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## PREPOSITIONS AND NATURAL PHENOMENA: A CONTRASTIVE STUDY OF SERBIAN, FRENCH AND GREEK<sup>1</sup>

In this paper we analyze the usage of the prepositions *po*, *na* and *u* in Serbian, both in the spatial and the more abstract domain of so-called “natural phenomena”. We show that the difference in their semantics is conceptually based on two basic cognitive oppositions: the contact - containment and the mass-count oppositions. In the contrastive part of our work we compare the Serbian data with their equivalents in French and English.

**Key words:** preposition, mass, count, discrete, space, time, contrastive analysis

### **1. Introduction**

According to the well known Localistic Hypothesis (Lyons: 1977, 718) spatial expressions are semantically and grammatically fundamental. In other words, the non-spatial expressions are derived from words that describe space and spatial relations<sup>2</sup>. In this work we examine a quite interesting linguistic phenomenon related to the above mention hypothesis: the fact that in Serbian some spatial expressions (prepositions), denoting the opposition *continuity* – *discreetness* and the opposition *being connected* – *being inside* may also be used in the temporal domain. More precisely, we will examine the specific spatial and temporal usages of the prepositions *po*, *na* and *u* and their equivalents in French and Greek.

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1 Our deepest thanks go to Stavroula and Kostas Katsanos and our colleague dr Predrag Mutavdžić for their precious help with Greek data.

2 Already in the 19th century German philologists suggested that spatial meanings seem to be basic and that prepositions initially indicated spatial perception. Thus, a famous German nineteenth century comparativist Franz Bopp, in his study of Sanskrit (1833, 136), indicated that case endings' relations were originally spatial but were extended from space to time and cause.

## 2. The *po – na – u* phenomenon

### 2.1 *The linguistic expression of fundamental spatial relations*

Most research in linguistics, psychology and philosophy has shown that in the domain of space two relations can be seen as fundamental: a *contact – support* relation and a relation of *containment*. In most languages they are represented by two spatial prepositions, approximately equivalent to *on* and *in* in English. They can be easily defined using mereotopological<sup>3</sup> or topological predicates (Casati & Varzi: 1999). For example for the preposition *na* (*on*) we suggest the following definition:

$$ON : xony =_{df} WCxy$$

(*x on y is equal by definition to x is in weak contact with y*)

Evidently, the above quoted definition is based on the topological notion “weak contact“ (probably the prototype of *contact*, see Aurnague, Vieu & Borillo: 1997) defined in the following way by Casati and Varzi (1999):

$$WCxy =_{df} \neg Cxy \wedge Cx(c(n^4y))$$

(*x is weak contact with y is equal by definition to x is not connected to y and x is connected to the closure of the neighborhood of y<sup>1</sup>*)

Visibly, in this definition we have avoided the notion of verticality (*x on y* means that *x* is higher than *y*). It follows that the preposition *on* is a purely topological preposition and that whether the figure is actually higher than the ground<sup>5</sup> is purely a matter of contextual inferences, that we derive from the pragmatic context of utterances (see Sperber & Wilson, 1986). It is important to emphasize that only with this kind of definition it is possible to explain the temporal usages (and other non-standard usages) of the preposition *on*.

For the preposition *in* we can use the mereotopological relation *internal part*, based on two predicates (*parthood* and *connectednes*):  $IPxy =_{df} Pxy \wedge \forall z(Czx \rightarrow Ozy)$ . So *x* is in *y* iff *x* is a part of *y* and there is *z* such that if *z* is connected to *x* there is an overlap between *z* and *y*. However this formula is not sufficient in every case. For three-dimen-

3 Mereotopology is a combination of mereology (a theory about parthood relations) and topology (a theory about basic spatial and neighborhood relations).

4 *n* is neighborhood operator.

5 The figure is moving or concept movable entity whose site, path or orientation is conceived as a variable the particular value of which is the relevant issue. The ground is a reference entity, one that has a stationary setting relative to a reference frame, with respect to which the figure's site, path or orientation is characterized (Talmy, 2000, 184)

sional objects we need the notion of a *hole* and the idea of three different types of locations: total, partial and generic. That is how we get:  $IN_{xy} = df \ E_z(Hzy \ \& \ RLxz)$ . H stands for *hole*, E is enclosure, L is location and R is every kind of location modifiers<sup>6</sup>. In other words: *x* is in *y* if *x* is region-located with a hole in *y* (Casati & Varzi: 1999, 142).

## 2.2 The situation in Serbian – spatial relations

In some languages the concept of contact – support involves one additional dimension, a distinction between *mass* and *count entities* that concerns the nature of a figure. That is how instead of one preposition we get two. For example in Serbian, for the relation *contact – support* two different prepositions are used:

a) *po* (similar to the English preposition *over*) is used when the figure is a continuous substance<sup>7</sup>, or a multitude of objects viewed as a mass:

1) Dušan je prosuo kafu *po* stolu.  
Dušan has spilt coffee over table  
*Dušan has spilt some coffee on the table.*

2) Mnoštvo pahuljica joj je popadalo *po* kosi.  
Multitude snow flakes her have fallen over hair.  
*Many snow flakes have fallen on her hair.*

b) *na* (*on*) is used when the figure is a discrete object or a group of discrete objects:

3) Velika šolja kafe je *na* stolu.  
Big mug coffee is on table  
*A big mug of coffee is on the table.*

4) Tri šolje kafe su *na* stolu.  
Three mugs coffee are on table  
*Three mugs of coffee are on the table.*

For the relation of *containment* the preposition *u* (*in*) is used in all the above presented cases, so the nature of figure is not taken into account:

5) Voda je *u* čaši.  
Water is in glass.

<sup>6</sup> Location modifiers define the type of location: total, partial or generic.

<sup>7</sup> *Mass entities* are continuous, visible and homogeneous substances, while *count entities* are discrete, bounded, indivisible and individuated objects (Jackendoff, 1996, Ašić, 2004).

*Water is in a glass. / There is some water in a glass.*

- 6) Tvoja knjiga je u fioci.  
Your book is in drawer.  
*Your book is in a drawer.*

### 2.3 *The po-na-u opposition in the temporal domain*

Interestingly, in Serbian, the *po* – *na* – *u* opposition exists in the non-spatial domain: it is used on the one hand, to express the distinction between spatially dynamic and spatially static verbs, and on the other, to express the difference between effective and non-effective natural phenomena. Let us define these notions. Spatially dynamic verbs denote activities or events<sup>8</sup> that involve a linear movement in space (a displacement), like running or walking. In the case of spatially static verbs no such movement exists: examples of this are sleeping or crying.

As for natural phenomena (Ivić: 1995), they are effective if we consider them as acting on us or changing our environment—that is, if they are intrinsically dynamic, like *rain, which is falling* or *the sun, which is shining* or *wind, which is blowing*. The non-effective natural phenomena do not act; they simply depict physical characteristics of the environment in which an activity is taking place. Examples of the latter are *shadow, shade, darkness, light*.

The rules that emerged from our observation of a representative number of examples in Serbian are:

I) With spatially dynamic verbs, *po* is used in both instances, for effective and non-effective natural phenomena:

- 7) Dušan trči *po* suncu.  
Dušan runs over sun.  
*Dušan is running in the sun.*
- 8) Dušan hoda *po* hladu velikog baobab drveta.  
Dušan is walking over shade large baobab tree (gen. case).  
*Dušan is walking in the shade of the large baobab tree.*

IIa) With spatially static verbs, *na* is used only with the effective phenomena:

- 9) Dušan spava *na* suncu.  
Dušan sleeps on sun.  
*Dušan is sleeping in the sun.*

IIb) However, with the non-effective phenomena, *u* is obligatory:

8 We refer here to the taxonomy of Vendler (Vendler, 1957).

- 10) Dušan spava *u* hladu velikog baobab drveta.  
 Dušan is sleeping in shade large baobab tree (gen. case).  
*Dušan is sleeping in the shade of the large baobab tree.*

It follows that, in the case of spatially static verbs, the relation between activity and meteorological conditions in which they develop has a feature of being discrete, while in the case of spatially dynamic verbs, this relation has a feature of being continuous. There must be, therefore, some conceptual link between movement and continuousness. Movement is associated with the absence of boundaries. On the other hand, the notion of being static is coupled with discreteness. The remainder of the notion of an individual object is associated with the existence of boundaries. As for the relation of containment, it imposes identical rules in the spatial and temporal domain.

### 3. The situation in French

Let us consider the equivalents of the Serbian examples illustrating the *po-na-u* opposition in French:

- 11) Le garçon court au<sup>9</sup> soleil.  
*The boy is running in the sun.*
- 12) Le garçon est étendu au soleil.  
*The boy is lying in (under) the sun.*
- 13) Le garçon court dans l'ombre.  
*The boy is running in the shade*
- 14) Le garçon est étendu dans l'ombre.  
*A boy is lying in the shade.*

It is clear that the French language does not mark a difference between spatially dynamic and spatially static verbs, for in both cases (with *courir* and *être étendu*) the same preposition (*à*) is used. This preposition is semantically more neutral than the preposition *sur(on)* in French, it just communicates that two entities are somehow (more physically and then conceptually) connected. Its semantics could be based on the topological (see Casati & Varzi, 1999) relation of extremely weak contact (see Ašić, 2007):

$EWC_{xy} =_{df} \neg Cxy \wedge ECx(c(ny))$  (*x is in extremely weak contact with y is equal by definition to x is not connected with y and x is externally connected with the closure of the neighborhood of y*).

<sup>9</sup> *Au* is a contracted form consisting of the preposition *à* and definite article.

As for the difference between effective and non effective phenomena it is linguistically expressed in French. Just like in Serbian non-effective phenomena are seen as containers and the preposition *dans (in)*<sup>10</sup> is used, while effective phenomena behave like entities in which their non-spatial (abstract) characteristics prevail.

15) Le garçon est à l'école.

*The boy is at school.*

This example needs an explanation: the noun *school* can be seen as a kind of conceptually complex “dot“ object (see Pustejovsky, 1995) that refer to several things: a) a (material) building (*The school is empty*), b) a social institution (*Every child has to go to school*) or c) the concept of learning (*This experience is going to be a good school to you*). With this type of nouns, in French typically the preposition *à* is used because it accentuates the abstract side of their nature.

#### 4. The situation in Greek

In this section we will see if the Greek language is sensitive to the conceptual oppositions that have been discussed so far:

16) To pedi trehi **ston** ilio.

The boy runs IS+the sun

*The boy is running in the sun.*

17) To pedi trehi **sto** krio

The boy runs IS+the shade

*The boy is running in the shade*

18) To pedi ksaplioni **ston** ilio

The boy lies IS + the sun

*The boy is lying in (under) the sun.*

19) To pedi ksaplioni **sto** krio

The boy lies IS+the shade

*A boy is lying in the shade.*

In all the above presented cases the same preposition **is** is used - actually the combination of the preposition *is* (demanding the accusative case) and the definite article (*to*)<sup>11</sup>. The semantics of the preposition *is*, just like the semantics of *à* in French could be based on the relation of extremely weak contact. Moreover, the fact that *IS* in examples like 17)

<sup>10</sup> In French *dans* is typically used for the relation of containment: *Le stylo est dans la boîte* (*The pen is in the box*).

<sup>11</sup> *Sto=is+to*

and 19) (with non-effective phenomena that are typically seen as containers) suggest that this preposition might also denote the relation of containment. If this is true the Greek language would be one of the rare languages that do not linguistically mark the difference between two absolutely basic spatial concepts: “being connected“ and “being inside“!

In order to check this, let us consider some more examples in which grounds are prototypical spatial objects:

- 20) To molivi ine mesa sto kuti.  
 The pencil is inside IS+THE box  
*The pencil is in the box.*

The example 20) denotes a classic case of the relation of containment. Yet the preposition *is* is used. However the instruction given by the preposition *is* is enriched here with the semantics of the adverb *mesa* (*inside*). This means that though Greek doesn't possess a special preposition designating containment, it exhibits a need to mark and underline this relation. Thus, with the same entity playing a role of a ground (as shown by the examples 21 and 22) we can have either *sto* or *mesa sto* depending on which aspect of the entity we want to insist:

- 21) To pedi ine sto sholia  
 The boy is IS+the school  
*The boy is at school.*
- 22) To pedi ine mesa sto sholia  
 The boy is inside IS+the school  
*The boy is in the school building.*

In 21 a speaker just wants to communicate that the boy has gone to school (21 is true even if the boy is in the school yard) and that he is somehow conceptually connected to it (for instance he has gone to school to learn or to play with his friends), while for 22 to be true the boy has to be inside the school building.

Naturally in most cases when one would use *at* in English and *à* in French (when the accent is not on the physical inclusion but on the conceptual connection between two entities) there would be inappropriate to use *mesa+ is* in Greek:

- 23) O fititis ine sto panepistemio.  
 The student is IS+the university  
*The student is at the university.*
- 23) Ego ime sto spiti mu.  
 I am IS+the home mine  
*I am at home.*

Interestingly, *sto* alone can be used even with grounds that do not possess all the typical characteristics of containers (strict boundaries and a well defined hole inside) but are usually seen as containers<sup>12</sup>:

- 23) To pedi kathete sto dasos  
 The boy is sitting IS+ the forest  
*he boy is sitting in the forest.*

To sum up, since non effective phenomena are not real physical objects in which something can be put in, it is natural to use in Greek the preposition *is* alone (not enriched with *mesa*) with them.

### 5. Final remarks

The fact that in Serbian different prepositions are used to express the difference between a) spatially static and spatially dynamic entities and b) effective and non-effective natural events is most probably linked to the fact that this Slavic language does not possess a semantically neutral preposition denoting a mere conceptual connection between two entities. Given that in French such a preposition exists, it is not surprising that it is used with grounds referring to meteorological phenomena. Interestingly, non effective phenomena are seen as containers and their more “material“ nature is emphasized by the usage of the preposition *dans* (*in*).

The situation in Greek is even more straightforward: since in this language there is no specific preposition for the relation of containment, the preposition *is* is used in all the cases.

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<sup>12</sup> We say respectively in English, French and Serbian: *The boy is in the forest. Le garçon est dans la forêt. Dečak je u šumi.*



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## **PREDLOZI I PRIRODNE POJAVE: KONTRASTIVNA ANALIZA SRPSKOG, FRANCUSKOG I GRČKOG JEZIKA**

Rezime

U ovom radu analiziramo prostorne i vremenske upotrebe predloga *po*, *na* i *u* u srpskom jeziku i njihove ekvivalente u francuskom i grčkom jeziku. Pokazujemo da se semantika ovih predloga zasniva na osnovnim spacijalnim odnosima „kontakt“ i „sadržavanje“, a da se ograničenja koja oni postavljaju na prirodu objekta lokalizacije i lokalizatora mogu objasniti konceptualnom opozicijom „diskretno – kontinuirano“.