★ FORUM ★

The Present of UG

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Universal Grammar (UG) has been one of the core ideas of generative grammar since its inception. Obviously, the idea of a UG is not an innovation of generative grammar; in fact, it has long roots in the Western philosophical tradition that extend to the High Middle Ages (cf. Eco 1993, Covington 2009). However, there is no doubt that UG has experienced a new vindication and popularity since the outset of generative grammar and the focus that generative grammar put on descriptive and explanatory adequacy (cf. Chomsky 1965, 1966). UG is the key component that explains at the same time both the linguistic universals (the constrained variability observable among natural languages), and the path of language acquisition in infants. Over the last decades, there has been a substantive amount of research and advancement in the exploration of the nature of UG, its nature and species specificity. This type of research has been conducted from very different grounds: comparative linguistics and parametric linguistic variation (see, among many others, the works of Borer 1984, Baker 1996, 2005, Rizzi 2000, or Boeckx 2011), natural language acquisition and the Language Acquisition Device (cf., *inter alia*, Hornstein & Lightfoot 1981, Crain & Pietroski 2001, Yang 2003, Hale & Reiss 2003, or the general overview in Ayoun 2003), linguistic diachrony and change (cf. Lightfoot 1993, Niyogi 2006, Roberts 2007), and artificial language learning in humans (cf. works like Smith & Tsimpli 1995, Musso *et al*. 2003) and non-humans (cf. Premack 1980 and the debate in Piattelli-Palmarini 1980, Wallman 1992 for a critical review, and Hauser *et al*. 2002 for an important contribution demarcating the nature of UG).

In fact, one of the virtues of this general approach is that UG is sought as the unique *explanans* for the *explananda* of parametric variation, language change and language acquisition; the three are different faces of the same problem: How does the child get from its initial state to a steady state of linguistic knowledge? Language change is intimately related the acquisition process, which is mediated by the Language Acquisition Device (i.e. UG), which constrains the parametric options available for natural languages. However, UG is still a disputed notion, and scholars of different orientations argue that we could (and should) dispense with it; see, for instance, Elman *et al*. (2006), the Boden–Chomsky discussion (Boden 2006, Chomsky 2007, Boden 2007), or the recent critique of linguistic nativism in Clark & Lappin (2011).

Many of these topics were discussed at the conference entitled *The Past and*

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Future of UG (15–18 December 2011), wonderfully organized by Wolfram Hinzen, Alex Drummond, Uli Reichard, and Michelle Sheehan from the Department of Philosophy at Durham University with the financial support of the British Academy (grant CS110386), the AHRC & DFG (grant AH/H50009X/1) and Oxford University Press, in which I had the great fortune to participate. As said in the conference booklet, the main goal of this conference was to create "an international, interdisciplinary forum for assessing and re-directing research on Universal Grammar and the biological foundations of language, bringing together linguists, psychologists, philosophers, and biologists". I have to stress that the conference was very well equipped to approach that goal, for it counted with the participation of very prominent scholars, specialists in a wide variety of topics that ranged from analytic philosophy to neuro-imaging, from psychiatry to paleontology, and, of course, different areas of linguistics.

The gathering started with Oxford psychiatrist **Tim J. Crow**'s public lecture. Crow provided an overview, and a personal view, on the speciation of *Homo sapiens*. His contribution had two clearly separated parts; the first half devoted to a review of the place of mind in the accounts of the evolution of *Homo sapiens*, the second part dealing with the relationship between brain lateralization, mental health, and language. His main point was to reveal that since the outset of evolutionary biology, the evolution of human mind has been seen as a major problem, to the point that Darwin himself left it for the future (Darwin 1859). In fact, A.R. Wallace, already in 1864, notes that even if there is no big morphological difference between men and apes, there is an enormous difference in their mental life, language being the apex of this difference. The human mind "enables him with an unchanged body still to keep in harmony with a changing universe" (Wallace, 1864: clxiii). Crow discussed the asymmetric anatomy of the brain suggesting that the hemispheric differences arise from a so-called 'balloon model' of cortical development (cf. Harasty *et al*. 2003). According to him, the development of the four chamber structure of the brain (maybe due to the ProtocadherinXY gene pair some 160 KYA) would be a crucial step towards the development of the capacity for language (see also Crow 2002, 2008). This brief talk provided a nice ground for the outset of the conference, given that it touched a wide range of topics that would be matter of discussion the next couple of days.

December 16th started with the discussion of the past of UG. **Wolfram Hinzen** (Durham University) set the stage with a brief presentation of three pre-Chomskyan traditions of Universal Grammar: (i) the Indian classical tradition, (ii) the medieval modistae, and (iii) the Port Royal rationalists of the 17th century. These three traditions entail three completely different visions of the nature of language and linguistics (see e.g. Covington 2009, Mukherji 2010, and Hinzen *et al*. 2011). In this introductory presentation, Hinzen compared the main themes and particular visions of each of these traditions, thus providing a nice framing for the next talk, by **Elisabeth Leiss** (University of Munich). There she explained the vision that medieval modists had of language as a technique to transform reality into mental representations, not as a means to communicate with the external world. Hence, according to the modists, the nature of these mental representations is linguistic in essence. Leiss also stressed that in this process of conceptualization, part-whole relations play a crucial role, and she explained the

modists's conception of non-nominalistic mereology, a very sophisticated theory of part-whole relations in lexical semantics and grammar which contrasts sharply with the type of set-theoretic mereology that contemporary linguists and philosophers employ. In my view, too little is known on the work of these grammarians (to the point that a large amount of manuscripts are yet to be analyzed and published), and it was very welcome to have both Hinzen's and Leiss's presentations in a conference on the nature of UG. Knowledge of the older traditions should not be relegated to conferences and textbooks on the history of linguistics, for some of the paths that we might want to construe might have been already crossed by others.[1]

After these talks on the 'Past of UG', the rest of the conference centered on particular visions of contemporary defendants and skeptics of UG. I would like to highlight that this is a remarkable thing; very different views were expressed (even radically opposed ones) and the debate and the exchange of ideas became rich and fluid. What follows is a sort of summary of the talks and their commentaries.

The next talk was delivered by **Ian Roberts** (University of Cambridge) and **Anders Holmberg** (Newcastle University). They presented what in my view is one of the most attractive and promising approaches to linguistic variation. The outset was to argue that the simplest idea (and one in line with common assumptions elsewhere in the cognitive sciences) was to take it as granted that there is a universal set of cognitive capacities underlying human linguistic compretence. Regarding linguistic variation, they proposed a hierarchy of syntactic parameters and default values to account for the (macro- and micro-) parametric variation on word order and its emergence *qua* acquisition (language learners will posit default options in the absence of Primary Linguistic Data that would force them to go into marked options (because of 'input generalization')). Therefore, Roberts & Holmberg's proposal is that an important amount of linguistic variation takes place in narrow syntax and does not have to be restricted to externalization like, for instance, in the crosslinguistic variation observed in the patterns of answers to YES/NO questions. Roberts & Holmberg's presentation was followed by a commentary by **George Walkden** (University of Cambridge) where he clarified the notion of linguistic parameter and the factors that are involved in the shape of the acquired language. He proposed that, ideally, parameter hierarchies of the sort advocated by Holmberg & Roberts should be motivated in terms of 'natural law' (the 'fourth factor'; cf. Berwick *et al*. 2011).

Quite in contrast with these two was **Ewa Dąbrowska**'s (Northumbria University) talk. Dąbrowska's presentation questioned the reality itself of UG, arguing that, among its defenders, there is no consensus on the very notion of UG, and that the arguments that have been posited in its favor are unconvincing. Among other things, she questioned the notions of species specificity, poverty of stimulus, ease of acquisition, and uniformity of the knowledge of language across the population, arguing that they are either empirically unsupported or that they can have alternative explanations. She also advocated cognitive–constructional

[1] This is also the case of rationalist gramarians like F. Sanctius Brocensis (1523–1600), precursor of Port Royal grammarians, but whose work is now largely understudied and unknown.

grammar as an alternative to minimalism (cf. Dąbrowska 2004, Goldberg 2006). As the reader might know, the type of criticism made by Dąbrowska conforms to one of the sides in a longstanding discussion in linguistics, and one that stands at the core of our scientific agenda (cf. e.g. Piattelli-Palmarini 1980, or the recent discussion in Pullum 2011 and Brenchley & Lobina 2011, after Chomsky 2011). Unfortunately, due to some technical problems with the video-conference, we were not able to listen to the comments that **Theresa Biberauer** (University of Cambridge) had prepared to Dąbrowska's presentation. At any rate, the discussion session after Dąbrowska's presentation turned out to be a very lively one.

After the discussion on the existence of UG, where each one, I believe, stayed in his/her previous position, paleontologist and systematist **Ian Tattersall** (American Museum of Natural History) provided an illuminating lecture on the speciation of *Homo sapiens* where he sketched out a general framework within which UG and language may have been acquired, particularly addressing the questions of *how* and *when* they were acquired. After an overview of the cognitive capacities and archaeological record left by each of the main branches within the genus Homo,[2] Tattersall concluded that the archaeological record strongly suggests that there is a sharp distinction between *Homo sapiens* and all the rest of the hominids in terms of mental life (as attested in tool-making, symbolic behavior, etc). What is more, even the earliest humans who looked exactly like us (from around 160,000 years ago) behaved pretty much like the cognitively less sophisticated Neanderthals. From all this he concludes that the mechanisms underwriting UG had to be acquired very recently, in an evolutionary instant, and in the context of emergence, rather than as a predictable extrapolation of pre-existing long-term hominin trends driven by natural selection. In his commentary to Tattersall's talk, **Martin Everaert** (Utrecht University) started with a piece of skepticism and stating that we should not tell stories about possible origins of language, and highlighting the need for evidence. In this regard, he argued that the meaning of the term 'symbolic', when used for 'symbolic species' and 'symbolic behavior', is not very well defined and he further questioned whether a 'symbolic' capacity is necessary for the development of language but just not enough. The discussion continued with interesting interchanges between Ian Tattersall and Noel Burton-Roberts on symbolic thoughts and Ian Tattersall and Hagit Borer on the differences in the nature and function of burials in Neanderthals and humans.

The next contribution was **Nick Chater**'s (Warwick Business School), who presented the main conclusions of the work he has been developing lately with Morten Christensen, Florencia Realli, Andrea Baronchelli, and Romualdo Pastor-Satorras. The main argument of his talk was summarized in the title: "Language is shaped by the brain; but not the reverse", thus his position was that human language is built on cognitive and biological foundations that pre-date the emergence of language. Upon his view, language evolution is primarily cultural evolution; language evolves to be easy to learn and process by the language learners/speakers. As a consequence, modern languages are better shaped for communi-

[2] To the interested reader I would recommend Tattersall (2008), which provides a very approachable introduction to the evolutionary path that led to the origin of our species.

cation than ancient languages (see Chater *et al*. 2009 on the Baldwin Effect). Chater's talk was followed by a commentary by **Scott Thomas** where he clarified and extended some of the points made by Chater. As can be imagined, Chater's proposal generated a high amount of controversy during the question period.

Next came **Maggie Tallerman**'s (Newcastle University) presentation, in which she put forth an adaptationist view of the evolution of human language from a pre-syntactic protolanguage. She argued that contrary to a widely accepted view in minimalism, there is no evidence in support of a recent saltational emergence of language and that, rather, syntax evolved gradually from various previous stages of protolanguage. According to her, in the evolution of language, use and externalization played a primary role, where the creation of the lexicon and syntactic rules and operations like displacement were driven by language use (i.e. for communication). This communicative goal would be, for instance, in the origin of topicalization, which would be a means of highlighting the relevant information by presenting it first in the sentence. **Joana Rosselló** (University of Barcelona) was the commentator of this talk and she argued that Tallerman's talk suffered from a number of serious flaws. Among other things, Rosselló criticized the use of the notion of externalization on the grounds that it is not a coherent concept in a functionalist approach and that externalization necessarily implies a previous internal/mental representation. Another point of her criticism was Tallerman's proposal that displacement evolved for communication. Rosselló pointed out that displacement is not necessary, or not necessarily overt (like in *wh-in situ* languages), and that it may not always be leftward (like in *wh*-questions in sign languages, cross-linguistically).

The program of the first day ended with a public lecture by **Tom Roeper** (University of Massachusetts, Amherst) where he presented in a non-technical way some of the ideas and arguments that he would develop the next day in his conference talk.

The morning session of December 17th, which was dedicated to neuroimaging studies of language and language-like cognitive capacities in humans and non-human animals, gives a nice picture of the interdisciplinarity of the conference. This session was inaugurated by **Christopher Petkov** (Newcastle University), who started with an overview of the issues and challenges inherent to the comparative study of linguistic and pattern learning. He discussed the research and experiments that he and colleagues are developing in order to assess the question of whether primates like macaques or marmosets are able to learn strings generated with different sorts of artificial grammars and if so, which brain regions support that learning. After reviewing some of their current behavioral and fMRI experiments, he argued that we can establish a link between the language-processing brain areas in humans and some homologous regions in nonhuman primates. Thus, upon his view, we can talk of a precursor system for core aspects of syntax in nonhuman primates and hence, those aspects of our syntactic capacities would not be species specific.

This presentation was followed by a critical comment by **Jeffrey Watumull** (University of Cambridge/MIT). Watumull's point was that the type of work that Petkov and colleagues are developing fails to address the difference between

'strong generativity' and 'weak generativity'.[3] He pointed out that this type of expediment can only assess weak generativity (the generation of certain strings) but not strong generativity (the assignation of unambiguous structural descriptions to those strings), thus, they can tell us very little as to the type of grammar that generated them. Upon his view, until the Chomsky hierarchy is revamped from weak generation to strong generation, artificial grammar experiments based on it must be adjudged dubious (see, among others, Samuels, Hauser & Boeckx to appear for discussion).

Next was **Nathalie Tzourio-Mazoyer**'s (University of Bordeaux Segalen — GIN) talk. She commented on a meta-analysis based on 129 imaging articles concerning phonological, semantic and sentence-text processing tasks that provide a description of the left hemisphere phonological, semantic and syntactic regions (cf. Vigneau *et al*. 2006, 2011). She argued that their studies show that besides the strong left hemispheric dominance for language, there is also a great difference in the inter-hemispheric interactions: While left hemispheric peaks are in majority unilateral, a reversed pattern can be observed in the right hemisphere. This strongly suggests that while the left hemisphere works predominantly in an intra-hemispheric manner, the right hemisphere activity is mainly based in inter-hemispheric interactions. She also commented on the relationship between right-handedness and hemispheric specialization and, after providing an overview of the variability observable in hemispheric specialization, she questioned the existence of factors other than handedness that may be at play in setting this specialization.

The commentary to her talk was delivered by **Kai Alter** (Newcastle University). He framed Tzourio-Mazoyer's talk in a discussion of his recent work on how visual information is integrated together with auditory information during the complex task of processing emotional information like laughter (joy and taunt). He argued that this research shows the involvement of the dorsolateral prefrontal cortex (DLPFC) bilaterally, as well as the anterior rostral mediofrontal cortex (arMFC), just as in a wider range of cognitive functions such as the parsing of prosody, information evaluation, etc. These findings, then, demand for a more integrative model.

The next presentation was provided by **Gavin Clowry** (Newcastle University) who centered on human specific aspects of cerebral cortex development. He provided a detailed discussion of some of the issues that arise when using mice brains as models for human brains, arguing that cortical expansion in primates is not just quantitative, but rather, that there are some novel cortical areas which are identified by their gene expression, connectivity and functions and which are not present in rodents. One major difference is that a significant amount of human cortical neurogenesis takes place in the outer subventricular zone (an area which is significantly smaller in rodents). Related to this, he argued that the recently discovered inhibitory interneurons play a crucial role in cognitive processing, fine-tuning the oscillations in neural activity in distributed networks that underlie learning and memory. In humans, as in other primates, these interneurons are generated intracortically, but in rodents 95% of these cortical inhibitory inter-

[3] See also Brenchley & Lobina (2011) for a similar discussion in their answer to Pullum (2011).

neuros are generated outside the cortex, at the ganglionic eminences, and they migrate to the cortex during development. Another main difference that he discussed is brain asymmetry and lateralization, which play a crucial role in human brain development. This talk was followed by an illuminating commentary by **Tim Crow** (Oxford University) where he brought into discussion his own research on the nature of the brain torque (a bias across the antero-posterior axis whereby the dorsolateral prefrontal cortex on the right hemisphere is thinner and wider than that on the left side, and the occipito-parieto-temporal cortex is thinner and wider on the left than the right). He argued that the human brain has four quadrants of association cortex left and right motor, and right and left sensory which distinguishes it from that of all other mammals. In this regard, he vindicated the relevance of the study of schizophrenia for the research on the evolution of lateralization and language, given that in this pathology we can observe instances where the deictic frame (i.e. the distinction between compartments) breaks down (see e.g. Crow 2010 for discussion).

The presentation by **Wolfram Hinzen** (Durham University) provided an innovative analysis of what UG is and of the nature of language itself. He argued against one of the core assumptions of the computational theory of mind; the idea of the availability of a grammar-independent Language of Thought that builds representations upon computations on symbolic objects (see Fodor 1975, 2008, Fodor & Pylyshyn 1988). After discussing some evidence against the postulation of a propositional Language of Thought in nonlinguistic animals (see also Terrace 2005, Penn *et al*. 2008), Hinzen went on to explore the idea that there is a causal connection between language and a human-specific format of thought which is referential and propositional, and which appears to be very recent in evolutionary terms. He framed his discussion within the research that he has been developing over the last years on the nature of semantics and the function of Merge and the phase-structure of syntax: non-recursive predication relations arise biphasally, generating formal-ontological distinctions such as 'object', 'event', and 'proposition' (see also Sheehan & Hinzen (2011) for a detailed exposition of this idea). In a nutshell, with the system depicted by Hinzen, the basic ontology of thought and semantics emerge as grammatical complexity increases, and no other Language of Thought theory is needed. The locus of human thought is placed in grammar and hence we can deny the necessity of postulating an 'interface' between language and a language-independent thought (the 'Conceptual-Intentional' systems of Chomsky 1995, for example). As a corollary, UG is not subject to parametric variation. **Noel Burton-Roberts** (Newcastle University) commented on some of Hinzen's points and centered on the relationship between language and thought. He compared Hinzen's position with that of B.L. Whorf, to which an interesting debate ensued.

Tom Roeper (University of Massachusetts, Amherst) opened the language acquisition session of the afternoon. His exposition started with a programmatic note; he argued that a critical goal of future work in UG must be to clarify: (i) how current generalizations reflect interface relations and (ii) how a theory of interfaces can constrain the language acquisition process. He then discussed some of the general biases that children employ when acquiring their native language. In particular, he argued for a theory of 'strict interfaces'. This theory

makes the formal claim that there is no linguistic variation in how modules connect, and the substantive claim that there are substantive 'strict interfaces' which are universal. He further proposed that a bias that children use is that of 'Minimal Modular Contact'; the idea that there is a single connection point between modules (a feature he linked with economy of design). The effects of this Minimal Modular Contact, he argued, can be observed in a variety of phenomena like the adoption of a 'general point of view', the generalization to one single operator, negative concord, the sequence of tense phenomena, etc. In my commentary to Roeper's talk, I framed his proposal within the generally accepted inverted Y-model of the architecture of grammar and underlined the predictions that this model makes regarding the class of possible languages. I also proposed some extensions of his ideas by exploring the possibility of applying them to other areas like the pair-list readings of multiple *wh*-questions, or the cross-linguistic unavailability of truly verbal *wh*-words.

Next came **Rosemary Varley**'s talk (University of Sheffield). She analyzed the relationship between language and thought by exploring the cognitive capacities of patients with language-related pathologies like global aphasia or agrammatic aphasia (see, among many others, Bek *et al*. 2010). After reviewing a number of studies and experiments, she concluded that there is no evidence of co-variation between language and reasoning in severely aphasic people; in fact, as some experiments suggest, our reasoning ability can be retained in the face of profound impairment of grammar. Furthermore, she stressed that aphasia should not be automatically seen as a matter of performance, but as a matter of competence. Thus, her conclusion is that the evidence from aphasic patients reveals that grammar is not necessary to support reasoning, and that there is considerable autonomy between language and thought. **Alex Drummond** (Durham University) extended and commented some of Varley's major points.

The last presentation of the conference came from **Jill de Villiers** (Smith College). She built her presentation upon some recent experimental work with adults that addresses the question: does combinatorial Merge of lexical concepts depend on access to the language faculty? She discussed studies analyzing whether children and adults can have the representations of complex eventualities with agents and themes but without language. In particular, the studies showed that (i) adults could not *remember an event* while their language faculty is tied up, such that they can recognize a new instance of that event, i.e. one describable by the same sentence, (ii) children could not 'hold' the 3-term event (SVO, agent – event – theme) to generalize it if they did not have the experience of a verbal description of it, and (iii) that tying up the linguistic capacity of adults with a different task made impossible the recognition of the similarity across a class of events sharing a proposition. A fourth experiment suggested that "natural kind" concepts and negation are about equally abstract for adults without experimental shadowing, but dramatically different under conditions of shadowing. She also discussed the implications of these findings for the relationship between language and thought, opening a new set of research questions to explore in the future. De Villiers' presentation was commented by **Annie Gagliardi** (University of Maryland) and that brought the Conference on UG to an end.

The session of December 18th was devoted to a 'satellite workshop' on minimalist theorizing and counted with presentations by **Hagit Borer** (University of Southern California), who discussed the so-called Borer–Chomsky conjecture and the combinatorial operations that generate words and **Halldór K. Sigurðsson** (Lund University), who argued for a novel theory of externalization with a non-isomorphic mapping from I-Language to E-Language. Besides, in my view, it was very fortunate that the last two talks of the meeting were representative of two very different, but complementary, argumentation styles in minimalist linguistic theorizing: A talk on phrase structure and cyclic transfer by **T. Daniel Seely** (Eastern Michigan University), which was a neat and clear exponent of the deductile style and reasoning that he and his colleagues have been employing over the last years, and the counterpart in style to this talk, which was the talk by **Michelle Sheehan** (University of Cambridge), who presented a powerful and comprehensive inductive analysis of the crosslinguistic variation in the PF component, especially regarding the availability of *pro*-drop.

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