Parametric Knowledge in Linguistic Structure

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Abstract—The linguistic and conceptual systems exhibit a tight relationship considering that words are access sites to conceptual structure. However, linguistic and conceptual structures seem to combine into a sort of homogeneous system which makes the distinction between them fuzzy. The article explores the possibility of positing a type of schematic linguistic content that is unique to the linguistic system. This linguistic content comes in the form of lexical concepts and linguistic parameters. These notions will shed some light on the parametric linguistic knowledge that might be encoded in and externalized via language. This in turn, could be the feature about language that differentiates it from the closely related conceptual system.

Keywords—Conceptual parameters, conceptual structure, linguistic parameters, lexical concepts.

I. INTRODUCTION

ADVANCES in the cognitive sciences have provided important insights into the relationship between the conceptual and linguistic systems (e.g., [1]-[8]). However, this relationship gets to the point that these systems are difficult to differentiate. Following Langacker [9], [10], words offer access points to conceptual structure, which is non-linguistic knowledge that populates the human conceptual system. Words, in turn, are symbolic units that are constituted by a semantic pole, a phonological pole, and the relationship that holds between them. However, the access sites of words vary in *conceptual amplitude*. Talmy [11] has argued that functional or closed-class words – such as prepositions and particles – offer a *narrow* access to conceptual structure, while open-class words (such as nouns and verbs) offer a *broader* access to it. This is due to the rich content that these types of words – traditionally referred to as content words – evoke. But is there anything else about the linguistic system apart from *access*, that makes it unique and more distinguishable from the older (in evolutionary terms) conceptual system? The answer might be yes. To approach this question, the paper revises key theoretical constructs such as lexical concepts and semantic parameters to eventually offer an alternative view on what might be unique to the linguistic system.

II. LEXICAL CONCEPTS

The construct of lexical concepts that is used in this article is taken from the work of [3], [4]. According to [3], [4], lexical concepts are units of mental grammar that populate the linguistic system. They sanction instances of language use and have bipartite organization: on the one hand they encode linguistic knowledge, and on the other hand they facilitate

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access to conceptual structure. However, not all lexical concepts, according to [3], [4], offer access sites to conceptual structure, but only those associated with open-class items. That view is at odds with the present account in which lexical concepts, no matter their grammatical category, offer access sites to conceptual structure, which crucially, *varies* in amplitude. The type of conceptual knowledge that is offered by open-class lexical concepts such as [HOSPITAL] is related to the notions of frames [12] and cognitive models [3: Ch. 10]. These are rich bodies of non-linguistic knowledge that are interconnected in a sort of semantic network. On the other hand, lexical concepts that are associated with closed-class items offer access sites to a more schematic type of conceptual structure. This type of knowledge, in turn, can be formalized as *conceptual parameters*. A conceptual parameter tries to capture the schematic information that is usually accessed via closed-class items. For instance, consider the English preposition *on*. A parameter like [CONTACT] is what possibly sanctions instances of language use like *There is a fly on the wall*. Contact is clearly a phenomenological parameter that is conveyed by *on*. This means that the complexity of experience (i.e. interactions in space) that is reflected in mundane things such as [CONTACT], [CONTAINMENT], [SUPPORT], among others, get parameterized through abstractions of recurrent patterns and structures in phenomenological experience. These humanly relevant interactions in space are known as *proto-scenes* [13] and might constitute the bedrock of word meaning.

The notion of conceptual parameter, in turn, is akin to *image schemas*, a construct originally formulated in 1987 [14]. Image schemas are schematic spatial representations that are acquired before the onset of language. They constitute the foundations of the human conceptual system. Thus, they are perfectly compatible with conceptual parameters in that they represent the form that the schematic structure takes within the conceptual system.

III. LINGUISTIC PARAMETERS

As briefly pointed out in Section II, lexical concepts – bundles of schematic knowledge, including parameters that populate the linguistic system and hence are units of mental grammar – have bipartite organization in that they encode linguistic content and facilitate access to conceptual structure that varies in richness. Now the exact nature of the linguistic content of lexical concepts can be approached using [9]'s notion of profile. A profile must be understood as the *designatum* of the scope of a predication. It follows that symbolic units (i.e. words) profile either a relation or a thing. Things are profiled by simple nouns like *toy*, and nominal structures such as *the toy*. The profile evoked in simple nouns

and nominals is apprehended as being conceptually autonomous, compared to the dependent character of all the rest of the grammatical categories such as verbs, adjectives, and prepositions, which profile a *relation*. This in turn, is what [9] refers to as A/D (autonomous/dependent) alignment: a feature of language design in which conceptually autonomous structures elaborate more dependent ones. For example, in an utterance such as *The glass is on the table*, we have as main attentional figure – the trajector in [9]'s terms – the nominal profile of *the glass*, while the second most salient entity is the landmark, which is represented by the nominal profile of *the table*. These autonomous structures are what elaborate the more dependent structures, in this case the copular verb *is* and the preposition *on*.

We can observe, then, how the notion of profile can help us to identify at least two linguistic parameters which can be glossed as [THING] and [RELATION]. A *linguistic parameter*, in turn, can be understood as a highly schematic unit of linguistic knowledge that is conveyed in linguistic structure. A linguistic parameter is akin to a lexical concept, but it captures the most schematic aspect of its linguistic knowledge. Thus, this notion represents the form that the linguistic content encoded by a lexical concept takes. We can also appreciate how lexical concepts and linguistic parameters combine themselves to form more complex symbolic assemblies, as demonstrated by [15] in a work on ditransitive constructions. Consider the following example:

(1) Mike baked Lucy a cake   [INTENDED TRANSFER]

The schematic and purely linguistic content that might work at the most schematic level of organization in (1) can be glossed as [X INTENDS Y TO RECEIVE Z] and it is the result of lexical concept integration. In cognitive grammar, syntax is not an isolated meaningless module, but is incorporated in the semantic pole of a symbolic unit, and hence, it is meaningful. Indeed, we can observe how lexical concepts exhibit semantic tendencies that guide processes such as lexical concept selection, integration, and interpretation (For details on these processes see [3: 217-252].)

IV. PARAMETRIC KNOWLEDGE IN THE LINGUISTIC SYSTEM

As we have seen so far, lexical concepts and linguistic parameters are tightly linked to each other. This in turn, is due to linguistic parameters trying to capture the form that linguistic content takes when is encoded by open and closed-class lexical concepts. Thus, linguistic parameters represent the decontextualization (in the sense of [9], [10]) of symbolic units: a highly schematic level of lexical representation that emerges from language use. Linguistic parameters are usage-based. Note that decontextualization is akin to *linguistic parameterization*, which has to do with the abstractions of recurrent patterns and structures of linguistic events. This in turn, differentiates this notion from *conceptual parameterization* (even though it also involves decontextualization). This latter term deals with the structuring of the meaning potential (in the sense of [1]) of a closed-class item, in which phenomenological experience plays a substantial role, as briefly showed for the case of the

preposition *on* that encodes the Contact and Support parameters depending on the linguistic context it is placed in. As pointed out earlier, in a sentence such as *There is a fly on the wall*, the parameter that is most directly involved is Contact. On the other hand, in a sentence such as *The glass is on the table*, not only is Contact directly involved, but also Support since the table must be resistant enough to support the weight of the glass. Hence, both parameters get activated. Different conceptual activation is due to different lexical concept integration. Following [1], when a word is put in context is when we can appreciate its *meaning determination*. On the other hand, if we think of a word in isolation, we can speak of *lexical representation* – that is, the meaning potential of words that must be stored in long-term semantic memory.

According to [3: 112-113], parameterization consists of a highly reductive form of abstraction. Parameters compress the fine distinctions of phenomenological experience into much broader general distinctions. For example, English speakers employ different temporal concepts to locate themselves with respect to time, some of these are *this moment*, *now*, *this second*, *this period*, *1 second ago*, *the day before yesterday*, among others. These temporal expressions evoke any manner of temporal distinctions we might care to make. However, parameterization "strips away" – so to speak – most of the fine distinctions that are apparent in the original experience, reducing it to a highly limited number of parameters. Indeed, parameters are thought of as constituting a limited set (like image schemas) because they reduce the complexity of experience into more general categories for linguistically mediated communication. Thus, parameters are part of the bundle of information that a lexical concept serves to encode. Consider the following examples:

(2) a. He play*ed* the guitar   [PAST]
    b. He play*s* the guitar   [PRESENT]

As shown in (2), the many fine distinctions that can be made using temporal reference can be divided into a small set by virtue of parameters. Such parameters might distinguish between the Past and Non- past or Present. This is indeed the basis of the tense system in English. The English language encodes just two parameters, it manifests a binary distinction. In other languages such as French, there are three linguistic temporal parameters which are Past, Present, and Future. In other languages such as Bamilike-Dschang, an African language, temporal parameters can reach up to eleven distinctions, among them Remote Past and Recent Past.

We can appreciate that parameters are encoded by specific lexical concepts and thus form part of the bundle of knowledge that constitutes them. For instance, the parameter of Past is associated with the past-tense inflection *-ed* in (2a). However, this parameter is also associated with other forms such as *went*, *lost*, *sang*, among many others. It follows from this that lexical concepts can be associated with different vehicle types.

According to [3] and [4], a key feature of linguistic, as opposed to conceptual content, is that it encodes knowledge in parametric fashion. However, because [3], [4] claims that closed-class vehicles do not offer access sites to conceptual

structure, is that they are supposed to encode purely linguistic information. But how is it so? Recall that the present article takes a nuanced approach on this issue by assuming that *all* lexical concepts offer access sites to conceptual structure, which crucially, varies in terms of amplitude: *broad* conceptual access is offered by open-class items, namely nouns, adjectives, and verbs. This in turn, explains why these grammatical categories are associated with frames and cognitive models in the first place. On the other hand, a *narrower* conceptual access is offered by closed-class items. Such a narrow access is reflected in the form of conceptual parameters: schematic conceptual knowledge that is part and parcel of our human conceptual system. From this it follows that parameterization might work at two levels. At the most schematic level we can speak of linguistic parameterization, whereas at a less (but still) schematic level, we can speak of conceptual parameterization. This is the issue we now turn.

V. PARAMETERIZATION AT TWO LEVELS

The claim that closed-class items do not offer access to conceptual structure has been challenged in [6] by proposing a conceptual basis for the prepositional vehicle *between*. A *conceptual basis* [6] (see also [5]) is the semantic potential from which words are elaborated and extended (in the sense of [9]). Elaboration and extension, in turn, must be understood as forming a continuum. The former deals with full schematicity and is a type of adjustment in the level of specificity that characterizes a given structure, whereas the latter has to do with partial schematicity (For details see [9: 66-76].) The construct of conceptual basis allows us to capture the lexical representation level of words. That is, their status in the mental *lexico-grammatical* system (using [16]'s term). It also allows us to appreciate their meaning determination – their contextual realization in an utterance. Consider the conceptual basis proposed for *between* in [6: 110]:
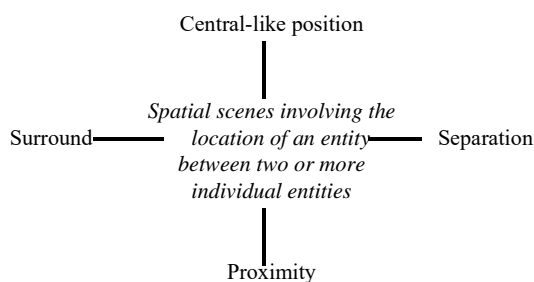

Fig. 1. Conceptual basis for *between*

In the center of the conceptual basis (in italics), we can see the proto-scene of the preposition *between*. Recall that proto-scenes are humanly relevant interactions in space where abstractions of recurrent patterns and structures take place. Proto-scenes facilitate parameterization. However, there is the necessity to posit two levels of parameterization due to closed-class items providing access points to schematic conceptual structure, as opposed to [3]'s approach. Indeed, the type of conceptual structure that is evoked by closed-class items such

as prepositions, can be modelled in terms of conceptual parameters. The parameters that, at the very least, should constitute the conceptual basis of *between* are Surround, Separation, Central-like position, and Proximity. Surround and Separation are conceptual parameters that are encoded by some prepositional-landmark elements, as in an utterance such as *The flowerpot is between the radio, the TV, and my laptop*, where we can observe how the profile of the coordinate structure of the *and*-type, here *the radio, the TV, and my laptop*, elaborates the prepositional landmark to locate the figure, here *the flowerpot*. Central-like position is a parameter that is exhibited by the attentional figure. In this case, the flowerpot adopts a central-like position due to its location with respect to its landmark. Finally, proximity is another phenomenological feature of the trajector/landmark alignment evoked in the utterance just given. Crucially, however, conceptual parameters get activated differently depending on the linguistic context that a closed-class item such as *between* is put in (for details on this issue see [5] and [6].)

Now the point here is that once we assume that closed-class items offer access sites to (schematic) conceptual structure, then the process of parameterization is not seen as linguistic exclusively. Recall that semantic parameters might be divided into linguistic and conceptual. Thus, parameterization can fall on such a division as well. The complexity of experience may not solely be compressed for linguistic content, but also for highly schematic conceptual material like the one facilitated by prepositions, particles, conjunctions, and all the rest of the closed-class items. This type of parameterization is referred to here as *conceptual* and is the one in charge of constituting the conceptual basis of a closed-class item. On the other hand, linguistic parameters are evoked in language exclusively. In the case of the preposition *between*, the linguistic parameter that underlies its highly schematic semantics might be glossed as [RELATION]. The parameterization process of this type of highly schematic linguistic knowledge can be termed *linguistic* and is a usage-based process in which abstractions of recurrent linguistic patterns and structures take place.

Even though both types of parameterizations are based on experience (so both involve decontextualization), linguistic parameterization deals with the grammar of a specific language, through usage, while conceptual parameterization has to do with more phenomenology-based concepts that mainly come from situated action and perceptual experience.

In sum, the perspective adopted here intends to shed some light on what might be unique to language. Parametric knowledge seems to comply with the enough characteristics to be considered inherently linguistic. However, parametric knowledge also encodes schematic conceptual structure which is modelled in terms of conceptual parameters: schematic building blocks that emerge as a result of perceptual and situated experience in space. They constitute the conceptual basis of all closed-class items, as in the case showed for *between*. As mentioned earlier, the strict, almost traditional view of a dichotomy between content and functional words adopted by [3], [4], forces us to alternatively conceive two levels of parameterization. It follows that linguistic and

conceptual parameters may represent the inherent linguistic content of the linguistic system, and the schematic conceptual structure that is part and parcel of our human conceptual system, respectively.

Following Barsalou [17], all concepts are simulators. Simulators are schematic memories of perceived events that allow us to produce simulations that are always partial and sketchy, never complete. The notion of embodied simulation, on the other hand, should be understood as the creation of mental experiences about perception and action in the absence of their manifestations. The embodied simulation theory (e.g., [18]) states that we use the same parts of the brain that are dedicated to interacting with the world for different cognitive operations such as imagery, recall, and language comprehension. From this it follows that linguistic symbols develop together with their associated perceptual symbol. For [17], linguistic symbols resemble perceptual symbols in that they also are schematic memories of perceived events. They develop in similar fashion. Hence, there are simulators for words that become linked to simulators for entire entities or events, which can be further linked to subregions and specializations. Yet there are also linguistic simulators that become associated with other aspects of simulations [17: 592], these include properties (e.g., *red*), manners (e.g., *clumsily*), relations (e.g., *between*), and so forth. This evidence from cognitive psychology supports the idea that *all* lexical concepts offer access to conceptual structure that may vary in richness, while at the same time they encode purely linguistic content in parametric fashion.

VI. Conclusions

The present article has attempted to explore on what is unique to the linguistic system that differentiates it from the ancient conceptual system. To do so, the article offered an approach to language and cognition based on semantic parameters and frames. Frames and cognitive models are generally associated with open-class items (conceptual parameters also underlie the structuring of open-class items, but they are not as prominent as frames and cognitive models). Semantic parameters must be understood as consisting of two types: linguistic and conceptual. The former type deals exclusively with highly schematic linguistic content that is evoked in linguistic structure, while the latter tries to model the form that the schematic conceptual material takes in the semantics underlying closed-class items. Further research is desirable to approach a more solid theoretical account to corroborate, with experimental methods, the psychological reality of these two types of parametric knowledge that characterize the linguistic content of all lexical concepts, and the schematic conceptual structure that closed-class lexical concepts facilitate access to.

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