

Functionalism

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The functional approach to language holds that the forms of natural languages are created, governed, constrained, acquired, and used in the service of communicative functions. To evaluate this claim, we need to examine both the strengths and the weaknesses of the functional approach.

No one would deny the importance of functions in human language. We constantly use language to communicate intentions between one person and the next. For example, we can use language to tell another person how to drive a car, where to look for edible mushrooms, and how to avoid falling into crevasses when walking over glaciers. We can also use language to foster social solidarity by greeting and acknowledging other people with salutations and standardized phrases. Yet another use of language is to represent our thoughts and goals internally. Both inner speech and external written expression allow us to talk to ourselves in ways that help foster creativity, invention, and memory. Additional artistic functions of language include drama, poetry, and song.

Given the importance of these various functions of human language, it may be surprising to learn that there is a major debate in linguistic and psycholinguistic circles regarding the extent to which functions determine the shape of language. To the outsider, it would seem almost obvious that the shapes and forms of human language are determined by the functions being served. We use nouns to refer to things and verbs to refer to actions. By choosing one word order over another, we distinguish who did what to whom. In this way, the most basic forms of human language are functionally determined. But exactly how does function have its impact on form? Is the impact direct and immediate, or only indirect and delayed? Is there only one basic way in which

functions determine forms, or are there various types of form-function relations? Is it even possible that the system of forms could become freed from linkage to function and take on some type of autonomous existence?

The antithesis to functionalism is formalism. The formalist position holds that, although language may serve a variety of useful functions, the actual shape of linguistic form is determined by abstract categories that have nothing to do with particular functions or meanings. In this view, language is a special gift to the human species, whose formal contours reflect the abstract, reflective, and impractical nature of the human mind. Categories such as “verb” or “subject” are abstract objects that are processed and represented in a separate mental module devoted to grammar. The objects of this module are universal and derive not from functional pressures or ongoing conceptualizations of the world, but from the innate language-making capacity. The language module is informationally encapsulated. This means that it relies only on its own abstract category and rule information to process and represent language; it does not depend upon information from other aspects of cognition. According to this view, the liberation of linguistic form from any tight linkage to function has led to the modular architecture that produces the power inherent in the human mind. Because language is being used inside a separate module in the mind, it is not subjected to the functional pressures of communication.

Functionalists also recognize that language plays an important role in supporting “inner speech”. However, following the lead of Vygotsky, they view this inner speech as social speech that has been captured inside the mind. Although its form is abbreviated and modified in various ways, inner speech still obeys the functional communicative

pressures that operate to shape the social uses of speech. In effect, we serve as our own conversational partner when we use language as a medium for thought.

The core issue on which functionalism and formalism disagree is that of autonomy vs. modularity. Formalists claim that the shape of language is minimally constrained by functional pressures, since language basically follows its own rules in a separate, informationally encapsulated autonomous cognitive module. Functionalists claim that language is continually subject to the need to express conceptual and social messages, and that these pressures govern the processes of language change, language learning, and language processing.

Naive functionalism

A major stumbling block in understanding the extent to which we want to emphasize the functional determination of language has been the existence of a variety of naive functionalist analyses. Formalists find it easy to dismiss these naive analyses as prescientific and empirically flawed. Unfortunately, formalist critiques of functionalism tend to focus exclusively on these naive formulations, while ignoring more complex and powerful versions of functionalism.

Perhaps the oldest naive approach to the relation between form and function is the notion of sound symbolism that we find first expressed by Plato in the Cratylus. Asking why a table has the sound it does in the Greek language, Socrates replies that this sound is inherent in the nature of the thing itself. The problem with Plato's approach to the relation between sound and meaning is that different languages use radically different sounds to name the same object. If the English word "table" had some privileged relation

to the object being named, we would have to conclude that the Spanish word “mesa” and the German word “Tisch” are simply impoverished or degenerate attempts to capture a relation that is best expressed by the English word “table”.

In fact, the relation between a word and its meaning is an excellent example of the limits to functional determination. As the Swiss linguist Ferdinand de Saussure argued at the beginning of this century, the relation between a word and its referent is entirely arbitrary. Saussure elevated this arbitrariness of the linguistic sign to a fundamental principle of psycholinguistic dogma, viewing the word as an association between a phonetic sign and a semantic signification or function. To be sure, some words reflect a bit of phonetic symbolism. Words such as “bump”, “dump”, “thump”, “slump”, and “sump” all express a certain lowering of material. And words such as “bright”, “tight”, “bite”, and “light” all express a high intensity or brightness. Sound symbolism of this type allows us to guess at the meanings of words in a new language with something better than chance accuracy in a simple yes-no judgment task. But these occasional correspondences hardly form the backbone of our understanding of the vocabulary of our language.

Although Saussure was correct in viewing the relation of form to function as arbitrary, his analysis should not be used to dismiss functional determination. On the contrary, Saussure thought of words as mappings between cognitive functions and phonological form. The word for “peach” is used to express ideas about a particular type of fruit, just as the word “however” can be used to express the contrary juxtaposition of two ideas. Each sign stands in a strong indexical relation to the function being signified. Although the word “peach” is not peach-like in itself, its use in sentences is completely

determined by the underlying function that it expresses. In this sense, although language has only very limited iconicity, the mapping relation between the sign and the signified makes language rich in functional expressiveness.

Functionalism in syntax

But does functional expressiveness extend beyond the lexicon? Is there also functional determination for systems such as syntax and morphology? When we look at the forces that govern the order of words in a sentence, we find some obvious candidates for functional determination. One of the most pervasive functional relations was captured in the last century by the linguist Behaghel. According to Behaghel's First Law, words that belong together mentally are placed close together syntactically; conversely, words that appear next to each other in sentences are usually related conceptually. Virtually any sentence can be used to illustrate this effect. Consider a simple sentence such as "All my friends like to eat goat cheese." Here, the word "goat" is not closely related to "friends", but is mentally highly related to "cheese", which is why it appears next to "cheese" and not next to "friends". In a sense, we can think of sentence structure as arising from the compression of a three-dimensional graph structure onto a one-dimensional linear chain. This compression results in a great deal of ambiguity, but the basic impact of conceptual determination is still clearly evident. Languages like Classical Latin that maintain a rich set of inflectional markers manage to transcend Behaghel's law for stylistic effects by separating related words. However, this can only be done when the markings are clear enough to allow the reader to recover the original

relations. Less fully inflected languages like English or even Vulgar Latin are more strictly governed by Behaghel's first law.

Going slightly beyond Behaghel's first law, we can look at the serial order in sentences such as "travel over the bridge and through the forest" as evidence of the way in which sentences tend to map the order of real-life procedures onto the left-to-right order of words in a sentence. This sentence provides us with instructions to first go over the bridge and then through the forest, rather than the reverse. In general, language tends to provide instructions for action by putting first things first. These principles of natural ordering and iconicity represent a certain level of basic functionalism in language that no one would deny. But we cannot push syntactic iconicity too far. Some languages use basic Subject-Verb-Object (SVO) word order, whereas others use Subject-Object-Verb (SOV) or Verb-Subject-Object (VSO) orders. It would be a mistake to think that one of these orders represents the true flow of human thought, since no one of these three common orders dominates in the languages of the world. Although word order has an important iconic expressive function, this function interacts with many other factors in complex and flexible ways.

Another example of a functional grammatical universal is the tendency to mention the topic, or thing we are talking about, before making a comment about that topic. In English, we can topicalize a newly mentioned referent in causal utterances such as "You know Betty's friend, she came all dressed in pink and green." Here "Betty's friend" is being introduced as a new topic. In such forms, we use the initial position of the sentence to introduce the new topic about which we then make an explicit comment. Other languages, like Chinese, Hungarian, or Czech, elevate this ordering of topic before

comment into a fundamental grammatical principle. In these languages, the basic word order of sentences is a direct reflection of the functional value of marking topics and comments. Another linguistic device for marking topics is post-topicalization. Often we begin an utterance without making the topic completely clear and find that we need to tack on a topic statement as an afterthought at the end. An example of this would be a sentence such as “She likes those diamonds, Mary does.”

Functional linguists have explored a wide variety of interesting correlations between form and function. Some examples of functional syntactic relations that have been studied include the grounding of relative clauses on deictic elements such as “that” and “there”, the development of aspectual systems from generalized auxiliary verbs such as “have”, “go”, or “be”, and the evolution of temporal conjunctions from analogous spatial prepositions. Among the most intriguing patterns studied by functionalist grammarians are the patterns that give rise to ergative syntactic and inflectional marking. This fairly exotic alternative to the nominative-accusative form found in Indo-European occurs in languages such as Samoan and Mayan. Ergative syntax arises in a fairly straightforward functional fashion from the fact that people tend to delete subjects when they are well-known and topical. The more that a given participant has been mentioned in a narrative sequence or a conversational exchange, the more likely we are to delete or pronominalize that participant. If we were to take an English sentence like “The boy chased the girl” and delete the subject, we would end up with a fragment like “chased the girl” in which the patient is elevated to the primary unmarked case role. In this way, functional conversational pressures can force a fundamental reorganization of the shape of the grammatical system. It is also interesting to find that many languages that have

developed some form of ergativity have confined use of ergative marking to cases in which the patient is in the third person. These split ergative systems retain nominal marking for first- and second-person subjects, but ergative marking in the third person. Other split ergative systems mark ergativity differentially across tenses and aspects. These complex interactions between ergativity, tense, evidentiality, and person are excellent grist for the mill of functionalist analysis.

The presence of ergative syntax in some languages, and not in others, raises still other important questions that must be addressed. If the functionalist pressures arising from conversation and narration are similar in different cultures, why do languages have such widely varying grammatical systems? Perhaps the formalists are correct in saying that grammar takes on an autonomous life of its own inside the syntactic module, without any direct linkage to functional pressures. The functionalist answer to this is much like the answer to similar questions in biology. One can argue that all species of birds instantiate particular adaptations to the functional pressures of food source, territorial competition, predation, and reproduction. The fact that all species do not look alike does not mean that these functional pressures are not operative in all cases. It simply means that the exact form of the functional pressures varies from one ecological niche to the next. The same must be true of human languages and human cultures. Although all languages are functionally determined, the exact shape of the complex interacting pressures varies in detail from culture to culture.

The Competition Model

Although topicalization and post-topicalization are clearly important functional determiners of syntactic structure, particularly in languages like Chinese or Hungarian, it is not the case that the first noun in an English sentence is always the topic. Often the first noun appears in the position before the verb, not because it is a topic, but because it expresses the role of the agent of the verb. But how can we know in a given case whether the noun is in first position in English because it is expressing the function of agency or because it is expressing the function of topic? This reflects a basic problem in functionalist analysis. If we try to link each form to a single function, we quickly find that we have constructed a type of naive functionalism that fails to reflect the plurifunctionality of grammatical forms. As soon as we try to model the interaction of functions and forms, we soon find that we need to consider radically more complicated types of models.

One model that attempts to deal with multiple functional determination is the Competition Model (MacWhinney & Bates, 1989). Let us look at how the Competition Model analyzes the functional forces that motivate preverbal positioning in English. In active sentences, the agent is the noun before the verb. However, in passive sentences, the agent is expressed by a prepositional phrase with the word “by”. Thus, in an active sentence such as “The man bit the cat”, agency is expressed by preverbal positioning of “man” before “bit”, whereas in a passive such as “The cat was bit by the man”, agency is expressed by placement of “man” after “by”. Why does English provide this alternation? The reason is that sometimes the agent is not the topic. When the agent is identical with the topic, we can use the active form. However, when the patient is the topic, we must

use the passive. If we ask “What happened to the cat?” we must reply that “The cat was hit by the man”, rather than “The man hit the cat.”

One can wire up a network grammar to control the activation of these competing form-function relations. Figure 1 attempts to show how agency and topicality can activate preverbal positioning. However, when the agent is nontopical, a nonlinear combination unit must be activated which then activates the use of the by-clause.

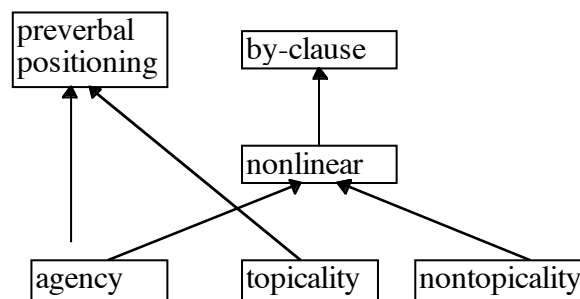


Figure 1: Hand-wired form-function relations for English subject-marking

Figure 1 is a rather clumsy way of expressing the competition between preverbal positioning and the by-clause as alternative ways of mapping agency. The formalism of neural networks provides a better way of understanding this type of nonlinear combination of forms and functions. Figure 2 shows how agency and topicality can combine in a nonlinear way in a neural network through what are called “hidden units” to activate either preverbal positioning or the by-clause or both.

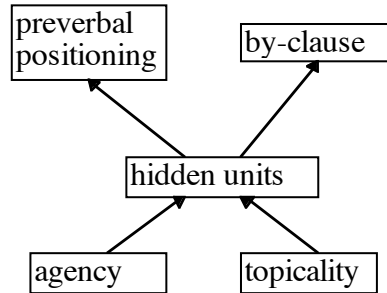


Figure 2: A neural network for form-function relation for English subject-marking

Neural network models of the type shown in Figure 2 differ from hand-wired networks of the type shown in Figure 1 in that that one can formulate a general learning rule for the neural network that can allow a child to learn the system of form-function relations without any hand-wiring of the network. However, a simple neural network of the type shown in Figure 2 has some other limitations. First, this figure only conveys the ways in which functions activate forms during language production. Second, this particular figure only looks at two forms and two functions. A fuller network model of language processing would include many more forms and functions and would provide separate models for comprehension and production. Third, a fuller model would also represent the levels of competition and cooperation between and among forms and functions. In the actual use of language, certain functions tend to cooccur. For example, it is typically the case that the topic is definite and it is also nearly always true that a human is animate. This type of natural coalition between forms has its reflex on the level of forms. For example, in English, the preverbal noun almost always agrees with the verb in person and number. A fuller network model would express all of these additional complexities of the language processing and representation system.

Mapping and the Limited Channel

The Competition Model view of sentence processing tends to emphasize the extent to which our limited information-processing capacities in both production and comprehension force us to channel a rich set of cognitive functions through a very narrow temporal funnel. As we strive to shape our thoughts into meaningful utterances, we are constantly asked to choose between a variety of options, each of which points in a slightly different direction. Should we say “The refrigerator has a pie on top of it” or “There’s a pie on top of the refrigerator”? Our choice of one starting point over another leads us into a further set of grammatical commitments which may turn out, in the end, to be incomplete or unacceptable. Ideally, we would always like to be able to plan out our utterances well before we produce them. But, in the real world of real time processing, we must produce and comprehend utterances in a highly incremental word-by-word fashion. This incremental approach to processing limits the load on our system, but it can also lead to errors and even dead ends.

Grammatical systems have evolved under the functional pressure of actual language use. An important pressure on language is our need to map a large set of cognitive functions onto a small set of competing forms. A general functional principle that all grammars must follow is the principle of “peaceful coexistence”. Because certain functions tend to cooccur, the forms that express these functions also tend to cooccur. Processing can take advantage of these cooccurrences. A good example of a system of peaceful coexistence is the system of subject marking in English. The marking of tense and aspect is another example of a system governed by peaceful coexistence. The opposite side of the coin of peaceful coexistence is the principle of “dividing the

spoils”. Whenever a coalition governed by peaceful coexistence falls apart, it is important to still be able to express the opposing functions. The English passive is an example of a system designed to properly divide the spoils. After the function of topicality has won out in the competition for the form of preverbal positioning, the function of agency has to be satisfied with the “booby prize” of expression through the by-clause. Typically, booby prizes occur later in utterances after the basic functions have already been expressed.

Cue reliability and form reliability

During sentence comprehension, the processor must learn to rely more on some cues or forms than others. The exact identity of the cues or forms that are most reliable varies markedly from language to language. For example, in Hungarian, the direct object of the verb is almost always marked with a final /-t/. Hungarian children learn to depend on the presence of this marker and the absence of any marking on the subject noun as sure cues to sentence interpretation. Because of this, we can say that Hungarian is a strong case-marking language. The actual order of the main constituents of a Hungarian sentence can vary greatly, as long as the presence or absence of the case-marking suffixes is clear. In English, on the other hand, there are no suffixes that reliably mark the subject or the object. Children learning English soon come to realize that the placement of a noun before the verb is a reliable cue to subjecthood. Although Hungarian and English differ radically in the forms they use to mark the subject function, both languages provide the listener with highly reliable cues to subject and object identification.

The counterpart to cue reliability in sentence production is form reliability. When a speaker needs to express a particular function, it is important to be able to rely consistently on a standard form to express that function. For example, we may want to take the point of view of a subject noun that is modified by an indefinite article. However, we tend to prefer sentences with initial nouns that are definite, rather than indefinite. One way around this particular problem is to use the “presentational” construction, such as “There is a pie on the refrigerator.” By using the presentational “there” we can reliably express both indefiniteness and subjecthood at the same time. By increasing fine-tuning of this system of systemic options for production, we can develop increasingly strong control over the maximally expressive use of our language.

Lexical influences on syntax

So far, we have been treating major grammatical categories such as subject, verb, and object as monolithic, unanalyzed units that float free in cognitive space. In fact, the exact ways in which functions and forms compete is heavily linked to the actual identity of the words in the sentence. For example, consider this pair of sentences:

1. (a) Although John frequently jogs, a mile is a long distance for him.
- (b) Although John frequently smokes, a mile is a long distance for him.

Online processing studies have shown that listeners tend to entertain the possibility in 1(a) that “a mile” is the direct object of “jogs”. This occurs because a verb like “jog” can occur in either a transitive or an intransitive frame. A verb like “smoke”, on the other hand, would not take a noun like “a mile” as a complement. In fact, the details of the various lexical expectations between verbs and nouns are quite complex. A strongly

transitive verb like “hit” has a preference for animate subjects but can take either animate or inanimate objects. On the other hand, an action verb like “chase” tends to expect an animate object.

The attachment of prepositional phrases is also governed by fairly specific lexical expectations. Consider this pair of sentences:

- 2 a. The ladies discussed the dogs on the beach.
- b. The ladies discussed the tennis match on the beach.

In 2(a) we can imagine either that the dogs are actually on the beach or, alternatively, that the ladies who are walking on the beach are discussing their dogs who are back home. However, in 2(b) the difficulties involved in conducting a tennis match on a sandy beach tend to preclude the interpretation in which the tennis match is actually occurring on the beach. In these examples, there is competition between attachment of the prepositional phrase “on the beach” to the preceding noun or the verb.

The interaction of verbs, nouns, and prepositions in these systems is governed online by the general features of the words involved. As comprehension of the sentence deepens with time, the specific aspects of the words involved start to come more and more into play. The resolution of syntactic attachments is not different in principle from many other types of grammatical ambiguity resolution. For example, in a phrase like “The container held the apples”, we tend to think about a large basket or box. However, in a phrase such as “The container held the beer”, we tend to think about a bottle or an aluminum can.

These examples, and many others like them, emphasize the extent to which words are forced to adapt their meanings when they combine with other words. We can think of

these patterns of between-word adaptation as involving “pushy polysemy”. The notion of pushy polysemy is much like the notion of ambiguity or homonymy. If we look up common words like “run” or “take” in the dictionary, we will find that they have dozens of alternative meanings, or “readings”. What makes the selection of one of these readings over another a matter of pushy polysemy is the fact that some words tend to push other words into particular polysemic pathways. Consider a phrase such as “another apple”. Here, the word “another” tends to expect a count noun and the word “apple” nicely fulfills that expectation. If, however, we encounter the phrase “another sand”, we have to do significant extra effort to develop an interpretation of the word “sand” that conforms with the mass noun expectation from the “pushy” operator word “another”. One way of making “sand” fit this expectation is to conceptually convert the mass noun into a count noun by packaging the quantity into bags. For example, when we are at the lumber yard ordering sacks of concrete for a construction job, we might well ask for someone to toss “another sand” onto our pickup, meaning by this that they should toss on another bag of sand. Yet another way of fulfilling the expectations deriving from the word “another” is to treat “sand” like a noun derived from a verb. Just as we could say to the masseur at the massage parlor that we would like “another rub”, we could ask the cabinet maker for “another sand” on our newly purchased kitchen cabinets.

Pushy polysemy is only one consequence of the dynamic functioning of groups of lexical items. When we look more generally at the ways in which lexical forms influence syntactic patterns, we see that nearly all syntactic constructions emerge from interactions of lexical items. A good example of this type of syntactic emergence is the double object construction in English. Most verbs of transfer can take either prepositional dative forms

or double object forms. We can say either “John threw the ball to Tim” or “John threw Tim the ball.” However, some verbs that seem to involve transfer cannot take the double object form. For example, we cannot say “Sue recommended the library the book.” By conducting a thorough lexical analysis, we can see that verbs share additional semantic features that help us to understand why some permit the double object construction and others do not. We can think of the emergent properties of these groups as representing “extensional pathways”. Some of these pathways are quite general. For example, we can extend the name of any written work of art to refer to a particular book that contains that work. This allows us to say, “I think I left my Hamlet on top of my Iliad.” Extensional uses of this type are motivated by general principles of lexical function.

Functionalism and Abstract Paradigms

Although many linguists would agree in assigning a major role to communicative function in determining forms such as lexical extensions, word order patterns, syntactic constructions, or case role marking, they would assign a much more peripheral role to functional determination of complex grammatical paradigms. It would be difficult to find an area of language that involves more non-functional arbitrariness than the marking of declensional paradigms in languages like Latin, Russian, or German. As Mark Twain complained in his essay on “The Aweful German Language,” it seems unfair for the German language to decide that the sun (die Sonne) should be feminine and the moon (der Mond) masculine, while relegating a beautiful young girl (das Mädchen) to the neuter gender. However, even in this hotbed of anti-functionalism, we find a rich set of cues or determinants at work to assign nouns to one of the three genders of German.

Some of these cues are semantic in nature. For example, alcoholic beverages are masculine, as are rocks and minerals. But the major determinants of assignment to gender are not semantic but phonological cues. Words ending in -e are typically feminine, whereas words ending in -er or containing umlauts are typically masculine. Using neural network models based on these cues, we can show that the system is a complex, but predictable lattice of interlocking cues.

But why should such complexities exist at all, if the goal of language is to express communicative functions? Although it is true that the gender contrast of German often provides useful cues for grammatical role and sentence interpretation, the same effect could easily be achieved through a simpler gender system. For example, Spanish marks many masculine nouns with -o and many feminine nouns with -a. Spanish achieves the same functional effect using a smaller set of cues than does German. Perhaps we should view the German system as an example of formal determination run amok. However, we need to bear in mind the fact that the linkage of nouns to gender class is bought at a minimal processing cost. Although these systems are difficult for foreigners to learn, they cause very little trouble to German children. What this means is that acquisition of meaningless form classes is a basic part of our language-making capacity, as long as the assignment of words to form classes can be achieved on the basis of superficial features such as phonological structure or minor semantic features. Thus, although grammatical gender is predictable, we would certainly not want to say that it is fully functionally motivated.

How far can we push functionalism?

Much of the evidence supporting the functionalist position derives from studies of language typology or surveys of lexical patterning. This work has repeatedly demonstrated correlations between linguistic form and linguistic function. Given the pervasiveness of these patterns, it is fairly easy to accept the notion that languages evolve in ways that maximize the ability of forms to express communicative functions. But is it possible that the appearance of these form-function correlations in languages is essentially epiphenomenal? Perhaps, as some formalists would argue, language is fundamentally a liberated and autonomous structural engine whose operation occasionally produces form-function correlations as an accidental by-product. Maybe the functional grounding of forms in conversation and narration is something that only a few speakers realize at occasional rare intervals. Just as schoolchildren seldom stop to think about the deeper nature of the pledge of allegiance to the flag, we as speakers may only rarely appreciate the functional determination of linguistic forms. Rather, in our daily language usage, we tend to rely on abstract, functionless, modular syntactic rules whose functional determination is seldom really called into play.

In order to refute this type of formalist claim, a functionalist account needs to look at the processing of functional cues during online sentence processing. This means that the eventual analysis of the claims of functional linguistics rests on the shoulders of psycholinguists. So far, the evidence collected by psycholinguists regarding the use of functions during online processing has been supportive of the functionalist position. The major formalist position in this area has been the modular processing approach developed by workers such as Frazier, Fodor, Clifton, Perfetti, and others. This modular approach assumes that sentence processing depends on computations that occur in a separate

syntactic module that does not rely initially on input from non-syntactic factors. This module implements a highly deterministic process that builds abstract syntactic parse trees without initially paying regard to the meaningful relations between words or the listener's general understanding of the situation. Recent work has shown that the formalist model cannot account for the details of reaction time patterns for the processing of sentences involving alternative syntactic attachments. For example, when we hear a sentence such as "The spy saw the cop with the revolver," we immediately realize that the "revolver" is being held by the "cop" and not by the "spy". In other words, we immediately attach the prepositional phrase to the preceding noun, rather than to the verb. We do this because of our understanding of the meaningful relations between these words, even though this attachment violates the claim modularity and autonomy of the syntactic processor proposed by formalists.

Although there is good evidence that online sentence processing is driven by functional factors, one might still argue that the core of the grammar remains modularly separated from the impact of these functional considerations. One way of maintaining this formalist position would be to claim that the learning of language by the child relies not on functional cues, but on more abstract grammatical principles. For example, one could argue that nature provides an underlying set of biological tools that determine a set of abstract modules that function during language development. This view of language development would tend to emphasize the predetermination of linguistic form through the operation of individual neural structures.

Here, again, the weight of evidence seems to favor the functionalist position. The process of language learning seems to be heavily determined by the exact cue validities

of the language being learned. Children do not come to the language learning task with some abstract set of formal categories to be matched. Instead, they use the input they receive from words embedded in rich situational contexts to guess at the ways in which syntactic constructions map linguistic functions.

The debate between functionalism and formalism is perhaps the single most important issue in linguistics and psycholinguistics. Moreover, this debate has further important consequences for cognitive neuroscience, developmental psychology, philosophy, and artificial intelligence. Given this, a clarification of positions on these issues must be viewed as a top-level agenda item for cognitive science. Although the two camps have stuck closely to their respective positions, researchers are now becoming increasingly aware of the need for an ongoing dialog. Once this dialog has begun in earnest, we will be able to better understand how we can formulate a theoretical perspective that reconciles these two sharply contrasting positions.

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