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# One Word Order?: Conceptual Syntagmatics, Linguistic Imperialism, and the Consequences of English Syntax for Scientific Discourse

## Introduction

Is there information encoded within English syntax? For J.J. Hayes-Rivas, and others like him, this question has serious consequences. In his May 28, 2004, letter to *Science*, entitled “One World Scientific Language?” Hayes-Rivas raises this dire warning against our adoption of Standard English as a *lingua franca* in the sciences:

What will we be losing when all scientists write and think in a language that hems the description of facts and theories into a single Subject-Verb-Object (SVO) order? I do not think that one universal SVO language in science, to the exclusion of others, should be underestimated in its potential for severely skewing how scientists look at the world, time, space, and causality. (p.1243)

Steven Pinker (2007), in his book *The Stuff of Thought*, cites this passage as an example of the pervasive influence of a neo-Worfian Linguistic Determinism on our thoughts about language in general (p.135), but he leaves Hayes-Rivas’s specific allegations against English syntax untouched. This paper tests the proposition that a form of linguistic imperialism is, necessarily, operating at the level of SVO in English—not to deny that concepts of time, space, and causality are embedded there—but rather to challenge the assumption that those concepts are the only ones available to English, or indeed, to any language.

## Terminology, Scales, Theoretical Frameworks

Before we begin our investigation, it is important for us to map out the parameters of the debate. When we use the term *linguistic imperialism*, we are following in the footsteps of Robert Phillipson, whose book of the same name (1992) has become a lightning rod for both his supporters and detractors. In it, Phillipson defines *English linguistic imperialism* as a system through which “*the dominance of English is asserted and maintained by the establishment and continuous reconstitution of structural and cultural inequalities between English and other languages*” (p.47). Phillipson then places this linguistic species under the larger genus of *linguicism*: “ideologies, structures, and practices which are used to legitimate, effectuate, and reproduce an unequal division of power and resources (both material and immaterial) between groups which are defined on the basis of language” (p.47). From there, the term has spun out into a meme-like web of permuted compounds and increasingly inflammatory polyptots: linguistic capital (Phillipson 2007), linguistic ecology (Phillipson and Skutnabb-Kangas 1996), linguistic monopoly (Donskoi 2006), linguistic asymmetry and linguistic chauvinism (Ammon 2007); pragmatic multilingualism (Chew 1999; Bisong 1995), linguicism (Spolsky 2004)—linguicide (Skutnabb-Kangas and Phillipson 1996). Each is loaded, to varying degrees, with its own particular discursive cache of potentially explosive metaphorical connotations, and as Ulrich Ammon (2006) reminds us, “One should...be cautious with moral judgement which the term ‘imperialism’ doubtlessly suggests” (p.8).

Vladimir Donskoi (2006), meanwhile, seeks to untangle the metaphorical and moral connotations springing up around the terms *linguistic globalisation* and *linguistic imperialism* when he constructs a contradictory relationship between the two: “the one is what the other is not” (p.287). He then posits a contrary third term, *international practices*, that participates in both: “The next question to ask is whether the actual political and economic realities are representative of imperialism or of globalisation. In my opinion, the answer would be ‘neither, nor,’ for most of the international practices will fall somewhere in between” (p. 288). Despite this clean, logical dissection, Donskoi still laments, “Many scholars label the phenomenon in question as either ‘imperialism’ or ‘globalisation’ without wasting ink on identifying what the substantive differences between imperialism and globalisation [are]” (p.282). Thus, within the discursive practices surrounding English as a world scientific language, we still tend to polarize into two ideologically driven camps: one supporter’s “globalisation” is still another detractor’s “imperialism,” despite the logical distinctions made between them. What is important for us here is not which term is “correct,” but rather, the entire semantic field of competing terms from which many of Hayes-Rivas’s fears of an English One Word Order in science emerge. To a large extent, it is this semantic field that conditions the *pathos* behind Hayes-Rivas’s heartfelt appeal, and its *raison d’être*.

As well as terminology, a second preliminary consideration in our investigation is scale. Donskoi (2006) is again helpful here. He classifies the theoretical positions within the linguistic imperialism/globalisation debate into three levels: the *macro-level* where “languages interact with one another in the global arena,” the *meso-level* where “languages interact within societies, communities or social groups,” and the *micro-level* theories “which scrutinise linguistic phenomenon at the level of the individuals” (p.283). Donskoi then situates his “systemic theory of language interaction” firmly at the macro-level (p.283). Following Hayes-Rivas, our investigation turns instead to the opposite end of this scale, and beyond. Here, Donskoi’s micro-level would correspond to Noam Chomsky’s (1965) “*performance* (the actual use of language in concrete situations)” (p.4), or Ferdinand de Saussure’s (1916) *parole*, the individual acts of speech, the “putting into practice of language.” Our investigation goes one step further to Chomsky’s “*competence* (the speaker-hearer’s knowledge of his language)” (p.4), or de Saussure’s *langue*, “the abstract system of language that is internalized by a given speech community”—in a sense, the subatomic level of the linguistic imperialism/globalisation debate, if you will. It is here where Hayes-Rivas’s anxieties lie, because in his mind, English syntax, which he identifies as exclusively SVO, is the base-generator for the epistemic limitations he sees percolating up to the micro-level of individual scientists. Since these syntactical limitations would presumably occur no matter what the performance, or *parole*, of individual speakers or listeners, writers or readers, then the scale at which to test Hayes-Rivas’s proposition is at the level of competence, or *langue*.

But even here, there be dragons. Pinker's (2007) primary criticism of Hayes-Rivas's letter centres on its enactment of what Pinker sees as a "neo-Worfian Linguistic Determinism" (p.135). For Donskoi (2006), such support for Worf is unproblematic: "The epistemic value argument is based on the premise that each language carries a unique epistemic load (*cf.* Worf 1956)—an assumption that only few scholars deny. Accordingly, if a language ceases to exist, so will also its epistemic universe" (p.291). However, as Pinker (2007) reminds us, there are more theoretic positions in linguistics than merely Linguistic Determinism, and each is drastically different from Worf's: Extreme Nativism, Radical Pragmatics, and Pinker's own position, Conceptual Semantics, to name but a few. Pinker, in fact, places the latter in the middle of a triangular "game of rock-paper-scissors" (p.150), in which the limited explanatory power of any one (i.e., Linguistic Determinism, Extreme Nativism, or Radical Pragmatics) refutes the universality of the others. It should, perhaps, come as no surprise that in this mutually annihilating theoretical game, Pinker's Conceptual Semantics remains blissfully untouched. No matter which theoretic framework wins out in the end, however, we can safely say, in the here and now, that neither Donskoi, nor Hayes-Rivas, can take Worf's Linguistic Determinism as a given.

And therefore, neither can we. One problem at the heart of the entire debate over World English is that it takes place within the shadow of Martin Heidegger's famous antimetabole—now elevated to the level of a proverb in some circles—"Man does not speak Language; Language speaks Man." Within this shadow, the arguments over linguistic imperialism/globalisation cannot help but solidify into two mutually exclusive extremes: either Language determines Thought, or both are indeterminate. The first extreme posits a direct cause and effect relationship; the second assumes no causality at all—anywhere. There is, however, an excluded middle ground. Instead of a cause and effect relationship between Language and Thought, we could see it as a mutually interactive antecedent/consequent: changes in Thought have a certain probability of affecting (and effecting) changes in Language, while changes in Language have a certain probability of doing the same for Thought. Despite Pinker's use of Hayes-Rivas's letter as an illustration of neo-Worfianism, to be fair to Hayes-Rivas, what he actually says is that English's SVO syntax has only the "potential for severely skewing how scientists look at the world"; this is an antecedent/consequent relationship, not a strict cause and effect. Therefore, Hayes-Rivas is not really advocating a neo-Worfian determinism as Pinker claims. For our study, however, because the antecedent/consequent is probabilistic rather than certain, this relationship allows for our antecedent words to have epistemic consequences, and vice versa, from the competence level all the way through to the macro-level within our linguistic economy/ecology, but as heartening as this system sounds, we must not forget that none of these consequences, for better or for ill, can ever be guaranteed.

It is within this theoretical framework that we lay the central aim of this study. As an analogy, we can think of World English as a drug. There is a debate raging as to whether that drug is a beneficial pharmaceutical (as globalisation advocates would have it) or a deadly poison (as the linguistic anti-imperialists would see it). Scholars of both camps have extensively researched the habits and choices of the drug's individual users (Donskoi's micro-level), its dealers and marketers (the meso-level), and its global distribution patterns and networks (the macro-level). However, we still do not know whether that drug really has the benign effects promoted by its supporters, or the malignant effects warned against by its detractors. It is in this spirit that we now break open the syringe of World English, and conduct a preliminary linguistic analysis of the liquid inside.

## Epistemic Loss and SVO

Central to Hayes-Rivas's fear of an English planet is the concept of epistemic loss. He is not alone. Ulrich Ammon (2006) expresses it this way: "The unavoidability of loss, even loss only of the heuristic or mnemonic enhancement of thought, would certainly be reason for grave concern. Such loss could certainly provide serious arguments against the reduction of the languages of science" (p.18). Invoking the Humboldt-Worf hypothesis (Linguistic Determinism), however, Ammon turns linguistic imperialism on its head when he suggests that if the Humboldt and Worf hypothesis is true, then English as the only international scientific language actually "works in favour of non-Anglophones who, from their multilingual perspective, should on average be scientifically more creative" than their monolingual Anglophone counterparts (p.17). The way this argument works strikes at the heart of Hayes-Rivas's proposition. If an English SVO syntax skews us towards linear epistemes of time, space, and causality, then those who speak it are limited to some extent to those thought patterns. Meanwhile, someone who speaks SVO English and one or more non-SVO languages has the benefit of both linear and non-linear perspectives, and so has a larger epistemic field from which to draw. We need only think of quantum mechanics to see the worth of such variety for scientific thought.

Unfortunately, linguistically, a universalist, generative grammar does not bear out this promising potential for epistemic extension. Chomsky (1965) in his *Aspects of the Theory of Syntax* states, "The existence of deep-seated formal universals... implies that all languages are cut to the same pattern" (p.30). Those "deep-seated formal universals," inevitably SVO, become the deep structure of any sentence, in—conceivably—any language. Any variation from that word order, whether intra- or interlingual, then becomes a surface structure, derived through a series of transformational (or topicalisation) rules, from a deeper structure and base. What is significant here, though, is that for Chomsky (at least in 1965), meaning is generated solely at the level of deep structure:

the syntactic component consists of a base that generates deep structures and a transformational part that maps them into surface structures. The deep structure of a sentence is submitted to the semantic component for semantic interpretation, and its surface structure enters the phonological component and undergoes phonetic interpretation. (p.135)

In other words, the SVO deep structure involves the interpretation of meaning; the non-SVO surface structures—and that includes all non-SVO languages—are just sound. Accordingly, SVO deep structures are what we are really thinking; non-SVO surface

structures are only what we hear.

We could be accused of oversimplifying Chomsky's grammar here, were it not for the fact that he, himself, says in the same work, "It follows, then, that transformations [i.e., surface derivations, or topicalisations, from the deeper SVO] cannot introduce meaning-bearing elements" (p.132). The implication for our examination is that English, with its SVO syntax largely already in place, requires little (e.g., passives and wh-questions) to no transformations to reveal its meaningful deep structure. Non-SVO languages, on the other hand, being all surface, must first be distilled down, through transformational (or topicalisation) rules, to their deep structure SVO equivalents, where, presumably, their true meaning resides. In short, then, all languages are really SVO languages at their deep structures; some, like English, are more directly, more conveniently, SVO, and so, they, therefore, are just simply more *efficiently* meaningful, than their non-SVO counterparts.

It could be argued that a lot has changed in linguistics, and in generative grammar specifically, since 1965. Derek Bickerton (2009) tells us, "That theory [generative grammar] has passed, since its inception, through at least five avatars [note the quasi-mystical metaphor here]: Chomsky's original (1957) formulation, the Standard Theory, the Extended Standard Theory, the Principles and Parameters framework, and the Minimalist Program. Each new avatar has undertaken a radical revision of its predecessor" (p.13). Meanwhile, T. Givón (2009) reminds us that Chomsky is not the only generative game in town: Chomsky, representing *deep universals*, is at one end of a spectrum of universality; Joseph Greenberg, as a compromise, takes the middle position; and, at the other end, representing *surface universals*, lies Leonard Bloomfield (p.95). Thus, generative grammar precedes Chomsky (Bloomfield in the 1930s) and continues after him (Greenberg in the 1970s, and now Givón in the 2000s). In this light, it would be unfair to collapse all of generative linguistics to one text written by one man in 1965.

However, we do still see the ghost of the generative reduction of languages lingering behind present-day grapplings with VSO languages, such as Gaelic or Welsh. Luigi Rizzi (2009), in using the Merge and Move functions of generative grammar's latest "avatar" Minimalism, is perplexed by VSO: "But how can such a binary subject-predicate articulation [i.e., SVO] be expressed in a VSO language, in which the subject apparently interpolates between the two constituents of the verb phrase?" (p.75). Following Emonds (1980), Rizzi tells us, "The natural solution is that the VSO order is derived via verb movement [i.e., surface transformation or topicalisation] to an inflectional head X from an underlying SVO (or SOV) order" (p.76). Meanwhile, French (SOV) too has its transformations and topicalisations away from the deep structural, binary subject-predicate articulation, SVO: "Perhaps X is T, and VSO languages have V to T movement as in French" (p.76). The result amounts to a syntactic disciplinary action against VSO languages: "Thus, *recalcitrant* [emphasis mine] VSO languages can be traced back to familiar ingredients: a basic order permitting the subject-predicate articulation [again, SVO] and head movement [surface transformation or topicalisation] of the verb to the functional system" (p.76). If we peer past this alphabet soup of variables and functions, we can see that fundamentally nothing much has changed since 1965: French is SVO, but with the verb transformed, or topicalised, to a surface position at the end of the sentence; Gaelic is SVO, but with the verb, this time, transformed, or topicalised, to an inflectional head at the beginning of the sentence. Whether we call SVO a "binary subject-predicate articulation" or a "deep structure," all surface syntactical roads in any language still lead to a deep, meaningful SVO, and that final destination just happens also to be the default syntax for English.

## Towards a Conceptual Syntagmatics

Before we abandon ourselves to the arms of a syntactic linguistic imperialism at the subatomic level of competence, we do need to ask ourselves whether it, necessarily, has to be this way. It is here that we propose an alternative: conceptual syntagmatics. Essentially, conceptual syntagmatics is an extension of Pinker's conceptual semantics into the syntactic realm. "The theory of conceptual semantics," as Pinker (2007) puts it, "proposes that word senses are mentally represented as expressions in a richer and more abstract language of thought" (p.150). Because conceptual semantics is concerned with word senses, Pinker's examples involve differences in word choice, or insertions along the vertical, paradigmatic axis of a sentence. For example, Pinker derives conceptual differences in the way we think about the manipulation of liquids and their relationship to containers through a comparison of the standard "I *fill* the glass with water" with the ungrammatical (or un-English) "I *pour* the glass with water" (p.49). What conceptual syntagmatics does is apply this comparative methodology instead to variations in word order, not word choice, as a way to isolate conceptual differences along the syntagmatic, horizontal, or syntactical, axis of a sentence. In contrast to generative linguistics as it presently stands, then, conceptual syntagmatics allows for the generation of meaning *between* the deep structure of a sentence and its surface topicalisations or transformations. With conceptual syntagmatics, the surface structure is no longer mere phonetics or sound; it becomes a supporting player in semantic generation.

To illustrate how this principle might apply both to Hayes-Rivas's proposition and scientific discourse in general, let us conduct a thought experiment. Here are three sentences drawn from scientific journal articles:

- (1) (a) The electric field drives the proteins out of the liquid lamella.
- (b) The sodium hydroxide in a quasi-instantaneous chemical reaction neutralises the hydrochloric acid.
- (c) The subordinate agents follow the supervisory agent's schedule in the absence of disturbances.

Sentences (1a) and (1b) are adapted from Boethe, Lojewski, and Warnecke (2010); sentence (1c) is adapted from Xiaobing Zhao Son (2007). All are standard SVO: (1a) field drives proteins, (1b) hydroxide neutralises acid, and (1c) agents follow schedule. In terms of generative linguistics, all three constitute the deep structure for each sentence. As we have seen, the fact that all three are

already in SVO makes each one semantically efficient, because they require no further topicalisations or transformations to extract the meaning from the surface sound.

Now let us look at the same sentences again, but this time with their elements topicalised, or transformed:

- (2) (a) Drives the electric field, out of the liquid lamella, the proteins.  
 (b) In a quasi-instantaneous chemical reaction, the sodium hydroxide, the hydrochloric acid, neutralises.  
 (c) The supervisory agent's schedule, the subordinate agents follow in the absence of disturbances.

In (2a), the most drastic of the transformations, we have an approximation of Gaelic's VSO: the verb ("drives") moves to the beginning of the sentence, while the prepositional phrase, "of the liquid lamella," now stands between the subject ("the electric field") and its direct object ("the proteins"). This transformation propels the direct object to the farthest reaches of the sentence away from the verb. In (2b), the prepositional phrase, "In a quasi-instantaneous chemical reaction," is transformed to the beginning of the sentence, while the direct object ("the hydrochloric acid") is transformed to between the subject and the verb. Finally, in (2c), the direct object, "the supervisory agent's schedule," is transformed, or topicalised, to the beginning of the sentence. According to generative grammar, then, these movements would yield the following surface structures: (2a) V-S-PP-O, (2b) PP-S-O-V, and (2c) O-S-V-PP.

The question then becomes whether there is any semantic content contained in the surface syntax of (2a, b, and c) that is lost to the deep structure syntax of (1a, b, and c). In the case of (2a), the proteins are now driven out through the liquid lamella to the end of the sentence. In (1a), the proteins came first in syntactical space, the lamella, last—in a sense, driving the proteins into the lamella, instead of out of it. In (2b), the quasi-instantaneous reaction takes place—instantaneously—as the hydroxide and acid collide before the verb, through the nearly atemporal sequence "reaction/hydroxide/acid/ neutralise." Some may argue here that such a topicalisation, as we see in this sentence, threatens to create confusion over the true subject of the sentence, but in such a quasi-instantaneous reaction, who really is acting on whom? In (2c), the supervisor's schedule comes first and the subordinates follow it in sense as well as syntactic space. In all three cases, the SVO deep syntax of (1a, b, and c) pulls against the sense of the sentence; in (2a, b, and c), the surface syntax propels that sense forward—and we can hear and feel this acceleration quite viscerally in (2a)'s Gaelic VSO. Thus, the syntax of the surface structures can contribute to the semantic content of a sentence. Granted, those surface structures do not alone make up that semantic content, but they do add to it.

In this way, the surface structures do not replace the deep structures; instead, they supplement them. We need to compare each to the other to extract the additional semantic content. In the same way, conceptual syntagmatics is not meant to replace generative grammar, but rather to call into question its totalising discourse through a demonstration, in its own terms, that deep structures are not alone in generating meaning. For *totalising discourse*, here, we could just as easily substitute *linguistic imperialism*, at least at the syntactic level of competence. And thus, Hayes-Rivas really has nothing to fear about epistemic loss through English: non-SVO spatial epistemes can still be generated through the surface structure of (2a), near-instantaneous temporal and causal relations can still find their expression in (2b), and hierarchical relationships that run counter to SVO can still be contained within the syntax of (2c). If there is a real culprit, then, behind linguistic imperialism at the syntactic level, it is not English, but rather, our assumption that SVO is the sole generator of meaning. And what applies here to English also applies *in potentia* to French, German, Italian, Hebrew, Chinese, Gaelic...or indeed, to any language.

## On Syntax and Evolution

We will end here with a cautionary note to the burgeoning field of linguistic evolution. Bickerton and Szathmáry (2009) close their "Preface" to *Biological Foundations and Origin of Syntax* with this panegyric on syntax: "Syntax lies at the very heart of what it means to be human. It is the thing, indeed the only thing that enables us to bring words together to form complex and meaningful statements. Without it, we would have no law, no science, no economics, no philosophy, no literature" (p.xviii). Later, Bickerton (2009) defines the scope of evolutionary syntactics this way: "Our focus should be firmly fixed on what humans, and their brains, had to be able to do in order to rapidly, automatically, and unconsciously produce sentences that would fall within the quite narrow bounds that delimit human language" (p.12). Just how narrow we make those bounds strikes at the heart of the issue raised by Hayes-Rivas, and examined here. In a round-table paper on the biological and genetic foundations for syntax, in the same volume, Számádó et al. (2009) begin with a caution that "English should not be assumed to be a typical natural language" (p.208), but then, on the very next page, they fall back into SVO: "certain models look simpler in that they use very shallow, essentially flat tree diagrams (e.g., a ternary tree for clauses: [SVO]) rather than more articulated and 'deeper' binary structures like [S[VO]]" (p.209). Despite the superficial differences in labelling (the latter, once again, adopts the Merge/Move binary notation of generative grammar's latest incarnation, Minimalism), both default back to a deep structure SVO. At the level of syntax, then, there really is no difference. Granted, Számádó et al. do not tie this default evolutionary SVO specifically back to English, but there are others who will.

The idealistic hope, then, informing conceptual syntagmatics is that we will make room for valuable syntactical and epistemic relationships in all Language and Thought. Conceptual syntagmatics seeks to provide a framework for demonstrating that value—the semantic worth, and work, if you will—contained in various syntactic patterns, not just SVO. Surely, there must also be some competitive evolutionary advantage, for science and for humanity, in communicating non-linear, non-sequential, non-SVO epistemes: whether it be the time-bending pressures of a black hole, the blossoming meiosis of a cell dividing, or the blush of a first kiss. What's more, if this meaningful syntactic space exists in non-SVO English, then it exists in all non-SVO languages as well,

and suddenly, one of the major competitive advantages—semantic efficiency—touted by the more Social-Darwinist proponents of English as a World Language, disappears. Thus, the potential for a conceptual syntagmatics is there, no matter what language becomes the One Language of science, or the world. Bickerton (2009) notes, “Languages may adopt strategies other than sequential ordering of Merge (e.g., case markings) in order to achieve a greater degree of freedom in ordering constituents” (p.5). Our question remains—Are we willing to do the same?

## Bibliography

- . Ammon, U. (2006) “Language planning for international scientific communication: An overview of questions and potential solutions.” *Current Issues in Language Planning* 7(1), 1–30.
- . Bickerton, D. (2009) “Syntax for non-syntacticians: A brief primer.” In D. Bickerton & E. Szathmáry (Eds.) *Biological foundations and origin of syntax*. (pp. 3–12) Cambridge, MS & London, EN: MIT Press.
- . Bisong, J.O. (1995) “Language choice and cultural imperialism: A Nigerian perspective.” *ELT Journal* 49(2), 122–132.
- . Boethe, D., Lojewski, A., & Warnecke, H.J. (2010) “Computational analysis of an instantaneous chemical reaction in a T-microreactor.” *Center for Smart Interfaces*. Retrieved from [http://www.csi.tudarmstadt.de/media/csi/institutes/mma/bilderdateien\\_5/publication/computationalanalysis2010.pdf](http://www.csi.tudarmstadt.de/media/csi/institutes/mma/bilderdateien_5/publication/computationalanalysis2010.pdf)
- . Chew, P.G. (1999) “Linguistic imperialism, globalism, and the English language.” In U. H. Meinhof & D. Graddol (Eds.) *English in a changing world. AILA Review* 13, 57–68.
- . Chomsky, N. (1965) *Aspects of the theory of syntax*. Cambridge, MS: MIT Press.
- . Donskoi, V. (2006) “Systemic theory of language competition.” *Journal of Language and Politics* 5(2), 277–298.
- . Givón, T. (2009) “The adaptive approach to grammar.” In D. Bickerton & E. Szathmáry (Eds.) *Biological foundations and origin of syntax*. (pp. 89–116) Cambridge, MS & London, EN: MIT Press.
- . Hayes-Rivas, J.J. (2004) “One world scientific language?” *Science*, 304, 1243.
- . Phillipson, R. (1992) *Linguistic imperialism*. Oxford: Oxford UP.
- . Phillipson, R. & Skutnabb-Kangas, T. (1996) “English only worldwide or language ecology?” *TESOL Quarterly* 30 (3), 429–452.
- . Pinker, S. (2007) *The stuff of thought: Language as a window into human nature*. New York, NY: Penguin.
- . Saussure, F. de (1916) *Course in general linguistics*. Trans. Wade Baskin. New York, NY: Philosophical Library, 1959.
- . Skutnabb-Kangas, T. & Phillipson, R. (1996) “Linguicide and linguicism.” In H. Goebel, P. H. Nelde, Z. Stary, & W. Wölck (Eds.). *An international handbook on contemporary research*. Vol. 1. Berlin & New York: Walter de Gruyter, 667–675.
- . Spolsky, B. (2004) *Language policy*. Cambridge: Cambridge UP.
- . Számádó, S., Hurford, J.R., Bishop, D.V.M., Deacon, T.W., d’Errico, F., Fischer, J., Okanoya, K., Szathmáry, E., & White, S.A. (2009) “What are the possible biological and genetic foundations for syntactic Phenomena?” In D. Bickerton & E. Szathmáry (Eds.) *Biological foundations and origin of syntax*. (pp. 207–236) Cambridge, MS & London, EN: MIT Press.
- . Rizzi, L. (2009) “Some elements of syntactic computations.” In D. Bickerton & E. Szathmáry (Eds.) *Biological foundations and origin of syntax*. (pp. 63–87) Cambridge, MS & London, EN: MIT Press.
- . Xiaobing Zhao Son, Y.J. (2007) “Penalty function-based two-level hybrid shop floor control system.” *Automation Science and Engineering* 4(2), 220–232.