the limitations of formal semantics came from cognitive psychologists and computer scientists working in natural language processing (a sub-field of AI). For example, Philip Johnson-Laird pointed out (like Partee) that “unless a theory relates language to the world … it is not a complete theory of meaning”, and that meaning postulates were adequate to the task (Johnson-Laird 1983: 230); in the same spirit, he insisted (like Grandy) on some procedural fleshing out of lexical intensions, which would explicitly exhibit “what has to be computed in order to specify [a word’s extension]” (Johnson-Laird 1983: 172–173). Such desiderata had partly been fulfilled by Terry Winograd’s system SHRDLU (Winograd 1968–70; see Winograd 1972), in which lexical items (both monadic predicates such as “red”, “big”, and “cube”, and relational predicates such as “on” and “taller than”) were associated with procedures that identified objects and verified sentences in a virtual world of geometrical solids. SHRDLU looked like a toy model of one side of what Diego Marconi (1997) would later call “(lexical) referential competence”, i.e., the ability humans have of singling out objects and relations in the real world to which a word applies (“application”) and of verbally categorizing real objects and relations (“naming”). However, in SHRDLU, objects and relations were not accessed through perception; they were identified by proper names and described by nested predicates (e.g., B5
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is a PYRAMID hence a MANIPULABLE OBJECT hence a PHYSICAL OBJECT). Thus, SHRDLU only pretends to be relating natural language words and sentences to a drastically impoverished “world”; in fact, it maps a fragment of natural language onto an artificial language.

Nevertheless, research leading to systems like SHRDLU was witness to the widespread opinion that a complete theory of meaning ought to relate language to the world, which required explicating the meaning of individual words. Partee (1981) introduced a distinction between structural semantics, dealing with the syntax-guided processes that build the semantic content of a complex expression from its constituents’ contents, and lexical semantics, the characterization of the semantic contribution of words (it should be noted that, in linguistics, the phrase “lexical semantics” has also been frequently used for the analysis of the internal structure of the meanings of lexical items). Partee argued that while Montague-style formal semantics could be regarded (in principle) as implementing the structural side, its tools (i.e., meaning postulates) were radically insufficient to account for lexical meaning. In this context, she raised the issue of how lexical meaning could be grounded in words-to-world relations. The issue of “symbol grounding” (Harnad 1990) was widely discussed in the 1980s, often in response to John Searle’s skepticism about artificial implementation of linguistic competence, based on his famous “Chinese room” thought experiment (Searle 1980). Searle’s point was about AI; however, it easily generalized to any model of human competence. The point was that understanding could not consist of purely intralinguistic operations; hence, competence could not be identified with the ability to carry out such operations, as in translation, paraphrase, inference, etc. (Marconi (1997) would later collectively describe such abilities as constituting inferential competence.)

Essentially, two ways out of the Searlian predicament were proposed, one internalist, the other externalist; the latter, in turn, bifurcated into a cognitive and a non-cognitive view. Internalists such as Johnson-Laird (1983) and Ray Jackendoff (1992) thought that grounding did not require any connections with the external world: words got their meanings by being connected with internal representations and processes. This view was later appropriated by supporters of the “simulationist” paradigm (see below). Cognitive externalists such as Harnad and, later, Marconi believed instead that competence with lexical items was (partly) based on perceptual and motor connections with the world out there; e.g., knowing the meaning of words such as “pear” or “bed” involved both the ability to perceptually recognize pears and beds and the ability to appropriately respond, e.g., to commands involving such things. Non-cognitive externalists, such as Hilary Putnam (1975), thought that for many words – typically, though not exclusively, for names of natural kinds – grounding was brought about by objective causal connections with objects and properties in the environment, whether or not such connections affected the speaker’s cognitive system. For example, in Putnam’s celebrated Twin Earth thought experiment, Oscar and his Twin use “water” for two very different substances (H₂O and XYZ), even though their brain states are supposed to be identical. Oscar uses “water” to refer to H₂O because the word was originally introduced to name a substance that turned out, much later, to be H₂O; since its introduction, however, the word referred to whatever had the same nature as that stuff (namely H₂O) even though individual speakers, or even the whole linguistic community might not know about H₂O and, a fortiori, be unable to tell whether something is H₂O. Partee herself, in raising the grounding problem, appears to suggest some sort of reconciliation of Putnamian and cognitive externalism (Partee 1981: 68).

Concerning how to accommodate semantic competence within their framework, externalists disagreed. Putnam thought that a speaker’s individual competence with a word W consisted in “some particular ideas and skills” connected with W; he particularly emphasized the role of stereotypes, mini-theories associated with W that specified salient properties of typical members
of W’s extension (i.e., that water is a liquid, transparent, thirst-quenching, etc.). Though stereotypes, far from determining the extension of W, might even be false of many of its members, Putnam eventually regarded the stereotype as a component of meaning (Putnam 1975: 269), thus as having semantic import. Indeed, he pointed out that “once we give up the idea that individual competence has to be so strong as to actually determine extension, we can begin to study it in a fresh frame of mind” (Putnam 1975: 246). By contrast, Michael Devitt identified individual competence (e.g., with the word “tiger”) with a speaker’s appropriate placement in a network of causal chains associated with the word: “a network involving other people’s abilities as well as groundings and reference borrowings” (Devitt 1983: 89). A speaker’s competence with “tiger” does not require any propositional beliefs (such as “Tigers are striped”, etc.); it suffices that her thoughts be “grounded in tigers” (Devitt 1983: 89). Devitt was willing to make some room for a speaker’s ability to, e.g., recognize a tiger when she sees one; however, the respective weights of individual abilities (and beliefs) and objective groundings were not specified.

Internalist “grounders” often tried to conceive of internal representations and procedures so as to make them compatible with results of empirical psychology. For example, Johnson-Laird (1983) designed a procedure for interpreting syllogistic premises and finding their logical consequences whose computational implementation exhibited roughly the same performance limitations as human subjects facing the same tasks. However, Marconi (1995) made one of the first attempts at looking for neuroscientific confirmation of hypotheses about lexical semantic competence. He brought back semantic competence with individual words to two separate (though cooperating) abilities: inferential competence, the ability to relate words to other words in material inference, definition, and other intralinguistic performances; and referential competence:

the ability to tell cats from cows by calling the former “cats” and the latter “cows”, to describe a man as running rather than walking, and to pick up the appropriate tool if requested to obey the order “Bring me the hammer, not the pliers!”

Marconi et al. 2013: 2056

Neuropsychological studies appeared to show that the two abilities were dissociated: there were patients who were badly impaired in referential performances such as object naming whereas their inferential abilities were intact; conversely (though less often), other patients exhibited good referential competence with very limited inferential ability. Neuropsychology also showed that within referential competence, application – the ability to find an object (or a picture) corresponding to a given word – was dissociated from naming, the ability to verbally categorize an object or a picture. Later, the distinction was to some extent confirmed by more neuroscientific research, including neuroimaging (see Calzavarini (2017) for an extensive survey).

In the last two decades, research on semantic competence was deeply affected by further neuroscientific research, often based on neuroimaging techniques such as PET and fMRI. Such research showed that understanding of (certain categories of) words correlated with neural activations “corresponding” to the semantic content of the processed words. Thus, e.g., it was shown that listening to sentences that describe actions performed with the mouth, hand, or leg activates the visuomotor circuits which subserve execution and observation of such actions (Tettamanti et al. 2005); that reading words denoting specific actions of the tongue (“lick”), fingers (“pick”), and leg (“kick”) differentially activates areas of the premotor cortex that are active when the corresponding movements are actually performed (Hauk et al. 2004); and that reading odor-related words (“jasmine”, “garlic”, “cinnamon”) differentially activates the
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primary olfactory cortex (Gonzales et al. 2006). Moreover, it was shown that understanding color words (such as “red”) activates areas in the fusiform gyrus that have been associated with color perception (Chao et al. 1999; Simmons et al. 2007; for a survey of results concerning visual activations in language processing, see Martin 2007). Such research originated a neurally based version of internalistic grounding of (lexical) semantic competence, according to which “understanding is imagination” and “imagining is a form of simulation”; moreover, “what you understand of a sentence in a context is the meaning of that sentence in that context” (Gallese & Lakoff 2005: 456). Semantic competence can then be seen as the ability to simulate or re-enact perceptual (including proprioceptive and introspective) and motor experiences of the states of affairs that language describes, by manipulating memory traces of such experiences or fragments of them.

Lawrence Barsalou’s (1999) theory of perceptual symbol systems can be read, in part, as an anticipated theoretical framework for such findings. According to the theory, cognition (including language understanding), though not identical with perception, is based on perceptual experience – including proprioception and introspection – and memory of it. The central claim is that “sensory-motor systems represent not only perceived entities but also conceptualizations of them in their absence” (Barsalou 1999: 589). Perception generates mostly unconscious “neural representations in sensory-motor areas of the brain” (p. 582), which represent schematic components of perceptual experience. Such “perceptual symbols” are not holistic copies of experiences but selections of information isolated by attention (p. 583). Related perceptual symbols are integrated into a simulator that produces limitless simulations of a perceptual component such as red or lift. Simulators are located in long-term memory and play the roles traditionally attributed to concepts (p. 587): they generate inferences and can be combined recursively to implement productivity. A concept is not “a static amodal structure” as in traditional, computationally-orientated cognitive science, but “the ability to simulate a kind of thing perceptually” (p. 604).

As far as language processing is concerned, the theory doesn’t simply claim that mental imaging based on perceptual memory plays a role in understanding (an empirically well supported thesis, see e.g., Paivio (1986)); rather, understanding consists in “the construction of a perceptual simulation to represent the meaning of an utterance or text” (Barsalou 1999: 605). Linguistic symbols (i.e., auditory or visual memories of words) get to be associated with simulators; perceptual recognition of a word activates the relevant simulator, which simulates a referent for the word; syntax provides instructions for building integrated perceptual simulations, which constitute semantic interpretations” (Barsalou 1999: 592). Thus, understanding is a thoroughly internalistic process; semantic competence is the ability to build lato sensu perceptual simulations in working memory. Barsalou grants that contents of perceptual symbols constrain but do not “specify [their] intentionality” (1999: 597), i.e., do not uniquely fix the reference of words; more generally, “the criteria for a simulation providing a satisfactory fit to a perceived entity remain unresolved in this theory” (Barsalou 1999: 609).

This difficulty is related with a more general issue. In traditional philosophical semantics, knowledge of sentential meaning has been identified with knowledge of a sentence’s truth conditions. However, in Barsalou’s theory (as in every simulationist theory) implementation of a sentence’s meaning tends to be more restrictive than its truth conditions. For example, the meaning of the sentence “The cup on Anna’s desk contains pens and pencils” is a simulation in which, by automatic inference, the pens and pencils sit vertically in the cup (Barsalou 1999: 605); however, the sentence would be true even if the pens and pencils lay horizontally on the cup’s bottom. But in a perceptual simulation, they can have one or the other orientation, not both. (This could be called “Berkeley’s problem”, as the philosopher George Berkeley
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(1710) was the first to point out that any mental picture a thinker might associate with the word “triangle” was bound to be inadequate by possessing particular features that were not implied by the word’s meaning.) Barsalou suggests that the difficulty could be overcome by considering that “neurons can code information qualitatively”, e.g. they can code a tiger’s stripes without coding their number (Barsalou 1999: 585); however, simulation as a spontaneous process does not appear to be a priori constrained by truth conditions.

Another difficulty concerns the role of simulators. In Barsalou’s theory, “once a simulator becomes established in memory for a category, it helps identify members of the category on subsequent occasions, and it provides categorical inferences about them” (Barsalou 1999: 587), i.e., it is active in both referential and inferential performances in the sense of Marconi (1995, 1997). Such performances may be impaired if the relevant neural areas are damaged: e.g., if visual areas are damaged then processing of categories specified by visual features (e.g., bird) is disrupted. However, the theory does not account for the well-established case of referential performances being severely impaired while inferential competence is fully preserved, in the absence of any damage to the visual areas (e.g., Kemmerer et al. 2001; review in Calzavarini 2017). Simulators do either both things or neither, which appears to be at odds with the neuro-psychological findings.

Finally, the theory, like all perception-based theories of cognition, has trouble with abstract words and concepts. Barsalou tries to show that, e.g., the content of “truth” can be perceptually implemented by a sequence of perceptual symbols such that the simulation of a propositional content “fits” a perceptually available physical situation, but the attempt is unconvincing.

As should be clear, psychological theories of understanding (and competence) that, like Barsalou’s, are based on notions such as reenactment and “embodiment” are just a recent development of a turn that reflections on semantic competence started taking in the late 1970s. Dummett’s criticism of truth-theoretic semantics and Partee’s acknowledgment of the limitations of Montague’s model theoretic semantics have led to the realization that such theories could not fully account for human understanding of language: genuine understanding must involve more than command of the compositional mechanisms of language (i.e., of how the meaning of complex expressions depends on the meanings of their constituents), and more than knowledge of semantic relations among lexical items as expressed by meaning postulates. That, in turn, invited the conclusion that if (sentential) meaning is identified with truth conditions (as in the tradition of philosophical semantics from Wittgenstein’s Tractatus to Montague and Davidson) and knowledge of truth conditions is what is displayed by the then extant semantics theories, then knowledge of meaning does not amount to semantic competence. At the time, many believed (and some still believe) that the missing ingredient could be provided by Saul Kripke’s and Putnam’s (then) “new” theory of reference: lexical items were “grounded” in the real world by baptisms, causal chains, or simply by the use of language. However, the causal theory’s externalist bent made it unsuitable as a basis for a theory of semantic competence: the essential semantic ingredient, i.e. reference, might not be cognitively accessible to otherwise competent speakers, as with the word “water” on both Earth and Twin Earth before the advent of chemistry. Though Putnam’s “particular ideas and skills” provided content for a regular speaker’s semantic competence, they could not guarantee his or her knowledge of truth conditions.

Meanwhile, debates within (and about) Artificial Intelligence dramatized the role of perception and motor action in the exercise of semantic competence: no artificial device could reasonably be attributed full semantic competence unless it could relate language to the world out there by answering questions, obeying orders, and describing perceptually accessible real-world situations. This inspired Harnad’s, Marconi’s, and others’ attempts to conceive of
semantic competence as involving several perceptual and motor abilities. Later, the relevance of such abilities to language understanding was emphasized by a flow of neuroscientific results that appeared to prove involvement of motor and perceptual brain areas in comprehension, and more generally, in language processing. Such research generated a partly new paradigm, which made language understanding consist in such (modal) activations. Now, there is little doubt that in many cases language production and comprehension are correlated with brain activations which appear to reflect the semantic content of the processed lexical materials: this is confirmed by constantly replicated experimental results. The role of such brain activity in linguistic performances is, however, still an object of controversy. As we saw, the radical claim that language understanding in general just consists in such activations faces some difficulties: e.g., much recent research does not find significant modal activations correlated with understanding of abstract words. Moreover, Berkeley’s problem may indicate that whatever understanding is achieved by way of re-enactment is partial at best. In any case, there is more we need to know for a full-fledged empirical theory of language understanding to get off the ground. For example, what is the place and role of syntactic parsing in understanding? Moreover, what is the role of brain representation of language itself, i.e., of the phonetic, articulatory, visual, and motor representations of words we must somehow possess if we are to explain our ability to perceive language, to speak, to read, and to write? Could such representations – which we know to interact with one another – play the role of pegs onto which several ingredients of both understanding and production are hooked? Answers to such questions must await further research. What seems clear is that no future theory of understanding and semantic competence will be allowed to disregard evidence from psychology and neuroscience.

References

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