JOURNAL of SLAVIC LINGUISTICS

VOLUME 30 · ISSUE NO. FASL 29 EXTRA ISSUE

Se middles in the evolution of predication: Is Serbian a split-accusative language?

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ABSTRACT

This paper builds on the proposal that human languages reconstruct back to an intransitive (one argument) absolutive-like grammar. Such grammars are arguably still found in a variety of constructions across languages, including in verb-noun compounds in e.g. English and Serbian, and in Serbian *se* "middles." Given the highly productive nature of *se* middles in Serbian, and given their specialization for low elaboration of events, and for the inanimate end of the Animacy Hierarchy, the proposal is that Serbian is best analyzed as a split-accusative language, on analogy with split-ergative languages, in that its dominant/default grammar is accusative, but the absolutive grammar (ergativity) occupies a significant niche.

KEYWORDS language evolution · middles · ergativity · thematic underspecification

1 INTRODUCTION

In a nutshell, my proposal regarding the evolution of language is that human grammars reconstruct back to an intransitive (one argument) absolutive-like stage (Progovac 2015b, 2016, 2019, and references there). This proposal is based both on an internal reconstruction using syntactic theory, and on comparative typological evidence, in an attempt to directly bring together formal, typological, and evolutionary considerations (including genetic and neuroscientific). It is specific enough to generate testable hypotheses, e.g. for neuroimaging experiments (Progovac et al. 2018a,b). It also successfully cross-fertilizes with the recent Self-Domestication Hypothesis (SDH) of human origins, in that it postulates a mutually reinforcing feedback loop between reconstructed proto-grammars with their great utility for e.g. insult/verbal aggression, and the gradual reduction in reactive physical aggression, the centerpiece of the SDH (Progovac & Benítez-Burraco 2019, Benítez-Burraco & Progovac 2021).

The linguistic reconstruction is based upon the postulated (partial) skeleton of the modern sentence (1), widely adopted in Minimalism (and predecessors), at least in languages like English (e.g. Chomsky 1995 and later work; Adger 2003):

(1) CP > TP > vP > SC/VP

The bottom layer is a Small Clause/Verb Phrase (SC/VP), which typically accommodates a verb and only one argument. On top of SC/VP is the "little v" phrase (vP), an additional verbal layer of structure, which supports transitivity (i.e. the addition of another argument). The TP (Tense Phrase) layer projects on top of the vP, accommodating the expression of tense and finiteness, and the CP layer is responsible for subordination, question formation, etc. The theoretical construct in (1) offers a precise and straightforward method of (internally) reconstructing the initial syntactic stage(s) in evolution (for details, see Progovac 2015b):

(2) Structure X is considered to be (evolutionarily) primary relative to Structure Y if X can be composed independently of Y, but Y can only be built upon the foundation of X.

While SCs/VPs can be composed without a vP (transitivity) layer, the vP and TP can only be built upon the foundation of a SC/VP. One can thus reconstruct a vP-less and TP-less (intransitive and tenseless) small clause stage in the evolution of language. This one-argument small-clause grammar would also be absolutive-like, in the sense that it would not have grammatical means for distinguishing subjects from objects, or agents from patients.

The approximations/proxies of such absolutive one-argument grammars can be found in various constructions across languages, including (i) in absolutives in ergative languages; (ii) in verb-noun compounds in some accusative languages, and, most relevant for this paper (iii) in Serbian *se* "middles."[1] Postulating first the absolutive basis of *se* middles, which are productive and common in Serbian, I will argue that Serbian is best analyzed as a split-accusative language, on analogy with split-ergative languages, especially considering the specialization of *se* middles for low elaboration of events, and for the inanimate end of the Animacy Hierarchy.[2] As will be discussed, those alignment splits in ergative languages that are sensitive to animacy (see e.g. Comrie 1978) often exhibit the opposite, complementary patterns. In other words, while I have used syntactic theory to reconstruct the initial stage(s) of language evolution (1)–(2), in this paper, I am using this evolutionary dimension in order to provide a more explanatory, and more empirically grounded syntactic analysis of predication in Serbian, one that appeals to two distinct types of grammars in close interaction and competition.

2 THE ABSOLUTIVE GRAMMAR (ERGATIVITY) IN SERBIAN

2.1 INTRODUCING ABSOLUTIVE GRAMMARS

Let us first introduce ergativity by looking at a syntactically ergative language, Tongan. The following example from Tongan (3) illustrates the one-argument absolutive grammar, in which the only argument is not specified as either a subject/agent or object/patient, as reflected in two distinct translations. The only argument (Mary) can be seen as simply a participant in the event, as per the semantic representation in (4).

(3) Oku ui ʻa Mele
PRES call ABS Mary
'Mary calls.' / 'Mary is called.' (Tongan, Tchekhoff 1973, 283)

(4) $\exists e$ [C(e) $\wedge$ Participant (Mary,e)]

This analysis draws on Tchekhoff's (1973, 283) insistence that Mary in (3) is neither an agent nor a theme, and that the two translations of (3) just reflect a nominative-accusative bias. In (3) "Mary is the only determiner [i.e. argument, LP], and the whole utterance gives us only the following information: present tense, verb call, Mary..." Tchekhoff further points out that it would be erroneous to analyze the two interpretations in (3) from Tongan as involving two distinct syntactic structures. The only reason for this kind of approach would be to facilitate their analysis (and translation) in a theoretical framework designed for nominative-accusative languages. Absolutive agents and absolutive themes/patients in Tongan are clearly unified grammatically into a single, absolutive role in intransitive sentences.

[1] For the idea of syntactic fossils, i.e. proxies of early stages of human grammar, see e.g. Jackendoff (1999, 2002).

[2] In this paper, my claims only pertain to *se* middles in Serbian, and not necessarily to related uses of *se* in other Slavic languages, or in Romance languages, where *se* may have specialized for other functions. Each language would have to be examined in its own right.

Upon this (thematically unspecified) absolutive layer in (3) one can add, optionally, on top, an ergative second (higher) argument (5), which then results in an unambiguous interpretation of the ergative argument as agent, and the absolutive argument as non-agent, i.e. theme/patient. A possible semantic analysis of (5) is given in (6), where Mary can still keep its participant role; in fact, the absolutive role in syntactically ergative languages often keeps certain subject-like properties even in the presence of the higher, ergative argument (see e.g. Dixon 1994).[3]

(5) Oku ui ʻe Sione ʻa Mele
PRES call ERG John ABS Mary
'John calls Mary.'

(6) $\exists e$ [C(e) $\wedge$ Agent (John,e) $\wedge$ Participant (Mary,e)]

Tongan's grammar is thus based on first argument vs. second argument distinction, rather than on subject vs. object distinction, so salient in accusative languages. This observation will also prove relevant for the discussion of the dependent case theory, introduced below. In this respect, the addition of the ergative argument (i.e. the introduction of a transitive grammar) has a clear communicative advantage over the one-argument grammar, in its explicitness, i.e. reduction in ambiguity/vagueness.

With rare exceptions, transitive structures across languages typically add only one extra piece to the postulated absolutive-like foundation, whether it is on top (ergative) or on the bottom (accusative), and serial verb patterns tend to string together a limited number of (small) clauses, often just two (see e.g. Progovac 2015b, 2016, and references there, for a more detailed discussion). Needless to say, this characterization of cross-linguistic variation in transitivity is in broad strokes only. Even a cursory look at e.g. English and Serbian, both traditionally classified as accusative languages, reveals a lot of difference in detail and analysis, and a lot of complexity (e.g. Progovac 2013). The same is true of ergative (e.g. Aldridge 2008) and serial verb patterns (e.g. Aboh 2009) across languages, as well as of active-stative patterns (Mithun 1991). Nonetheless, this reconstructed minimal grammar can still be postulated as the baseline point, the common denominator, defining the limits and restricting the possibilities for cross-linguistic, as well as intra-linguistic variation.

Importantly, the (additive) characterization of ergative and accusative cases is well aligned with Dependent Case Theory (e.g. Yip et al. 1987, Marantz 1991, McFadden 2004, Baker & Vinokurova 2010, Baker 2015), as well as with Tchekhoff's (1973) characterization of ergativity in Tongan, summarized above, where the absolutive is seen as the first (or only) argument, and the ergative as the second (added) argument. According to Marantz (1991, 24), " 'dependent' case is what we will call accusative and ergative ... Acc is the name for the dependent case that is assigned downward to an NP position ... Erg is the name for the dependent case assigned upward to the subject position." In other words, accusative and ergative cases are dependent on the presence of another (first) argument, making it plausible to reconstruct that first argument as the only argument in the ancestral grammar, that is, as the beginnings of predication. The first argument is also typically unmarked, or at least less marked than the second argument.

As pointed out above, the addition of the second argument (i.e. the introduction of a transitive grammar), whether ergative or accusative, has a clear communicative advantage over the one-argument grammar, in its explicitness, significantly reducing

[3]As shown in (i), in Dyirbal, an ergative language, the absolutive, even in the presence of an ergative, still controls coordination (Dixon 1994, 155). In this sense, the absolutive is acting in a "subject-like fashion," i.e. in a way that subjects would act in an accusative language.

(i) nguma yabu-nggu buran banaganyu
father.ABS mother-ERG saw return
'Mother saw father and (father) returned.'

ambiguity/vagueness. But there are certainly also situations where such explicit, transitive grammars are an overkill, e.g. in the case of inanimates,[4] or in the case of low elaboration of events associated with e.g. reflexivity, reciprocality, anticausativity, as well as with other cases where there is no explicit specification of causation and/or agency.[5] This is where Tongan prefers a one-argument, absolutive grammar, and this is arguably also where an accusative language may utilize its own version of an absolutive-type grammar, such as the kind of grammar found in middles. The following two subsections introduce two basic types of approximations/proxies of absolutive-based one-argument grammar in Serbian, a predominantly accusative language: *se* middles §2.2 and verb-noun compounds (§2.3). As will be explained, it is the grammar behind middles that builds the strongest case for the split alignment status of Serbian. At the same time, verb-noun compounds provide the best approximations of the ancestral grammar, providing further plausibility for this approach.

2.2 *SE* MIDDLES IN SERBIAN ARE ABSOLUTIVE-BASED

Serbian *se* "middles" have been analyzed as vague, vP-less, absolutive-like structures in e.g. Progovac (2015b,a).[6] In this view, the middle *se* constructions in Serbian, and middles more generally, are seen as ambivalent structures, straddling the boundary between transitivity and intransitivity, passive and active, ergativity and accusativity. According to e.g. Kemmer (1994, 181), "the reflexive and the middle can be situated as semantic categories intermediate in transitivity between one-participant and two-participant events."[7]

Where pragmatics allows, a wide variety of interpretations is possible with *se* middles (7) and (9), encompassing reflexive, reciprocal, null object, and passive-like readings, warranting an underspecified semantic analysis such as the one proposed in (8) and (10), on a par with the analysis offered for Tongan absolutives in the previous section (3) and (4).[8]

(7) Deca se udaraju/grle.
children.NOM SE hit/hug.3PL
'The children are hitting/hugging each other.' (reciprocal interpretation)
? 'The children are hitting/hugging themselves.' (reflexive interpretation)
'The children are hitting/hugging somebody (else.)' (null object interpretation)
'One spanks/hugs children.' (passive-like interpretation)

[4]For example, short of some fairytale setting, expressions such as 'yam eat' can only be interpreted as yam instantiating a theme role, rather than agent role; as noted in Tchekhoff (1973, 285), "a yam cannot eat any more than a box can dig a hole."

[5]In this sense, (i) below can be considered as an example of low elaboration of events, not specifying if there was an agent, or who the agent was, in contrast to (ii), where there is such specification. See also Kemmer's 1994 characterization of middles in the next section.

(i) Vrata su se otvorila.
door AUX SE opened
'The door opened.'

(ii) On je otvorio vrata.
he AUX opened door
'He opened the door.'

[6]Some previous characterizations of *se* in Serbian treat it as some sort of grammatical (expletive/ meaningless) element (e.g. Franks 1995, Progovac 2005a); the reader is also referred to an extensive discussion of *se* middles in Marelj (2004).

[7]Kemmer (1994, 184) also points out that middle systems are quite widespread, being found in a large number of genetically and areally divergent languages.

[8]The reader is referred to Dowty's (1991) idea of proto-roles, where proto-agents and proto-patients are considered to be on the volitional/affected continuum. This characterization of thematic roles can accommodate availability of a general proto-participant role.

(8) $\exists e$ [H(e) $\wedge$ Participant (Children, e)]

(9) Žene se vide.
women.NOM SE see.3PL
? '(The) women see themselves.' (reflexive interpretation)
'(The) women see each other.' (reciprocal interpretation)
'One can see (the) women.' (passive-like interpretation)

(10) $\exists e$ [S(e) $\wedge$ Participant (Women,e)]

There are explicit strategies in Serbian for reflexive (sebe), reciprocal (jedni druge), and passive interpretations (11) to (13), none of which involves *se*; yet *se* can potentially express any of them, subject to pragmatic plausibility.[9] Moreover, the specialized strategies below are not vague, but rather explicit as to the thematic role of the subject, clearly a product of an accusative grammar. As will also be illustrated below, while explicit strategies are largely self-sufficient with respect to the thematic interpretation, the vague middle structures are highly dependent on pragmatics for their interpretation.

(11) Žene vide sebe. (explicit reflexive strategy)
women see themselves
'Women see themselves.'

(12) Žene vide jedna drugu. (explicit reciprocal strategy)
women see one other
'Women see each other.'

(13) Žene su vidjene. (explicit passive strategy)
women AUX seen
'Women were seen.'

In Pre- and Proto-Indo-European, the so-called middles/mediopassives seem to predate the grammaticalization of e.g. specialized passive forms (Kulikov & Lavidas 2013, e.g.). Such middle forms in ancient Indo-European languages also feature reflexive, passive-like, reciprocal, and anti-causative uses. This wide range of uses is still there in Serbian, in spite of the existence of specialized strategies, and very often the only available choice, or the only natural choice, is in fact the middle form.[10]

[9]A reviewer brings up the following example with long-distance extraction of the object, which has only passive-like interpretation, although it involves *se* (i).

(i) Takve odluke su se pokušale preinačiti.
those decisions are SE tried change.INF
'Someone/They tried to change those decisions.'

One issue here is that this seems to be the only pragmatically viable option. Also, it is entirely possible that the more syntactic complexity one introduces, the less vagueness/ambiguity there will be, given that each syntactic layer may bring with it some syntactic constraints. Hence my reliance on simple, single-clause sentences in this paper. As will be seen below in the text, there is also the influence of aspect and animacy considerations. Still, if we consider a different scenario, by changing the words, we obtain different types of interpretations for (ii) in comparison to (i), as these now become pragmatically more salient:

(ii) Ova deca su se pokušala tući.
these children AUX SE tried hit
'These children tried to hit each other/someone else.'
?? 'Someone tried to hit these children.'

[10]For example, the use of the explicit reflexive 'sebe' in (11) in the text is forced, whereas the use of the middle in (9) is more natural, in the absence of some contrastive or other stress. In addition, explicit passives are only rarely used in Serbian, and many passive interpretations sound much better with *se* middles. On top of that, some verbs, at least in certain verb tenses/aspects, do not even have a passive form (see the contrast between (i) and (ii) below). Interestingly, there is a passive form of the counterpart

It is also of note that sentences with dropped *se* are not vague either, but instead explicit, featuring a null object interpretation, reflecting again an accusative type grammar, which can be assumed to be the dominant, default grammar in Serbian:

(14) Deca se udaraju. (vague middle)
children SE hit
'One hits children.'

(15) ?Deca udaraju. (only null-object sense; slightly marginal, as in English)
children hit
'Children hit.'

(16) Žene se čuju. (vague middle)
women SE hear
'One hears women.'

(17) Žene čuju. (only null-object sense)
women hear
'Women can hear.'

In other words, it is the presence of *se* that frees the interpretation from the confines of the default/dominant accusative grammar. In that sense, *se* can be seen as that grammatical particle which signals the use of a non-default grammar type, i.e. absolutive grammar. To the extent that the only argument in these middles can be either subject-like or object-like, or both at the same time (reflexives, reciprocals), the only unified analysis of *se* middles in Serbian is the one that invokes an absolutive role.[11] I would like to submit that these *se* middles, due to their underspecified semantics, are particularly well-suited for expressing reflexive (and reciprocal) readings without using specialized reflexive pronouns, which is why such structures are often referred to as "reflexives," and why *se* is often confused with a reflexive. The reflexive readings involve a low elaboration of events in the sense that a single participant both causes and undergoes the action.

Still, one might be tempted to analyze the different readings found in *se* middles as involving distinct syntactic structures.[12] Consider some well-known examples of

which contains aspectual affixes, as in *prepričavana* 'told and told again').

(i) Ova legenda se priča vekovima.
this legend SE narrated/told centuries.LOC
'This legend has been narrated for centuries.'

(ii) ?*Ova legenda je pričana vekovima.
this legend AUX narrated/told centuries.LOC
intended: 'This legend has been narrated for centuries.'

[11] It is also of potential interest that the so-called dative subjects in Serbian typically co-occur with *se* (i), implying that they utilize the absolutive foundation.

(i) Njoj *(se) čita knjiga.
she.DAT SE reads book.NOM
'She feels like reading a book.'

Here, nominative on the "object" *knjiga* is like an absolutive, nominative being also the case of intransitive subjects, while dative adds an external argument, akin to an ergative. As pointed out in e.g. Trask (1979, 398), the ergative case is often identical to the genitive, dative, or locative. According to Nash (1996, 171), ergative subjects, like dative subjects, cannot co-occur with structural accusative, but instead appear with absolutive/nominative objects. To put it differently, dative subjects are incompatible with accusative grammars, and as such they can be seen as another pocket of ergativity.

[12] Rivero & Milojević-Sheppard (2003) propose such an analysis of *se* for Slovenian and Polish, in which *se* is treated as an argument, more specifically as a kind of defective indefinite pronoun. Even though there are many similarities, there are also many differences, suggesting that *se* in other Slavic or Romance languages may have grammaticalized differently than it has in Serbian. My claims in this paper only pertain to

seemingly distinct uses of *se* in Serbian:

(18) Ljudi se briju.
people SE shave
'People shave.'

(19) Kod ovog berbera, ljudi/brade se briju svaki dan.
at this barber people/beards SE shave every day
'At this barber shop, people/beards get shaved every day.'

(20) Jabuke se jedu.
apples SE eat
'Apples are for eating/Apples are being eaten.'

One is tempted to analyze (18) as involving a reflexive pronoun (*se*) in the object position inside VP, and people Merging in vP as an external argument, while (20) can be seen as passive-like, with apples Merging as an internal (object) argument in VP, and *se* Merging in vP. While this would easily fit in the current theoretical framework, it would be exactly the wrong approach to these data. This kind of structural differentiation comes to mind only because the pragmatics foregrounds these two respective readings. As with Tchekhoff's comment regarding yams (footnote 4), apples cannot really eat themselves, or each other, or anybody else, and thus the only pragmatically plausible interpretation is the passive-like reading, where apples are being eaten. As for (18), the most typical pragmatic situation is the one where people shave themselves, i.e. reflexive, but given the right context, (18) can certainly acquire the other interpretations, including passive-like in (19).

As shown in Progovac (2015a), the predicates of these *se* middles can coordinate regardless of the theta roles of their subjects, which argues against multiple structural ambiguities. For example, the coordination in (21) below, in which *se* is shared, shows that null object and reflexive readings are neither lexically nor structurally distinct. If these readings were to involve two distinct lexical entries for *se* (somebody vs. self in (21)), then this coordination option would not be available.[13] It is important to point out here that *znojiti se* is a verb that can only be used with *se*, so *se* must be shared between the two verbs in (21).

(21) Jovan se ljubi i brije/znoji.
Jovan SE kisses and shaves/sweats
'Jovan is kissing (somebody) and shaving/sweating (himself).'

The following example shows that reflexive and reciprocal readings are not distinct either. Again, if *se* were to involve two separate lexical entries in the two conjuncts in (22) (each other vs. self), then the coordination below should not be possible, contrary to fact:

(22) Oni se dodaju loptom i znoje.
they SE pass ball.INST and sweat
'They are passing the ball to each other and sweating (themselves).'

Even more dramatically, passive-like and reflexive readings can also coordinate. As mentioned above for *znojiti* 'sweat', *pretopliti* 'over-heat' and *radovati* 'rejoice' also must occur with *se* in this case, which again indicates that *se* in (23-a)–(24-a) is shared between the two verbs, as also highlighted by the ungrammaticality of (23-b)–(24-b).

(23) Context: Parents often make mistakes with babies:

Serbian.

[13] This example also allows the reading on which both actions are reflexive, that is, the reading on which Jovan is kissing himself, and shaving/sweating (himself). This is the only reading that the alternative analysis should allow, and yet this reading is highly unpreferred, as it is pragmatically odd. The less grammar there is, the more reliance on pragmatics.

a. Bebe se pretople i onda oznoje, i tako nastaju problemi.
babies SE over-heat and then sweat, and that-way emerge problems
'Babies get over-dressed and then sweat, leading to problems.'
b. *Bebe onda oznoje, i tako nastaju problemi.

(24) Context: Newborn babies are held in a separate hospital room from the mothers:
a. ?Kadgod udju majke u sobu, bebe se doje i naravno
whenever enter mothers in room, babies SE breastfeed and of.course
raduju.
rejoice
'Whenever mothers enter the room, babies are breastfed and of course rejoice.'
b. *Bebe naravno raduju.

If babies in the first (passive-like) conjunct of (23-a)–(24-a) were generated in VP as an object and *se* as an external argument in vP, then this structure should not be able to coordinate with the second conjunct, in which *se* would be a reflexive pronoun on this analysis, presumably generated in VP, and babies would be an external argument. Similar considerations hold of (25).[14]

(25) ?Takvi filmovi se često gledaju i dopadaju svima.
such movies SE often watch and like everyone.DAT
'Such movies are watched and liked by everyone.'

(26) *Takvi filmovi dopadaju svima.

Also, it is worth pointing out the sharp contrast between (23-a),(24-a),(25) on the one hand, and (23-b),(24-b),(26) on the other hand. If (23-a)–(25) were impossible coordinations, they should sound just as terrible as (23-b)–(26) do. Instead, these examples are judged by my informants and myself as either acceptable, or as requiring one question mark.[15]

Seeking independent, neurolinguistic evidence for the syntactic distinction between middles and transitives, we tested the processing of Serbian middles, in contrast to corresponding transitives, using the fMRI subtractive methodology (Progovac et al. 2018a). We hypothesized that the processing of Serbian *se* middles, analyzed as lacking a vP layer, relative to matched transitive accusative structures (with vP), would result in reduced activation in the Broca's–basal ganglia networks, the networks implicated in syntactic processing. The fMRI stimuli consisted of middles and transitives, as exemplified in

[14] A reviewer of Progovac (2015a) brings up the example in (i) to suggest that these kinds of mixed-and-matched interpretations are not always available:

(i) Deca se ljube i udaraju.
children SE kiss and hit
'One kisses and hits children.' or
'Children kiss and hit each other.'

For the reviewer, only those interpretations are available in (i) in which deca is either the theme/patient argument, or the agent argument of both verbs. Again, there is no doubt that many examples will favor, or strongly favor, one vs. another interpretation. In order to get additional interpretations, especially the mixed-and-matched interpretations, one needs to construct specific pragmatic contexts, such as using "babies" in (23-a),(24-a). Such contexts, by excluding certain interpretations pragmatically, make the other (less likely) readings shine. This strategy is akin to the way inverse scope readings are foregrounded in semantics literature, as such readings are typically hard to get, but can be made to "shine" by excluding the more likely interpretations pragmatically.

[15] In addition to my own judgments on (23-a)–(25), these are also the judgments of 4 more linguists who are native speakers, who I consulted. In this respect, I thank Draga Zec for providing the data in (23-a) and (25), and Aida Talić, Ivana Jovović, and Željko Bošković, for checking the examples in (23-a)–(25). They all helped me come up with pragmatically and aspectually more plausible examples. I thank the reviewer for challenging me to find better examples.

(27)–(30), where the presence of *se* corresponds to the middle grammar as in (27) and (29), while the presence of the accusative personal pronoun, such as *me* 'me' in (28) and (30), is the product of the accusative grammar. In the relevant context, (27) and (28) receive the same interpretation, and so do (29) and (30).

(27) Mama, ovaj pas se ujeda!
mom this dog SE bites
'Mom, this dog is biting (me)!'

(28) Mama, ovaj pas me ujeda!
mom this dog me bites
'Mom, this dog is biting me!'

(29) Ne guraj se!
not push.IMP SE
'Don't push (me)!'

(30) Ne guraj me!
not push.IMP me
'Don't push me!'

Processing of transitives, compared to middles, showed an increased activation in the basal ganglia, bilaterally: [on the left: Transitives: .25 ± .14, Middles: .06 ± .13, $t(12) = 5.64$, $p < .001$] and the right [Transitive: .23 ± .12, Middles: .04 ± .12, $t(12) = 4.57$, $p = .001$]. We did not find a contrasting effect in Broca's area. However, transitives, compared to middles, evoked greater activation in the precentral gyrus (BA 6), proposed to be part of the "Broca's complex" (Ardila et al. 2016a,b).

2.3 THE ABSOLUTIVE GRAMMAR BEHIND VERB–NOUN COMPOUNDS

While the majority of verb-noun compounds feature nouns that can be interpreted as objects/themes of the verb (e.g. *kill-joy*; *pick-pocket*; *turn-coat*), this is not at all the case with the rest of these compounds. For many of them it is either not possible to tell, or it is clear that their nouns are subject-like (e.g. *cry-baby*; *stink-bug*; *rattle-snake*; *worry-wart*; *copy-cat*; *catch-phrase*; *busy-body*).[16] In fact, one and the same verb can take either object-like nouns (*tumble-dung* (beetle); *turn-coat* (traitor)), or subject-like nouns (*tumble-weed*; *turn-table* (gramophone)). In other words: a tumble-dung is a beetle who tumbles dung but a tumble-weed is a weed that tumbles, not somebody who tumbles weed. Similarly, a turn-coat is a traitor who turns his coat/skin, but a turn-table is a table that turns, not somebody who turns tables.

The same thematic underspecification is attested in Serbian VN compounds. While the majority of these compounds seem to feature nouns that are object-like (31), there are also many that are subject-like, or where it is difficult to tell (32).

(31) muti-voda (muddy-water, 'trouble-maker'; i.e. the one who muddies waters)
podvi-rep (fold-tail, 'someone who is crestfallen'; i.e. the one who folds his tail)
vrti-guz (spin-butt, 'restless person, fidget')
jebi-vetar (screw-wind, 'charlatan')

(32) kaži-prst (says/shows-finger, 'index finger'; i.e. the finger which shows)
pali-drvce (light-stick, 'matchstick'; i.e. the stick that both ignites and gets ignited)

[16] At the very least, to respond to the reviewer's comment, the noun in these cases can certainly not be interpreted as object-like. In that sense, a cry-baby cannot be someone who cries babies; a rattle-snake cannot be someone who rattles snakes. But the reviewer is right in pointing out that this is more difficult to tell in case of more idiomatic expressions, such as perhaps *worry-wart* or *copy-cat*. The broader point is that there is vagueness and imprecision in the composition of these compounds, and that they are certainly not all verb-object compositions. Even *dare-devil* is interpreted by some speakers of English as a devil who dares, i.e. is as subject-like, as discussed in Progovac (2015b).

tuži-baba (whine-(old)woman, 'tattletale')
lezi-baba (lie-(old)woman, 'loose woman or man')

In other words, these one-argument small clauses do not distinguish subject-like from object-like interpretations grammatically, serving as especially good approximations of the reconstructed absolutive-like one-argument grammars (Progovac 2015b,a, 2016, 2019).[17] It is of special interest that these compounds are often humorous and that they specialize for insult/verbal aggression when referring to humans, the finding which allowed us to cross-fertilize this proposal based on linguistic theory with the recent biological theory of human evolution, the Self-Domestication Hypothesis (SDH).[18] Our proposal capitalizes on the ability of such crude compounds to contribute to a reduction of physical aggression by replacing it with verbal aggression, alleviating stress responses also through humor (Progovac & Locke 2009, Progovac & Benítez-Burraco 2019, Benítez-Burraco & Progovac 2021). The centerpiece of the SDH is the steady, gradual reduction in reactive aggression in humans, accompanied by a reduced response of the HPA (hypothalamic–pituitary–adrenal) axis to stress, and by a decrease in cortisol levels, all contributing to increased prosociality and to gradual complexification of languages/grammars.

If the nouns in VN compounds are analyzed as absolutive, then there's nothing exceptional ('exocentric') about these compounds; instead, they just instantiate a different grammar type. VN compounds are typically characterized in morphological texts as "exocentric," i.e. lacking a head, in the sense that a pick-pocket is not a kind of pocket (e.g. Spencer 1991, Selkirk 1982). However, if the analysis here is on the right track, then 'exocentric' is a misleading term, and does not yield a unified analysis of these compounds, once more reflecting our accusative bias. From this bias, it may seem that there are two distinct types of VN compounds, exocentric and endocentric, given that *turn-table* and *tumble-weed* seem endocentric (i.e. headed by table and weed, respectively), but they are the exact same morphosyntactic type as *turn-coat* and *tumble-dung* (for an extensive discussion of this, see Progovac 2015b).

Consider also that VN compounds cannot be uniformly analyzed as having a null *-er* counterpart (as with *kill-joy* vs. *joy-killer*), as illustrated by the following examples from English (33) and Serbian (34). Quite obviously, only those compounds that involve a theme (object-like) argument can be so paraphrased.

(33) *baby-crier; *body-busier; *bug-stinker; #snake-rattler; #weed-tumbler
(which would be based on: cry-baby; busy-body; stink-bug; rattle-snake; tumble-weed)

(34) *babo-tuž-ac; *prsto-kaz-ac; *bubo-smrd-ac
(which would be based on: tuži-baba (whine-old.woman; tattletale), kaži-prst (say/show finger—index finger), smrdi-buba (stink-bug)

Moreover, there is evidence that at least *-ac* compounds in Serbian are built upon the small clause VN foundation, and that they cannot be analyzed as simple N-N combinations (35)–(37). With very few exceptions, Serbian *–ac* does not attach to a verb directly (37), but only if there is a noun incorporated (36), i.e. if there is a VN foundation (Progovac 2005b, 2015b).[19] In this respect, *-ac* attachment works like dependent case, akin to ergative attachment. Some traces of ergativity in English *-er* compounds can be found

[17] Progovac (2019) discusses some challenges raised for the notion of syntactic approximations/fossils, and offers a response to such challenges.

[18] It is important to highlight that these compounds tend to be derogatory only when they refer to humans, leaving compounds such as *rattle-snake*, *tumble-weed*, *kaži-prst* neutral in this respect. The derogatory specialization of these compounds when they refer to humans is discussed and exemplified with dozens of examples from a variety of languages in Progovac (2015b).

[19] Otherwise, to attach directly to a verb, a different suffix must be used, often but not always *-ač*:

(i) der-*ač* (ripper); rez-*ač* (carver); pliv-*ač* (*pliv-*ac*) (swimmer); ljub-itelj (fan).

in e.g. *heart-break-er* (*#breaker*) and *brick-lay-er* (*#layer*). While it may be possible to use PP complements with such nouns in English (although not in Serbian), such as 'He is a breaker of hearts,' these uses are somewhat marginal. Additionally, one cannot just use the word *breaker* on its own to refer to somebody who breaks something in general; instead, the word *breaker* when used on its own is interpreted as a back formation from *circuit-breaker*. For a more elaborate discussion of these compounds, see Progovac (2015a).[20]

(35) $[_{SC}$ der[i] koža] ('rip-skin') *vs.*
$[_{vP}$ -ac $[_{SC}$ der koža]] → [kož-o-der-ac] ('skin-ripper')

(36) kamen-o-rez-ac (stone-O-carve-ER, 'stone-carver')
srebr-o-ljub-ac (silver-O-love-ER, 'money-lover')

(37) *der-ac; *rez-ac; *ljub-ac

In an experiment designed to test the acquisition of *-er* compounds in English, Clark et al. (1986) prompted children to produce compounds such as the ones in (38). At around 3, children mostly produced related VN combinations, as given in (39). Before reaching the target stage, many children also experimented with another, intermediate stage (40). At the very least, children treat *-er* compounds as related to VN compounds; they also seem to treat VN compounds as the simpler counterparts, as the foundation needed to eventually build *-er* compounds (Clark et al. 1986).

(38) This is a cheese-grater/ paper-ripper/ ball-bouncer.

(39) This is a grate-cheese/ rip-paper/ bounce-ball.

(40) This is a dry-hairer/dryer-hair; fix-biker/fixer-bike; bounce-baller/bouncer-ball.

With a goal to provide some further independent evidence for a distinct, simpler syntactic nature of VN compounds, in an fMRI experiment we contrasted the processing of VN compounds (e.g. *kill-joy*; *pick-pocket*; *cry-baby*) vs. more hierarchical *-er* compounds (e.g. *joy-kill-er*; *boot-lick-er*; *whistle-blow-er*) and found a robust effect in the fusiform gyrus area (BA 37) (Progovac et al. 2018b). BA 37 is the area where visual processing and certain non-compositional semantic processing (e.g. concreteness, metaphor) come together (e.g. Bookheimer 2002). VN compounds seem to evoke a more vivid, more visceral effect, even though the two compound types were matched in imageability/metaphoricity. One possible explanation is that the additional layer(s) of abstract syntactic structure render *-er* compounds less visceral/imageable, indirectly supporting our hypothesis that VN compounds are characterized by less syntactic structure, i.e. fewer syntactic layers.[21] This finding is relevant also for the evolutionary considerations of cross-modality, directly implicated in metaphoricity, and cognitive disorders associated with it (see Benítez-Burraco & Progovac 2021, and references there).

While the grammar of verb-noun compounds may be absolutive, and the attachment

[20] A reviewer wonders if this analysis predicts that unattested examples such as *srebro-ljub* (intended: 'silver-lover') or *kožo-der* (intended: 'skin-ripper') should be possible. Since my claim is only that *-ac*, as a dependent, ergative-type morpheme, only attaches to a construction which already has one argument, as far as I can see, my analysis does not make a prediction about what is possible or not in the absence of *-ac*. Having said that, I point to the existence of compounds such as *puto-kaz* (road-shower, i.e. 'road sign'), which seem related to *-ac* compounds, and yet do not feature *-ac*. This seems to correlate with the inanimate status of the referent of this word. The analysis of this phenomenon is beyond the scope of this paper.

[21] A reviewer points out that this result may be due to the fact that VN compounds start with a verb, which immediately suggests that an argument is needed. It is entirely possible that other factors also contribute to distinguishing the two compound types. Still, the interpretation of the results given in the text is consistent with the acquisition experiments by Clark et al. (1986), as well as with the morpho-syntactic analysis of these compounds in Progovac (2015b).

of at least *-ac* in Serbian ergative, the compounds by themselves cannot establish a split alignment in this language, although they do add weight to the hypothesis that predication can be decomposed into evolutionary primitives. The evidence for a synchronic alignment split needs to be sought in highly productive, sentential aspects of the grammar. As discussed in the previous section, *se* middles in Serbian do provide such evidence for a split accusative status of Serbian.

3 ERGATIVE AND ACCUSATIVE SPLITS

The evidence discussed in this paper points to the conclusion that Serbian should be classified as a split accusative language, on analogy with split ergative languages, given that *se* middles, analyzed here as exhibiting an absolutive grammar, are highly productive and rather common in Serbian, warranting this language a split accusative status.[22] The two grammars in Serbian, the accusative grammar, and the absolutive grammar, compete for their influence, as will be further illustrated below. There is no reason why alignment splits should be attested only in predominantly ergative languages. According to e.g. Coon & Preminger (2017), the splits are not so much ergative vs. accusative, but ergative-neutral (unmarked), or accusative-neutral; such splits are just harder to spot in predominantly accusative languages.

Split ergativity (i.e. presence of accusative patterns in predominantly ergative languages) is typically sensitive to an animacy hierarchy (see e.g. Silverstein 1976) or to aspectual properties. For example, in Sinhalese (Sri Lanka), inanimates follow ergative patterns, while animates follow accusative patterns (Gair 1970; see also Comrie 1989, for Hua, Papua New Guinea; Aissen 2003 for DOM – differential object marking). While split ergativity exhibits accusative patterns with high elaboration of events, including animates, split accusativity can be expected to show the opposite, complementary patterns, i.e. non-dominant, absolutive patterns with inanimates, and more generally with low event elaboration. While there are certainly overlapping options (e.g. (41), (43)), there is also a division of labor, a competition, between the two grammars in Serbian, sensitive to animacy (see also the discussion in §2.2, including the division of labor between the passive voice and *se* middles):[23]

(41) Prozor se razbio. (also o.k. Razbili su prozor.)
window.M SE broke.M.SG broke.M.PL AUX.PL window.ACC
'(The) window broke.' 'They broke the window.'

(42) *Golman se razbio. (but o.k. Razbili su golmana.)
goalie.M SE broke.M.SG broke.M.PL AUX.PL goalie.ACC
?? '(The) goalie broke.' 'They broke the goalie.'

(43) Meso/pile se pojelo. (also o.k. Pojeli su meso/pile.)
meat/chicken.N SE eaten.N.SG eaten.M.PL AUX.PL meat/chicken.ACC
'(The) meat/chicken got eaten.' 'They ate the meat/chicken.'

(44) ???Lav se pojeo u šumi. (but o.k. Pojeli su lava.)
lion.M SE eaten.M.SG in forest eaten.M.PL AUX.PL lion.ACC
'(The) lion got eaten in the forest (e.g. by hyenas).' 'They ate the lion.'

(45) *Marina se pojela. (but o.k. Pojeli su Marinu.)
Marina.F SE eaten.F.SG eaten.M.PL AUX.PL Marina.ACC
intended: 'Marina got eaten.' 'They (e.g. hyenas) ate Marina.'

[22] In Nichols et al.'s (2004) typology, Serbian would be classified as a detransitivizing language, where *se* acts as a detransitiviser.

[23] Perhaps, as the reviewer points out, the example (45) would sound better in the context of cannibalism. That would still suggest some sensitivity to animacy, as at least in the case of cannibalism, Marina would not be used as food by creatures lower on the animacy hierarchy than herself.

(46) *On se pojeo. (but o.k. Pojeli su ga.)
he.M.NOM SE eaten.M.SG eaten.M.PL AUX.PL him.ACC
intended: 'He got eaten.' 'They (e.g. hyenas) ate him.'

In this case, the higher on the animacy hierarchy a noun phrase is (roughly, Human > Animate > Inanimate), the harder it is to employ the absolutive grammar, i.e. *se* middles, and the more likely to require the explicit accusative strategies. This pattern thus seems complementary to the animacy-based ergative splits.

4 CONCLUDING REMARKS

Evidence presented in this paper suggests that Serbian has settled on a hybrid grammar situation, using the absolutive-based *se* grammar (middle grammar) for low elaboration of events, and for the inanimate side of the Animacy Hierarchy, whereas the dominant accusative grammar is used for more elaborated event structure, and for the animate/human end of the Animacy Hierarchy, with significant overlaps and competition (division of labor) attested between the two grammars. This leads to the conclusion that Serbian should be characterized as a split accusative language, on analogy with the well-attested split ergative languages. These findings are related to the previous proposal that predication in human language evolved gradually, starting with the one-argument, absolutive basis, and that cross-linguistic variation in transitivity can be reduced to this common denominator. The evidence for this proposal comes from both formal syntactic and neurolinguistic patterns, demonstrating how formal, typological, and evolutionary considerations can be brought directly together, to identify further possibilities for testing, and to shed new light on each other's old mysteries.

ABBREVIATIONS

ABS	absolutive	INST	instrumental
ACC	accusative	LOC	locative
AUX	auxiliary	NOM	nominative
DAT	dative	SC/VP	Small Clause/Verb Phrase
ERG	ergative	SDH	Self-Domestication Hypothesis
IMP	imperative	PL	plural
INF	infinitive	PRES	present

ACKNOWLEGMENTS

I am grateful to the anonymous reviewer for many good comments. My acknowledgment of those who provided or checked the relevant data is given in a footnote. I am very grateful to Lanko Marušič for all his help with the preparation of the manuscript. All errors are mine.

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