

Типы скрэмблинга в славянских языках

Scrambling types in the Slavic languages¹

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Статья содержит классификацию разновидностей скрэмблинга т.е. отношения нефиксированного порядка категорий предложения в славянских языках. Принимается точка зрения о том, что все виды скрэмблинга возникают в результате факультативных синтаксических перемещений. Для систем порядка слов и формальных грамматик, предназначенных для распознавания структур со скрэмблингом, релевантны как свойства конечных областей перемещения, так и свойства исходных областей. В славянских языках представлены все четыре возможных типа скрэмблинга полноударных элементов предложения. Впервые выделены диагностические признаки двух типов скрэмблинга клитик.

1. Basic terminology and framework

In this section I am giving working definitions of the basic terms and specifying the framework of my paper. The term ‘scrambling’ is used a characteristics of languages generating well-formed sentences which can be linearized in two or more ways. Linearization is defined as an operation preserving syntactic structure i.e. a hierarchy of syntactic positions but changing the linear order of sentence categories manifested by spelled-out (non-zero) elements. The scrambling condition is defined in a scrambling language L_{sc} for any two sentence categories x and y if their relative order may be inverted in the linear variants of the same sentence structure with a fixed number of positions and a fixed number of non-zero categories filling these positions: $x...y \sim y....x$. Linguistically interesting cases pertain to scrambling of sentence categories of the same type and/or the same phrase level: a) scrambling of verbal arguments; b) scrambling of adjuncts; c) scrambling of modifiers; d) scrambling of verbal heads; e) scrambling of phrasal constituents. In this paper I mostly discuss argument scrambling: the term ‘argument’ below is used both for internal arguments (‘objects’ of traditional grammar) and external arguments (‘subjects’ of traditional grammar).

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The framework of this paper is the theory of formal grammars and its applications to natural language processing; I am particularly interested in formal grammars capable of generating languages with partly unordered sentence trees, cf. [Stabler 1997], [Michaelis & Gärtner 2007], [Rambow 1994]. The mode of representation of sentence trees as dependency trees vs constituency trees does not affect generative capacity of a language and does not play a crucial role for my argumentation; however, in this paper I opt for a constituency notation. Natural languages and their word order systems are treated in this paper mainly as instantiation of formal languages and their grammars: the data from natural languages are considered relevant for checking and revising formal grammars and parsing procedures. A word order system is defined as a set of language-specific constraints on word order or as set of type-specific word order constraints shared by similar languages. I am assuming that meta-linguistic knowledge about well-formed and ill-formed expressions can always be retrieved and am adopting the criterion of intuitive adequacy. The judgments on well-formedness or ill-formedness of the test sentences are based on normative grammars, representative descriptions and opinions of the native speakers.

Formal grammars capable of generating scrambling languages may be either context-sensitive or tree-adjoining/mildly context-sensitive. Stablerian Minimalist Grammars [Stabler 1997], [Michaelis & Gärtner 2007] and Chomsky's Minimalist Program [Chomsky 2005] pattern with the last class. In the Minimalist-type grammars scrambling may be licensed due to two reasons: a) the pair of sentence categories $\dots x, y \dots \sim \dots y, x \dots$ remains unordered if the grammar has a special *scrambling operator*, so neither order results from a reordering mechanism; b) the order $\dots y, x \dots$ is derived from the order $\dots x, y \dots$ by a unidirectional mechanism called *movement*. In section 2 I am briefly discussing the pros and cons of the movement vs non-movement approaches to scrambling and adopting the movement approach. I am assuming that the direction of movement can be established in all pairs $\dots x, y \dots \rightarrow \dots y, x \dots$ and that each instance of movement has some functional motivation. At the same, all kinds of unverifiable stipulations concerning the amount of movement and scrambling patterns licensed on the level of Universal Grammar (UG) are rejected. I am assuming that word order systems of natural languages do not violate UG but the proportion of language-specific and universal features is irrelevant for my analysis. Furthermore, I am not aiming at describing cross-linguistic variation or singling out language types in this paper: the data from Slavic languages are used merely as an illustration of formal models represented in natural languages and a motivation for revising these models.

2. Free word order, scrambling and movement

The term 'free word order' is metaphoric since all world's languages are restrictive: no language seems to allow for all possible linear orders or sentence categories in 100 % of sentences and it is reasonable to think that linearization constraints are

salient for all word order systems. Meanwhile, there is a general agreement that free word order is a condition when sentence categories may be linearized in two or more different ways, at least in some well-formed sentences of a given language. This condition is known as scrambling of predicate arguments and/or other sentence categories. The term ‘scrambling’ is sometimes used just as a synonym for ‘free word order’ but may also convey a more formal meaning and be linked with hypotheses on mechanisms triggering free word order. It has become customary to classify natural languages into a class of languages with a fixed order of lexical sentence categories and a class of scrambling languages. For instance, an English sentence like *Pete ate a tomato* does not have a linear variant **A tomato ate Pete*, since this language blocks for OVS orders². The class of scrambling languages can be defined in a twofold way — either as a) languages displaying a number of diagnostic movement patterns responsible for the alternations like SVO > VSO, SVO > OSV, SVO > OVS, SVO > SOV; or b) languages completely lacking any fixed order of diagnostic sentence categories, say S and O or S, O and V, cf. [Kosta 2006]. Both approaches to scrambling share the assumption that the same numeration, i. e. tree structure with a given number of nodes filled by identical elements, may be linearized differently.

A movement approach to scrambling languages capitalizes the idea that there is a unidirectional relation between different linear variants of the same numeration, one of the variants being the source of the other (s), cf. the presumably base-generated order in Rus. [...] *Петя съел помидор* and the derived order [*Помидор_i*,] *Петя съел t_i*; the symbol *t* marks the initial placement of the moved category before the reordering, and the brackets [...] mark the target position of the movement. A non-movement approach to scrambling denies the idea of a fixed order of sentence categories in a scrambling language and treats all linear variants as representing the same level of derivation, cf. Rus. *Петя съел помидор* (SVO) ~ *Петя помидор съел* (SOV) ~ *Помидор Петя съел* (OSV) ~ *Помидор съел Петя* (OVS) ~ *Съел Петя помидор* (VSO) ~ *Съел помидор Петя* (VOS). The domain where categories scramble may be called scrambling domain. In the standard case illustrated by the Russian examples above, argument scrambling is bounded with a single clause, while all scrambled arguments S, O..U..W belong to one and the same verbal head *v*^o:

- (i) Local Scrambling: [_S{_{SCRAMBLING DOMAIN} ...S...*v*^o...O...}].

Scrambling of the type (i) is called ‘local’ or ‘bounded’; it does not pose big problems for linguistic theory with either non-movement or movement analysis, since all positions available for a scrambled category are located in one and the same domain.

² A sentence like *A tomato ate Pete* will be proven well-formed if we assume that carnivorous vegetables exist but again the sentence *A tomato ate Pete* won’t get a linear variant *Pete ate a tomato* used in the same bizarre meaning “A human has been eaten by a vegetable”. Consequently, the ungrammaticality of the SVO > OVS alternation in English does not depend on ontological assumptions about carnivorous vegetables and human vegetarians.

Meanwhile, there is undeniable evidence that world's languages have unbounded scrambling, where the permuting arguments may belong to different verbal heads $v^1, v^2.. v^n$. This has been proven in [Rambow 1994] for Modern German, where unbounded argument scrambling takes place in complement clauses (CPs) in the domain between the complementizer (Comp) and the verbal complex, cf. (ii). Note that the verbal heads themselves are placed in German in a rigid order, so that the scrambling domain is smaller than the complement clause:

(ii) Unbounded Scrambling in German:

Ger. [_{CP} Comp {_{SCRAMBLING DOMAIN} $A^1 + B^2 + C^3$ } [_{VP} [v^3 , [v^2 , [v^1]]] AUX].

Many formal grammars and semi-formal models of language representation including Chomsky's Minimalist Program [Chomsky 1993], [Chomsky 2005] and Stablerian Minimalist Grammars [Stabler 1997] generate ordered trees. Grammars of this type are mildly context-sensitive [Michaelis & Gärtner 2007] and can be adjusted for parsing scrambling languages: in this case their formalism must be extended by a special Scrambling operator in addition to standard Merge and Move operators responsible for merging and moving of sub-trees [Perekrestenko 2008]³. At first glance this technical detail speaks in support for a non-movement analysis of scrambling, at least in a generative framework sharing the basic assumptions of the Minimalist Program. However, a reasonable linguistic interpretation of unbounded scrambling in (ii) is only possible under movement analysis: otherwise the question how an element of an already ordered subtree shows up in a higher clause remains unexplained. Since I am aiming at a unified account of all scrambling types, I am adopting movement analysis for all theoretically possible types of scrambling: for the reasons of space I am using a simplified notation of target positions and scrambling domains.

The distinction of local vs unbounded scrambling is consistent and useful both for formal grammars and for data-oriented linguistic research. Under movement analysis, the scrambling type (local vs unbounded) is established in the end positions scrambled elements assume after the movement has taken place, not in their initial positions before the reordering. Unfortunately, there is a different terminological tradition in generative linguistics, where scrambling is frequently understood as a characteristics of the initial domains. For instance, J. Baylin [Baylin 2004] sorts out 'short' scrambling when an element moves to a target position in the same clause, and 'long-distance scrambling' when an element is extracted (raised) into a higher clause. This distinction makes sense only if initial positions of the moved sentence material are relevant: it is clear that the terms are misleading and extraction won't entail scrambling in the final domain if the moved element takes just one position in the higher clause. The puzzle is explained by the fact that in the standard case, under local scrambling, where the scrambled elements remain in the same clause, the initial and the final movement domains match or coincide.

³ However, the parsing problem for Minimalist Grammar extended with Unbounded Scrambling operators remains unresolved as shown in [Perekrestenko 2008].

This proportion does not hold for other scrambling types and it would be better to reserve the specific term ‘scrambling’ only for the pair ‘local vs unbounded scrambling’ and replace it by the general term ‘movement’ in the pair ‘short vs long-distance scrambling’. Unless this is done, the term ‘scrambling’ remains ambiguous but one may try to tackle the problem from the other side and check which theoretically possible combinations of local vs unbounded scrambling & short vs long-distance scrambling are attested. If such combinations really exist and represent productive scrambling types used by the native speakers, this would confirm that a multidimensional analysis of linear alternations both in terms of final vs initial movement domains is on the right track.

This paper summarizes the data of Slavic languages — a group of languages known for a wide variety of movement patterns, cf. [Ковтунова 1976], [Kosta 2006], [Baylin 2004], [Циммерлинг 2008], [Franks 2009] The analysis has shown that almost all combinations of scrambling types are available for sentence categories represented by non-clitic words, while the number of scrambling types available for clitics is more reduced. Unless the opposite is explicitly stated, the scrambling types attested for non-clitic words are treated to be Pan-Slavic: the general prediction is that other Slavic languages likely have well-formed sentences within the same scrambling type but no prediction that an exact equivalent of a well-formed sentence with scrambling will be equally well-formed in other Slavic languages is made.

2.1. Local short scrambling and local long-distance scrambling of non-clitic elements

Let us agree that *Local* scrambling indicates that permuting elements belong to the same verbal head, *unbounded scrambling* indicates that the permuting elements belong to different verbal heads. With *short* scrambling, the moved element remains in the same clause. With *long distance* scrambling, the moved element is extracted to a higher domain. The combinations ‘Short & Local Scrambling’, ‘Long-Distance & Local Scrambling’, ‘Long-Distance & Unbounded Scrambling’ are common, the combination ‘Short & Unbounded Scrambling’ is rare. All cases where an element is extracted out of non-finite clauses (IPs) count as long-distance scrambling, along the same lines as extraction out of finite clauses (TPs). Almost all combinations of Local/Unbounded Scrambling with Short/Long-Distance Scrambling were found. The Scrambling condition was tested on sentences perceived as completely grammatical or acceptable by the native speakers and on authentic examples from extinct languages. A minor part of the test sentences with scrambling proven to be well-formed does not sound quite natural in a oral discourse or are generally avoided in written texts on stylistic reasons. This is not an obstacle for my analysis since my aim was to check syntactic parameters enabling or blocking for scrambling and not to find linear orders that could be used in a maximal number of different contexts. I am assuming that movement of sentence categories triggering the scrambling condition always has some communicative motivation but do not prove this point formally here. The term ‘non-clitic sentence category’ in the following refers to phrases, not phrasal heads.

Fig. 1. Scrambling of non-clitic elements in the Slavic languages

	A. Local Scrambling	B. Unbounded scrambling
1. Short scrambling	+	(+)
2. Long Distance Scrambling	+	+

A1. Short & Local Scrambling.

This option is standard: the moved element is not extracted to a higher clause, no unprojective crossing of constituents arises:

- (1) a. Rus. Профессор Иванов посетил нашу лабораторию в июне
(S+V+O+Adv_{Temp})
Professor_{Nom.Sg.M.} Ivanov_{Nom.Sg.M.} visit_{3Sg.M.Pst.} our_{Acc.Sg.F.} laboratory_{Acc.Sg.F.} in June_{Loc.Sg.}
“Professor I. visited our laboratory in June”
- b. ⇒ [Нашу лабораторию]_i профессор Иванов посетил _{t_i} в июне (O+V+S+Adv_{Temp}).
our_{Acc.Sg.F.} laboratory_{Acc.Sg.F.} visit_{3Sg.M.Pst.} Professor_{Nom.Sg.M.} Ivanov_{Nom.Sg.M.} in June_{Loc.Sg.}
“the same”.

A similar relation can be shown for adjuncts, cf. Czech examples in (2).

- (2) a. ... že Maria profesora_i [v jeho_i bytě] už několikrát navštívila.⁴
That Maria_{Nom.Sg.F.} professor_{AccSg.M.} in his_{Gen.Sg.M.} flat_{Loc.Sg.} already several.time
visit_{3Sg.F.Pst.}
“...that Mary has already several times visited the professor_i [in his_i flat]”.
- b. ⇒ чеш. ... že [v jeho_i bytě] Maria profesora_i _{t_i} už několikrát navštívila.
That in his_{Gen.Sg.M.} flat_{Loc.Sg.} Maria_{Nom.Sg.F.} professor_{AccSg.M.} already several.time
visit_{3Sg.F.Pst.}
“the same”.
- c. ⇒ чеш. že Maria [v jeho_i bytě] profesora_i _{t_i} už několikrát navštívila.
That Maria_{Nom.Sg.F.} in his_{Gen.Sg.M.} flat_{Loc.Sg.} professor_{AccSg.M.} already several.time
visit_{3Sg.F.Pst.}
“the same”.

A2. Long-Distance & Local Scrambling.

The scrambling condition is found in the initial domain but not in the final domain. This is possible if the extracted element has just one target position in the higher domain.

- (3) a. Rus. Мы бы хотели, чтобы министерство назначило профессора И.
куратором нашей лаборатории

⁴ The examples in (4) are from [Kosta 2006].

We_{Nom.Pl.} Cond.Pcl want_{1Pl.Cond} that ministry_{Nom.Sg.N.} appoint_{3Sg.N.Cond.} professor_{Acc.Sg.M.} I.
curator_{Instr.Sg.M.} our_{Gen.Sg.F.} laboratory_{Gen.Sg.F.}
“We would like that the ministry appointed professor I. curator of our
laboratory”.

- b. ⇒ [[Профессора И.], [мы бы хотели, [чтобы министерство назначило
t_i куратором нашей лаборатории]]].
Lit. ‘Professor I_i, we would like [that the ministry appointed t_i curator of
our laboratory]’
“the same”.

Cf. also Bulgarian example with extraction out an NP containing an embedded
relative clause:

- (4) a. Bulg. Ще=бъдат [две тоалетните, [като всеки от състезателите ще=може
да ползва [която пожелае]].
Fut.Pcl. be_{3Pl.Fut} two toilet_{Nom.Pl.Def.} which any from sportsman_{3Pl.Def.} Fut.Pcl
can_{3Sg.Pres.} Comp use_{3Sg.Pres.} who want_{3Sg.Pres.}
“There will be two toilet rooms [which can be used by any of the sportsmen
[who wants]]”.

- b. ⇒ [[Тоалетните]_i ще бъдат [две t_i, като всеки от състезателите ще=може
да ползва [която пожелае]]].
toilet_{Nom.Pl.Def.} Fut.Pcl. be_{3Pl.Fut} two which any from sportsman_{3Pl.Def.} Fut.Pcl
can_{3Sg.Pres.} Comp use_{3Sg.Pres.} who want_{3Sg.Pres.}
“the same”.

B2. Long-Distance & Unbounded Scrambling.

Sentences with three scrambled NPs A¹, B², C³ linked with three hierarchically
arranged verbal heads are rare. Sentences with two scrambled NPs A^m, Bⁿ, linked with
two hierarchically arranged verbal heads v^m, vⁿ are wide-spread. One of the common
cases of long-distance unbounded scrambling is triggered by non-projective embed-
ding of a constituent or its element into a higher clause. Let A° B° C° D° E be the basic
word order, A° B° C° D° be lexical heads and each next head be a dependent of the pre-
ceding one. It gives a projective structure (5), where blocks DE, CDE, BCDE, ABCDE
are embedded constituents:

- (5) [A° [B° [C° [D° E]]]]].

- (5') Rus. Арбитры¹ не имели права¹ [и_п фиксировать² [победу² «Триумфа»]].
Referee_{Nom.Pl.} not have_{3Pl.Pst.} right_{Gen.Sg.} fix_{Inf.} win_{Acc.Sg.} ‘Triumph’_{Gen.Sg.}
‘The referees¹ had no right¹ to fix² the win² of ‘Triumph’.

Moving the blocks DE, CDE and embedding the heads A°, B° into lower constitu-
ents one can get orders like [CDE]_i A° B° t_i, [[DE]_j C° t_j]_i A° B° t_i, [[DE]_j... A°_k ... C° t_j]

$t_k B^\circ t_i, \dots A^\circ_k \dots [[DE]_j C^\circ t_j]_i t_k B^\circ t_i$, where $t_{i,j,k}$ — traces of the moved heads or blocks. An illustration is provided in fig. 2.

Fig. 2. Long-Distance Unbounded Scrambling in Russian

	Pattern	Illustration
Basic word order	$[A^\circ [B^\circ [C^\circ [D^\circ E]]]]$	(6a) рус. Арбитры ¹ не имели права ¹ [_{IP} фиксировать ² [победу ² «Триумфа»]].
Derived orders	$[CDE]_i A^\circ B^\circ t_i$	(6b) Ю
	$[[DE]_j C^\circ t_j]_i A^\circ B^\circ t_i$	(6c) Ю
	$[[DE]_j \dots A^\circ_k \dots C^\circ t_j]_i t_k B^\circ t_i$	(6d) Ю
	$\dots A^\circ_k \dots [DE]_j C^\circ t_j]_i t_k B^\circ t_i$	(6e) Ю

2.2. Unbounded Short Scrambling and Unbounded Long-Distance Scrambling of non-clitic elements

B1. Short & Unbounded Scrambling.

If the initial domain does not contain embedded structures, Short Unbounded Argument Scrambling may only arise due non-projective crossing of groups not involved in an immediate dominance relation, cf. (7). Such examples are rare.

(7) $[_x AB] \dots [_y CD] \text{ Ю } [_x [_y C_x \dots B] \dots _y D]$.

Sentences with disjoint constituents and embedding are slightly more acceptable than examples with non-projective crossing. Cf. Russian data (8a-c).

- (8) a. $[_x \text{Жители}^\circ \text{столицы}] [_y \text{любят}^\circ [_y \text{пивную продукцию}^\circ \text{Клина}]]$.
 Resident_{Nom.Pl.} capital_{Gen.Sg.} love beer_{AdjAcc.Sg.F.} production_{Acc.Sg.F.} Klin_{Gen.Sg.}
 “The residents of (our) capital love the beer production <from the city of> Klin”
- b. $^{??}[_y \text{Клина}]_i [_x \text{жители}^\circ \text{столицы}] [_y \text{любят}^\circ [_y \text{пивную продукцию}^\circ t_i]]$.
 Klin_{Gen.Sg.} resident_{Nom.Pl.} capital_{Gen.Sg.} love beer_{AdjAcc.Sg.F.} production_{Acc.Sg.F.}
- c. $*[_y \text{Клина}]_i [_x \text{столицы}]_j [_y \text{любят}^\circ [_y \text{пивную продукцию}^\circ t_i]] [_x \text{жители}^\circ t_j]$.
 Klin_{Gen.Sg.} capital_{Gen.Sg.} love beer_{AdjAcc.Sg.F.} production_{Acc.Sg.F.} resident_{Nom.Pl.}

If one cancels the requirement that the scrambled elements must represent one and the same sentence category or the requirement that they must be hierarchically independent, Short Unbounded Scrambling may be found in other constructions,

especially in constructions with second-position clitics splitting the initial constituent, as in the Old Russian examples (9a-b).

- (9) a. Old. Rus. а и-Суждальской {_{Scrambling} =*ти* (1) **земле** (2)} Новагорода не рядити (ГВНП, № 1, 1264 г.).
 And from Suzhdal_{Adj.Gen.Sg.F.} you_{2Dat.Sg.} land_{Gen.Sg.F.} Novgoroda_{Gen.Sg.M} not rule_{Inf}
 “And from Suzdal’s **land** (2), *you* (1) should not rule Novgorod”.
- b. а и-земле (1) {_{Scrambling} =*ти* (2) суждальской (2)} Новагорода не рядити}.
 And from **land**_{Gen.Sg.F.} you_{2Dat.Sg.} Suzhdal_{Adj.Gen.Sg.F.} Novgoroda_{Gen.Sg.M} not rule_{Inf}
- с. *а [и-Суждальской земле] =*ти*.

The Old Russian pronoun *ти* in (9) is a fixed position pronominal clitic that must be placed after the first stressed word form, cf. the ill-formedness of (9c), while the NP *земле* lacks a fixed position in a clause. But since the optional movement of just one category in the pair (...x, y...) ~ (...y, x...) is a sufficient condition of scrambling and the NP *земле* (x) may end up both the right and to the left from the clitic *ти* (y), nothing prevents from recognizing Short Unbounded Scrambling here. The scrambling domain in (9) is short — it includes only the clitic position and the position of the subsequent non-clitic element — while the clitic and the NP are linked with predicate heads of a different level⁵. One might theorize that clitics do not scramble with non-clitic elements but this stipulation lacks an independent verification since clitics do scramble with each other which is demonstrated in the next section.

3. Clitic classes and Scrambling

The term ‘clitic’ has many uses, cf. [Zwicky 1997], [Sadock 1995], [Зализняк 2008, 8], [Циммерлинг 2009]. Let us define [syntactic] clitics as prosodically deficient sentence categories linearized by syntactic mechanisms. In a Chomskyan framework, syntactic clitics may be analyzed either as heads (X°), cf. [Franks 2008], or as the so called left-branching elements i. e. reduced phrases (XP/X°), cf. [Bošković 2002]: the choice of the interpretation in the context of our paper is irrelevant. There are fixed position clitics and floating free clitics. Clitics can also be clusterizing i. e. capable of making up clitic clusters arranged in a rigid order or non-clusterizing i. e. not imposing any restrictions on contact position of two or more clitics. Fixed position clitics that do not move and do not make up clusters are of no interest for scrambling theories. Floating free non-clusterizing clitics scramble in the same way as non-clitic categories. Finally, if one accepts scrambling of clitic and non-clitic arguments

⁵ The NP *земле* in (9) is the complement of the PP [_{PP} *и(з) Суждальской земли*] which is dependant of the infinitival head *рядити* ‘to ordain’, while the dative clitic *ти* ‘you’ is the modal subject and may be viewed as an argument of the (zero) auxiliary head. Note that the infinitive *рядити* in (9) is not the head of an embedded clause but part of the main predicate.

in example (9) above, this type of scrambling patterns with scrambling of non-clitic elements: even if the clitic has a fixed position in a clause, as *mu* in (9), its relative placement respective to a non-clitic category still may be different, cf. variants (9a) and (9b).

Clusterizing clitics exhibit non-trivial features. Cross-linguistically, clusterization of clitics always takes place in some canonical syntactic position and may be blocked in other positions⁶. That means that clusterizing clitics are a subclass of fixed position clitics. At the same time, clusterizing clitics move, the whole clitic cluster may shift its location in a clause or be split in certain contexts; that means that some or all clusterizing clitics may occasionally end up outside their canonical position of clusterization [Зализняк 1993], [Циммерлинг 2009]. All Slavic languages except for Modern Russian, Modern Ukrainian and Modern Belorussian have clusterizing clitics [Dimitrova-Vulchanova 1999]. No Slavic language has phrase-level clusterizing clitics (in NPs or other non-predicative phrases⁷), cf. [Čavar, Wilder 1999], [Циммерлинг 2011]. In most cases Slavic languages put clitic clusters/ single clusterizing clitics after the first spelled-out constituent /first phonetic word⁸ or after the complementizer: main clauses vs subordinate clauses, finite clauses vs non-finite clause apply the same set of clusterizing clitics. These facts lead to the following generalization:

Slavic clusterizing clitics are clause-level second-position clitics (2P clitics).

The generalization (iii) holds for the following Slavic languages: Serbo-Croatian, Slovene, Czech, Slovak, Burgenland Croatian, Vojvodina Rusinsky, Old Novgorod Russian, Bulgarian. Bulgarian (and Macedonian) word order systems

⁶ This point is proved formally in [Циммерлинг 2011] and [Kosta, Zimmerling 2011]. The crucial fact is that in many world's languages one and the same clitic may clusterize on the clause level and be non-clusterizing on the phrase level. This is attested in Slavic languages where pronominal dative clitics, cf. Bulg. *mu* 1Dat.Sg. «me» clusterize as verbal arguments but do not clusterize as possessive markers on the DP-level. The same duality is characteristic of Ossetic dative-genitive pronouns: they clusterize only as verbal arguments on the clause level but not as possessive markers on the NP/DP level. This indicates that at least in languages of the Slavic/Ossetic type clusterizing capacity of a clitic is not an inherent lexical feature but a characteristics of the syntactic configuration.

⁷ The anonymous reviewer objects that the data of Modern Bulgarian might falsify my formulation. The checking of this claim is linked with the discussion about the so called Possessor Raising out of Bulgarian DPs: [Schürcks & Wunderlich 2004] argue that Bulgarian allows Raising of possessive datives out of DPs, while [Cinque & Krapova 2011] argue against a Raising analysis. Whatever view of Bulgarian DP is taken, the only candidates for the role of a clitic cluster in DPs are combinations of the definite article and the possessive pronoun, cf. Bulg. ужасни-те (1) *cu* (2) грешки lit. awful_{pl}.Det.Pl. (1) Refl.Poss (2) mistake_{pl}. (3) 'one's awful mistakes' ~ грешки-те (1) *cu* (2) ужасни (3) mistake_{pl}. Det.Pl. (1) Refl.Poss (2) awful_{pl}. (3) 'the same'. The enclitic definite article is attached to the first stressed word of DP, while the dative possessive pronoun is cliticized to the first element containing a definiteness morpheme. Hence, the Bulg. definite article is merged pre-syntactically on the morphological level, while Bulg. dative possessives are merged in syntax. Consequently, no clitic cluster arises: [_{DP} [ужасни-те (1)] = *cu* (2) грешки] ~ [_{DP} [грешки-те (1)] = *cu* (2) ужасни].

⁸ The exact formula of the first spelled-out constituent/first phonetic word variation is irrelevant for a scrambling analysis: in [Kosta, Zimmerling 2011], we address this issue in detail. Cf. also a general discussion in [Anderson 1995] and a case study of the 2nd position phenomena in Czech in [Avagustinova, Oliva 1997].

have a constraint on contact realization of clusterizing clitics and verbal forms. It has become customary to divide Slavic word order systems with clusterizing clitics into systems with clause-level 2P clitics and into systems with clause-level Verb-Adjacent clitics, cf. [Franks & King 2000], [Franks 2009]. This practice is justified but no analysis of the Bulgarian word order system can ignore the fact that this language retains a constraint on the number of groups preceding pronominal and auxiliary clitics. Cf. examples with a compound verbal form consisting of an I-participle and a BE-auxiliary in the past tense in (10): the compound form takes one position as shown in (10a) but a combination of a compound form with another constituent before the clitic *я* is excluded in whatever order as shown in (10b) and (10c):

- (10) a. Bulg. #[_{VP} купил бих]=я книгата.
 [bought_{PerfPart.Sg.M.} Be.Aux_{1Sg.Cond.}] she_{Acc.Sg.} book-the_{Acc.Sg.F.Def.}
 'I would rather buy this book', lit. '[bought would_{1Sg.}] = it the book',
- b. *[_{DP} Книгата] [_{VP} купил бих]=я,
 book-the_{Acc.Sg.F.Def.} [bought_{PerfPart.Sg.M.} Be.Aux_{1Sg.Cond.}] she_{Acc.Sg.}
- c. *[_{VP} купил бих] [_{DP} книгата]=я.

This gives a ground to state that the principle of 2P placement is not violated in Bulgarian, whatever the reason may be. Therefore, Bulgarian clusterizing pronouns and auxiliaries should be treated both as 2P clitics and as Verb-Adjacent clitics — cf. the ungrammatical order (10c) where the constraint of on clitic-and-verb adjacency is violated.

3.1. Clitic clusters and clusterizing clitics

Clitic clusters are by definition contact strings of clitics excluding permutation of elements and insertion of non-clitic words [Зализняк 1993: 289]. That means that if *a°*, *b°* and *c°* are clusterizing clitics and the fixed order of clitics is [_{Clitic Phrase} *a°*, *b°*, *c°*], no other order like * [_{Clitic Phrase} *b°*, *a°*, *t_i*, *c°*], * [_{Clitic Phrase} *c°*, *a°*, *b°*, *t_i*] should be possible in the canonical position of clusterisation. This amounts to saying that clusterizing clitics do not have short scrambling in sentences without cluster splitting. With cluster splitting orders as ...X°= [_{Clitic Phrase} *c°*] ...Y° [_{Clitic Phrase} *a°*, *b°*]... where the clitic *c°* is placed earlier than clitics *a°*, *b°* preceding it in the cluster may arise, if parts of the cluster are attached to different sentence categories. However, such cases are difficult to recognize as scrambling, since the clitic(s) leaving the clusterization position (or not reaching it) almost invariably end up in a position adjacent to a verbal head [Циммерлинг 2011]. I am assuming here that this is a special pattern of clitic movement that should be treated separately both from Short Scrambling and from Long-Distance Scrambling. A Clitic Template generating clitic clusters is illustrated by Old Novgorod data in fig. 3 below.

Fig. 3. Old Novgorod Russian clitic template

A					B		C
Particles					Pronouns		Present tense indicative BE-auxiliary
1	2	3	4	5	6	7	8 = AUX1
Affirm	Quest	Cause	Evid	Opt	Dative 1–2 p. (incl. Dat.Refl)	Accusative 1–3 p. (incl. Acc. Refl)	1–2 p. Sg.Du.Pl.
Že	Li	Bo	Ti	By	Mi, ti, si, ny, vy, na, va	M'a, t'a, s'a, ny, vy, na, va, i, ju, je, ě, ja	Jesm', jesi, jesme, jeste, jesvě, jesta

Cluster splitting is illustrated by the Old Russian example (11) where the alternative particle *ли* which precedes the auxiliary clitic *ecu* in the cluster ends up outside the clusterization position (2P) and is attached to the verbal head *слышалъ* '(you) heard'. On reasons specified above I do not treat such cases as scrambling and analyze them in terms of communicatively driven clitic movement: the initial topical PP *а у королева мужа* 'and from the king's man' has effect only on the surface position of *ли* but not on the surface position of *ecu*.

- (11) O. Russ. [BARRIER_a {TopicP A [pp **оу королева**]}=*ecu*^b мужа] слышалъ=*ли*^a
о томъ чстномъ крстѣ? (Ипат., under 1152 AC, list 166 rev.).
And from king's_{GEN.SG.} BE_{AUX.PRES.2SG.} man_{GEN.SG.} hear_{PRF.2SG.M.} Q about that_{LOC.SG.M.}
worthy_{LOC.SG.M.} cross_{LOC.SG.M.}

'Haven't you heard about that worthy cross from the king's man?'

A puzzling fact is that clusterizing clitics that lack options for short scrambling do allow extraction into a higher clause: the parameter responsible for extraction is known as Clitic Climbing. Most though not all Slavic languages have Clitic Climbing of argument and reflexive pronouns out of embedded non-finite clauses, while the so called Clitic Templates⁹ generating clitic clusters have slots for the clitics raised from embedded clauses [Franks & King 2000], [Kosta, Zimmerling 2011]. Clitic Climbing is a prerequisite of Clitic Scrambling but not its sufficient condition. Three different scenarios are possible:

- If the extraction is obligatory, no scrambling relation arises.
- If the extraction is optional and the extracted clitic has one and only one available target position in a higher clause, Clitic Climbing leads to a condition resembling or identical with Local Unbounded Scrambling.

⁹ The term 'Clitic Template' used in the Western tradition, cf. [Anderson 1995], [Franks & King 2000], [Browne 2008], [Kosta, Zimmerling 2011] corresponds to the term 'Ranking Rule' (Rus. *правило рангов клитик*) coined by Andrej Zaliznjak [Зализняк 1993] and adopted in [Циммерлинг 2008а], [Зализняк 2008], [Циммерлинг 2011].

- c) If the extraction is optional and the extracted clitic has multiple (more than one) target positions in a higher clause, Long-Distance Unbounded Scrambling arises.

Different Slavic languages show all these scenarios, as shown in fig. 4.

Fig. 4. Scrambling of clusterizing clitics in the Slavic languages

	A. Local Scrambling	B. Unbounded Scrambling
1. Short Scrambling	–	–
2. Long-Distance Scrambling	Clitic Climbing (+)	Clitic Scrambling +

In Slavic languages only argument and reflexive clitics climb into higher clauses. I am unaware of any examples of auxiliary and particle clitic climbing.

3.2. Clitic Climbing and Optional Movement

Let us examine Clitic Climbing first. In all Slavic languages except for Bulgarian and Macedonian clitic clusters have slots for clitic pronouns syntactically belonging to heads of embedded clauses. That means that e.g. a reflexive clitic dependent on an infinitival head must/may raise to a higher clause if the cluster has a slot for this category of clitics. In (12) clitics a, b, d belong syntactically to the head $v^{1\circ}$, located in the main clause (TP), while the clitic c^2 clusterizes with a^1 , b^1 , d^1 but belongs syntactically to the head $v^{2\circ}$, located in the embedded infinitival clause (IP)¹⁰.

(12) $[_{TP} \dots [_{CliticP} a^1 b^1 c_i^2 d^1] v^{1\circ}] [_{IP} v^{2\circ} t_i]$.

The pattern (11) is illustrated by the Rusinsky example (13), where clitics =*ue* and =*my* belong syntactically to the infinitive *поклонїцѣ*, while the clitic =*бу* belongs to the head of the main clause, the verb *пошол*.

(13) Rusin. *же=бу*¹=*{=ue*²=*my*² }_i и я *пошол*⁰¹ [_{IP} *поклонїцѣ*⁰² *t*_i]. (Mat. 2.8).¹¹
That Cond.Pcl Refl.Pcl. him_{3Dat.Sg.M.} and I_{1Nom.Sg.} go_{1Sg.Pst.} bow_{Inf.}
Lit. ‘that=*Pcl*¹=*{=REFL*²=*to-him*² } and I *went*⁰¹ to bow.low.⁰²’.

¹⁰ The tag CliticP in (12) indicates that the clitic cluster $a^1 b^1 c_i^2 d^1$ is a phrase (clitic group). The tag TP (Tense Phrase) stands for a finite clause, its boundaries being marked with brackets. The tag IP stands for a non-finite clause headed by an infinitive or participle. The finite verbal head of TP is marked in (12) as v^1 , the non-finite verbal head of IP is marked as v^2 . The uppercase indexes $a^1 b^1 c_i^2 d^1$ indicate to which of the two verbal heads— v^1 or v^2 — each clitic belong. The lowercase index c_i^2 indicates that the clitic *c* syntactically belonging to the head v^2 , has been raised into the main clause by Clitic Climbing. The symbol t_i marks the initial placement of this clitic before Clitic Climbing took place.

¹¹ The examples are from [Browne 2008].

The structure (12) conforms to the definition of Local Long-Distance Scrambling: scrambling in the initial domain, no scrambling in the final movement domain. But since Clitic Climbing is obligatory in Rusinsky, the example (13) does not exhibit scrambling. The linear variants (where the clitics do not climb (14a) or do not reach the clusterization position in the main clause (14b) are ill-formed.

(14) a. Rusin. **же=би_i и я пошол поклонїц=ше=му*.

b. Rusin. **же=би и я пошол=ше=му поклонїц*.

Clitic Climbing is obligatory in the Croatian variety of Serbo-Croatian [Čavar, Wilder 1999: 447] and in most other literary Slavic languages. Nevertheless, Slavic idioms with optional Clitic Climbing exist. Zaliznjak [Зализняк 1993: 295–296] discusses Old Novgorod Russian usage of the XIV–XV centuries, where the reflexive clitic *ся* normally did not climb. Sentences with the climbing of *ся* are however attested, cf. the authentic example (15a). The standard option is shown in (15b).

(15) a. Old Novg. а холоп и роба не оучноу^т = с_я_i [_{IP} тяга^т t_i] (a XV century copy from a 1396 letter)¹².

And servant_{Nom.Sg.M.} and bondmaid_{Nom.Sg.F.} not start_{3Pl.Pres.} Refl. litigate_{Inf.}
 «And (if) a servant and a bondmaid do not start litigating».

b. а холоп и роба не оучноут [_{IP} тягать=с_я].

And servant_{Nom.Sg.M.} and bondmaid_{Nom.Sg.F.} not start_{3Pl.Pres.} litigate_{Inf.} Refl.

3.3. Long-Distance Unbounded Clitic Scrambling

This type of Clitic Scrambling requires a combination of two non-trivial parametric settings — 1) Clitic Climbing should be optional, not obligatory; 2) clusterizing clitics extracted from an embedded clause should have more than one target position in a higher domain. Previous accounts of Clitic Climbing took for granted that this combination is excluded and Clitic Scrambling was ignored, but F. Marušić [Marušić 2007] found it in Modern Slovene. According to him, each verbal head mediating between the main clause verb and the head of the embedded infinitival clause may attract the extracted clitics in Slovene. In (16a–f) it is the pronominal clitic =*jo* «her».

(16) a. Slov. [_S { SCRAMBLING On=*jo*²_i =*je*¹ hotel^{1o} [_{IP} nehati^o [_{IP} hoteti^o [_{IP} videvati^o t_i vsak dan]]]]].

He_{3Nom.Sg.M.} her_{3Acc.Sg.F.} BE_{Aux.3Sg.Pres.} want_{3Sg.Pst.} not.want_{Inf.} want_{Inf.} see_{Inf.} every day
 “He wanted to stop wanting to see her every day”.

Lit. ‘he=**her**=**BE.AUX** wanted to stop to want to see her every day’.

¹² The example is from [Зализняк 1993: 296].

- b. [_S {_{SCRAMBLING} On=**je**¹#=**jo**² hotel° [_{IP} nehati° [_{IP} hoteti° [_{IP} videvati° t_i vsak dan]]}]]].
- c. [_S {_{SCRAMBLING} On=**je**¹ hotel°# =**jo**² [_{IP} nehati° [_{IP} hoteti° [_{IP} videvati° t_i vsak dan]] }]].
- d. [_S {_{SCRAMBLING} On=**je**¹ hotel° [_{IP} nehati#=**jo**² [_{IP} hoteti° [_{IP} videvati° t_i vsak dan]] }]].
- e. [_S {_{SCRAMBLING} On=**je**¹ hotel° [_{IP} nehati° [_{IP} hoteti°#=**jo**² [_{IP} videvati° t_i vsak dan]] }]].
- f. [_S {_{SCRAMBLING} On=**je**¹ hotel° [_{IP} nehati° [_{IP} hoteti° [_{IP} videvati°=**jo**² vsak dan]] }]].

Marušić himself does not use the term ‘Scrambling’ for the examples (16a-f) but his Slovene data clearly demonstrate Long-Distance Unbounded Clitic Scrambling: the clusterizing clitics in (16a-f) initially belong to different verbal heads but scramble in the final domain i. e. S. Other Slavic languages lack Long-Distance Unbounded Clitic Scrambling. Slovene data prove that it is a possible but not typical linearization strategy for clusterizing clitics, while the same scrambling type is more common for Slavic non-clitic elements.

4. Conclusion

The account of a scrambling theory outlined here demonstrates that scrambling in pairs of sentence categories (x, y) may be effectively triggered by optional movement of one of these categories. Two pairs of parameters — local/unbounded scrambling and short/long-distance scrambling give rise to four scrambling types all of which are attested in Slavic languages. Local vs Unbounded Scrambling are opposed by the final movement domains, Short vs Long-Distance Scrambling — by the initial movement domains. The combination of Short and Long-Distance Scrambling is rare but theoretically not excluded since the final movement domain with Long-Distance Scrambling may be smaller than a single clause. Clusterizing clitics have more reduced scrambling possibilities than non-clitic sentence categories. They do not have Short Scrambling but may under certain conditions have Long-Distance Scrambling. The movement domains for elements of this class must be checked in positions where the raised clitics clusterize with other clitics, not in positions where they are base-generated. The movement pattern known as Clitic Climbing requires or allows for a clitic generated in an embedded clause to raise and reach its canonical position in a higher clause. If the raised clitic has exactly one position in a higher clause, Local Long-Distance Scrambling arises. If the raised clitic has two or more available positions in a higher clause / clauses, Unbounded Long-Distance Scrambling arises.

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