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On distinguishing dative arguments from PPs¹

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1. Introduction

The syntax of ditransitive structures has been a thriving area of research in the past few decades, and Léa Nash’s work (Boneh & Nash 2011a; Nash 2016a; Boneh & Nash 2017; Matushansky, Boneh, Nash and Slioussar 2020) has greatly advanced our understanding of what kinds

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1. This paper is dedicated to Léa Nash. I have been fortunate to have many wonderful discussions with Léa, about syntax and about life—here’s to many more! I would like to thank for the data and the fruitful discussions Daniel Asherov, Hagen Blix, Cater Chen, Sherry Chen, Colin Davis, Boer Fu, Verena Hehl, Filipe Kobayashi, Ora Matushansky, Mitya Privoznov, Vincent Rouillard, Roger Schwarzschild, Dóra Takács, Sergei Tatevosov, Christopher Yang, Stanislao Zompi, my Georgian consultants, participants of LFRG at MIT, ENDPOINTS 2018 at Humboldt University of Berlin, and an anonymous reviewer of this festschrift. This paper follows the Leipzig glossing conventions with the following additions: AOR—aorist, CL—clitic, PV—“preradical” vowel (these vowels occur before verbal roots in Kartvelian languages and convey information about the argument structure), PVB—preverb. All errors are my own.

of syntactic representations exist for sentences with indirect objects. With a great variety of proposals about the structures of ditransitives available in the literature (Kayne 1984; Pesetsky 1995; Harley 1996; Larson 1988; Harley 2002; Cuervo 2003; Beck & Johnson 2004; Jung & Miyagawa 2004; McIntyre 2006; Pytkänen 2008; Schäfer 2008; Bruening 2010a; Bruening 2010b; Lomashvili 2010; Harley & Jung 2015, a.o.), an immediate question that arises is what the typology of these structures is and how it is constrained. How do sentences with indirect objects vary crosslinguistically, and what variation do we see within individual languages?

Léa Nash's work has addressed these questions by investigating sentences with indirect objects in French (Boneh & Nash 2011a), Georgian (Nash 2016a) and Russian (Boneh & Nash 2017; Matushansky, Boneh, Nash and Slioussar 2020) and arguing that, despite identical morphological encoding, ditransitive sentences are not a uniform class, and languages often possess several distinct syntactic representations that correspond to sentences with datives. For example, in her joint work with Nora Boneh (2017) on Russian datives Léa proposed that sometimes an indirect object that is morphologically encoded as a dative DP could be part of a (defective) PP structure (see Svenonius 2006b, 2008 on the projections of P), while at other times it is a specifier of an applicative head (Appl) that takes VP as its complement.

The possibility of the dative noun phrases being PPs in disguise (see also Jung & Miyagawa 2004; McIntyre 2006; 2011) raises the question of how to distinguish the two crosslinguistically. How do we know when a dative argument is a true argument of the verb (perhaps with the Goal or Recipient theta-role), and when it is an argument inside of a Goal describing PP, which is a complement of the verb? In this paper I suggest that looking into the event structure of ditransitive sentences can be helpful for answering this question.

I propose that only PPs, but not dative DPs, are able to introduce result states into the syntactic representation (i.e., states of the internal argument being at a certain location or in possession of a certain individual). This means that only in structures with PPs there will be a constituent that corresponds to the result state, which can be targeted by modification independently of the rest of the predicate. It has been proposed that repetitive adverbs like *again* receive different interpretations depending on their attachment site in the lexical decomposition of the predicate in syntax (Dowty 1979; von Stechow 1996; Beck & Johnson 2004; Beck 2005; Alexiadou et al. 2014;

Lechner et al. 2015, a.o.).² In this paper I show that ditransitive structures vary both crosslinguistically and intralinguistically with respect to whether repetitive adverbs can modify the result state and give rise to *the restitutive reading* (RES), according to which what is being repeated is the state of the direct object being in the possession of the indirect object or at the location described by the indirect object. Furthermore, a 3/4 pattern emerges with respect to how morphosyntactic encoding of the indirect object relates to the presence of restitutive readings: languages with dative DPs as indirect objects vary in whether the restitutive reading of adverbs like *again* is available in them, but languages with PPs always exhibit the restitutive reading in ditransitive sentences. Moreover, in some cases adding an overt PP into a ditransitive sentence leads to the appearance of the restitutive reading that was otherwise absent. I propose that these empirical findings support the idea that structures with dative arguments vary in whether the indirect object is a PP in disguise, and availability of restitutive readings of repetitive adverbs can be used as a diagnostic for the presence of a PP because the PP structure is required in order to introduce the result state into the lexically decomposed predicate in syntax.

This paper is structured as follows. In section 2 I present the main empirical generalization about the availability of the restitutive reading of repetitive adverbs in ditransitive sentences. I discuss data from both languages that use PPs to encode indirect objects in ditransitive sentences (Brazilian Portuguese, English *to*-PP construction, French, Italian) and from languages that express indirect objects as dative DPs (English double object construction, Georgian, German, Hungarian, Mandarin Chinese, Russian), and show that the latter group of languages shows variability with respect to the availability of restitutive readings. In section 3 I discuss the compositional approach to the semantics of repetitive adverbs like *again* (von Stechow 1996; Beck & Johnson 2004; Beck 2005; Alexiadou et al. 2014; Lechner et al. 2015, a.o.) and show how it derives the repetitive/restitutive ambiguity. In section 4 I present my proposal. I argue that restitutive readings in ditransitive structures reveal the presence of the PP structure in syntax, and provide

2. This is not the only approach in the literature. For example, the lexical ambiguity (“semantic”) approach (Jäger & Blutner 2000; Fabricius-Hansen 2001; Pedersen 2015, a.o.) proposes that different readings of adverbs like *again* emerge due to the lexical ambiguity of repetitive morphemes. I will not evaluate whether it can be informative with respect to the structures of ditransitives in this paper.

an account of the crosslinguistic variation presented in the section 2. Section 5 concludes the paper.

2. The typology of repetitives in ditransitive structures

Before looking at the possible readings of repetitives in ditransitives, it is necessary to note that sentences with repetitives have different syntax across languages.³ Languages differ in the positions in which adverbs like *again* can appear in sentences. For example, whereas in English a sentence-final position is default for *again*, Russian, Georgian and Mandarin strongly prefer repetitive adverbs to occupy the position right before the verb, independently of the reading that it receives. The variation seems to be a consequence of several factors: (i) whether adjuncts like *again* are linearized to the left or to the right of the constituents that they modify; (ii) whether repetitive adverbs undergo movement followed by reconstruction (Xu 2016);⁴ (iii) whether other constituents in the clause undergo movement. In some cases different placements of an adverb within the same sentence can result in different interpretations. For example, German *wieder* allows restitutive interpretations when it follows the object, but not when it precedes it:

- (1) ... (dass) Ali Baba Sezam wieder öffnete. (*adapted from von Stechow 1996: 88*)
 ... (that) Ali Baba Sezam again opened
 a. REP: 'Ali Baba opened Sezam, and that happened before.'
 b. RES: 'Ali Baba opened Sezam, and Sezam had been open before.'
- (2) ... (dass) Ali Baba wieder Sezam öffnete. (*adapted from von Stechow 1996: 88*)
 ... (that) Ali Baba again Sezam opened
 a. REP: 'Ali Baba opened Sezam, and that happened before.'
 b. RES: '*Ali Baba opened Sezam, and Sezam had been open before.'

Von Stechow claims that the two readings correspond to two attachment cites of *wieder* (to VoiceP and to a small clause), and that the difference between (1) and (2) stems from the fact that the object undergoes movement to a higher position for case reasons: if *wieder* precedes the object that moved, it must have been attached higher (VoiceP), and thus only repetitive (REP) reading is available (2); the word order in which *wieder* follows the object is compatible with both the higher (VoiceP) and the lower (small clause) attachments, hence the ambiguity (1). Thus, this is an example of

3. I thank an anonymous reviewer for the suggestion to address this question at the outset of the discussion.

4. Xu (2016) argues that Mandarin *you* 'again' is base-generated next to the constituent that it modifies and then moves into the preverbal position (where we see it at PF), but this movement undergoes reconstruction.

how movement of another constituent (direct object) results in the readings of a repetitive adverb being dependent on word order.

Given the outlined variation, my strategy for comparing repetitives in ditransitives across languages was as follows. I tried all possible word orders in attempt to find one that would be compatible with the restitutive reading. In languages where there was at least one such word order, I present a sentence with the order preferred for that reading. In languages in which no word order worked, I present a sentence in which the adverb is in the same position as it would be in sentences with accomplishments like *open* under the restitutive reading, as it illustrates the best attempt at such a reading. As we will see, there does not seem to be an obvious correlation between the preferred position of repetitives and whether the restitutive reading in ditransitives is possible: e.g., both Mandarin and Georgian strongly prefer repetitives to occur before the verb, but the former allows restitutive readings in ditransitives, while the latter does not.

From the languages in my sample, Brazilian Portuguese (3), French (4) and Italian (5) encode indirect objects in sentences with a ditransitive verb meaning ‘give’ as prepositional phrases. English also has an option to express the indirect object as a PP by using a *to*-PP construction (6). What we see in (3)-(6) is that repetitive adverbs meaning ‘again’ can receive two interpretations in these sentences.

- (3) O João deu o livro de novo pra Maria *Brazilian Portuguese*
 the John give.3SG.PST the book again to.the Maria
 ‘John gave Maria the book again.’
 a. REP: ‘John gave Maria the book, and that had happened before.’
 b. RES: ‘John gave Maria the book, and Maria had had the book before.’
- (4) Jean a de nouveau donné le livre à Marie. *French*
 John has again given the book to Maria
 ‘John gave Maria the book again.’
 a. REP: ‘John gave Maria the book, and that had happened before.’
 b. RES: ‘John gave Maria the book, and Maria had had the book before.’
- (5) Gianni ha dato di nuovo il libro a Maria. *Italian*
 John has given again the book to Maria
 ‘John gave Maria the book again.’
 a. REP: ‘John gave Maria the book, and that had happened before.’
 b. RES: ‘John gave Maria the book, and Maria had had the book before.’
- (6) John gave the book to Mary again. *English to-PP construction*
 a. REP: ‘John gave Mary the book, and that had happened before.’
 b. RES: ‘John gave Mary the book, and Mary had had the book before.’

The first interpretation of 'again' in (3)-(6) is *repetitive* (REP): 'again' indicates that the whole eventuality described by the ditransitive predicate has happened before—John gave Mary the book at some prior time. The second, *restitutive* (RES) interpretation of 'again' states that what occurred before is the result state of the eventuality described by the ditransitive predicate—Mary had the book in her possession at some prior time.⁵

The languages from my sample in which the indirect object is encoded as a DP (and is marked with dative case in languages with overt case) split into two groups with respect to the availability of the restitutive reading. German (8) and Mandarin Chinese (9), as well as the double-object construction in English (7)⁶ represent cases in which the restitutive reading of adverbs like *again* is available.

- (7) Thilo gave Satoshi the map again. *English double-object construction*
 a. REP: 'Thilo gave Satoshi the map, and that had happened before.'
 b. RES: 'Thilo gave Satoshi the map, and Satoshi had had the map before.'
 (Beck & Johnson 2004: 113)
- (8) ...dassHans dem Mädchen ein Buch wieder gab. *German*
 ...thatHans the.N.DAT girl a.N.ACC book again gave
 '...that Hans gave the girl the book again.'
 a. REP: '...that Hans gave the girl the book, and that had happened before.'
 b. RES: '...that Hans gave the girl the book, and the girl had had the book before.'
- (9) Yuchan you gei le Mali zhe=ben shu. *Mandarin*
 John again give PFV Mary this=CL book
 'John gave Mary this book again.'
 a. REP (accent on 'again'): 'John gave Mary the book, and that had happened before.'
 b. RES (accent on 'give'): 'John gave Mary the book, and Mary had had the book before.'

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5. One might wonder whether the two readings are separate. Indeed, the repetitive reading entails the restitutive reading: every scenario in which John gave Mary the book at some prior time will also be a scenario in which Mary had a book in her possession at some prior time. However, Lechner et al. (2015) convincingly show with the data from non-monotone quantifiers like *exactly one student* that the two readings are in principle distinct: it is possible to construct scenarios that verify the repetitive reading and falsify the restitutive one with non-monotone quantifiers.
6. Beck & Johnson (2004) provide a detailed discussion of *again* in English double object construction, and claim that the availability of restitutive readings is an argument for the small clause analysis. They also discuss restitutive readings with the DP + PP frame of motion verbs, and conclude that the PP in these structures is actually a small clause that contains a silent argument that is anaphoric to the object of a higher verb.

Languages that fall into the second group are Georgian (10), Hungarian (11) and Russian (12):⁷

- (10) šota-m levan-s c'igni iseV misca /gaugzavna /daubruna. *Georgian*
 Shota-ERG Levan-DAT book.NOM again gave /sent /returned
 'Shota gave/sent/returned Levan the book again.'
 a. REP: 'Shota gave/sent/returned Levan the book, and that had happened before.'
 b. RES: *'Shota gave/sent/returned Levan the book, and Levan had had the book before.'
- (11) Péter megint odaadta a knyvet Marcsinak. *Hungarian*
 Peter again gave the book.ACC Mary.DAT
 'Peter again gave Mary the book.'
 a. REP: 'Peter gave Mary the book, and that had happened before.'
 b. RES: *'Peter gave Mary the book, and Mary had had the book before.'
- (12) Maša opjat' otdala/otpravila Kate knigu. *Russian*
 Masha again gave /sent Katya book
 'Masha gave/sent Katya the book again.'
 a. REP: 'Masha gave/sent Katya the book, and that had happened before.'
 b. RES: *'Masha gave/sent Katya the book, and Katya had had the book before.'

As we see, in these languages the repetitive adverb 'again' cannot be understood as modifying only the result state of some individual having the book. It has to be the case that the whole event of giving previously took place in order for (10)–(12) to be felicitous.

The crosslinguistic variation discussed above is summarized in table 1. We observe a 3/4 pattern: there are languages with DP indirect objects that have restitutive readings in ditransitives, languages with DP indirect objects that lack such readings, and languages with complement PP indirect objects that exhibit restitutive readings. But there seem to be no languages in which the indirect object is a complement PP but the restitutive reading of an adverb like *again* is unavailable.

	RES reading available	RES reading unavailable
indirect object is a PP	Brazilian Portuguese, French, Italian, English <i>to</i> -PP construction	—
indirect object is a (dative) DP	English double object construction, German, Mandarin	Georgian, Hungarian, Russian

Table 1. Crosslinguistic variation: availability of restitutive readings in ditransitives

One question that arises is whether the observed variation is just a side effect of the different properties of repetitive adverbs in these languages. I would like to argue that this is not the case: Georgian *isev*,

7. See (Bondarenko 2018) for a detailed discussion of repetitive adverbs in Russian ditransitives.

Hungarian *megint* and Russian *opjat'* fall into the class of adverbs that exhibit restitutive readings whenever the structure allows it. It has been noted in the literature (Rapp & von Stechow 1999; Beck 2005) that repetitive adverbs differ with respect to what kind of constituents they can attach to, and the Visibility Parameter has been proposed to capture the different properties of adverbs:

- (13) **Visibility Parameter for adverbs** (*adapted from Beck 2005:14*)
 An adverb can modify:
 (i) only independent syntactic phrases
 (ii) any phrase with a phonetically overt head
 (iii) any phrase
- The default setting is (i).

According to the Visibility Parameter, all adverbs can access independent syntactic phrases (e.g., VPs). In addition to that, some adverbs can also modify phrases with phonetically overt heads (e.g., complex predicate constructions like *wipe [the table clean]*). And only a subset of those adverbs can look inside a decomposition structure and modify result states of lexical accomplishments like *open*. An example of a repetitive adverb that cannot receive restitutive readings in sentences with lexical accomplishments is German *erneut* (class (i)):

- (14) Maria hat die Tür erneut geöffnet. (*adapted from Beck 2005:12*)
 Maria has the.F.ACC door again opened
 'Maria opened the door again.'
 a. REP: 'Maria opened the door, and that had happened before.'
 b. RES: *'Maria opened the door, and it had been open before.'

So could it be that Georgian *isev*, Hungarian *megint* and Russian *opjat'* that we see in (10)-(12) are like German *erneut* and are unable to modify result states of ditransitives simply because they belong to the class (i) or class (ii) adverbs of the Visibility Parameter? If that was the case, these adverbs should also not be able to modify result states of lexical accomplishments like *open*. However, as (15)-(17) below illustrate, this is not the case: these adverbs can get restitutive readings in sentences with lexical accomplishments like 'empty' and 'open':

- (15) Petja opjat' opustošil butylku. *Russian*
 Petya again emptied bottle
 'Petya emptied the bottle again.'
 a. REP: 'Petya emptied the bottle, and that had happened before.'
 b. RES: 'Petya emptied the bottle, and the bottle had been empty before.'
- (16) šota-m k'ari isev gaayo. *Georgian*
 Shota-ERG door.NOM again open.AOR.3SG
 'Shota opened the door again.'
 a. REP: 'Shota opened the door, and that had happened before.'
 b. RES: 'Shota opened the door, and the door had been open before.'

- (17) Péter megint kinyitotta az ablakot. *Hungarian*
 Peter again opened the window.ACC
 'Peter opened the window again.'
 a. REP: 'Peter opened the window, and that had happened before.'
 b. RES: 'Peter opened the window, and it had been open before.'

Thus, these adverbs must fall into the class (iii) of the Visibility Parameter, and we expect them to display no restrictions as to what kinds of result states they can modify. Hence, the impossibility of restitutive readings of these adverbs in ditransitive structures cannot be explained by the properties of these adverbs.⁸

In addition to crosslinguistic variation, languages also exhibit intralinguistic variation with respect to the availability of restitutive readings in ditransitive configurations. Here I illustrate this with Georgian locative applicatives; see (Bondarenko 2018) for discussion of restitutive readings with locative applicatives and high applicatives in Russian.⁹

We have seen that Georgian doesn't allow restitutive readings with ditransitive verbs like 'give'/'send'/'return' (10). But it allows restitutive readings in sentences with dative arguments which seem to be derived by a valency changing operation from prepositional phrases (so-called *locative version*). Consider the sentences in (18)–(19).

- (18) šota-m es c'igni im cign-ze isev da-d-o
 Shota-ERG this book.NOM that book-on again PVB-put-AOR.3SG
 'Shota put this book on that book again.'
 a. REP: 'Shota put this book on that book, and that had happened before.'
 b. RES: 'Shota put this book on that book, and this book had been on that one before.'
- (19) šota-m es c'igni im cign-s isev da-a-d-o
 Shota-ERG this book.NOM that book-DAT again PVB-PV-put-AOR.3SG
 'Shota put this book on that book again.'
 a. REP: 'Shota put this book on that book, and that had happened before.'
 b. RES: 'Shota put this book on that book, and this book had been on that one before.'

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8. Ora Matushansky pointed out (p.c.) one more supporting argument: Russian has other repetitive adverbs in addition to *opjat'* (e.g., *snova*, *vnov*), and all of them are also able to look inside the decomposition structure.
9. Bondarenko (2018) shows that restitutive readings are available with locative applicatives ("N-applicatives" in the terminology of Pshekhotskaya 2012, a subtype of "Possessive PP Complex" in the terminology of Matushansky et al. 2020)—sentences in which a dative phrase forms a constituent with a PP—and proposes that in these constructions datives are applied arguments introduced on top of the PP that introduces a stative subevent into the syntactic representation. She also shows that in some sentences with high, non-subcategorized datives restitutive readings are possible, but the dative argument is not a participant of the result state that is being repeated.

In (18) we see that the verb ‘put’ takes an object and a PP as its arguments. In (19) the PP argument seems to be promoted to the indirect object position, which is marked on the verb by the presence of the vowel *a*-preceding the root. When *isev* ‘again’ combines with verbs that undergo such an alternation, both repetitive and restitutive readings are available independently of whether the locative argument is expressed as a PP or as a dative argument. Under the restitutive reading in (18)-(19) only the state of one book being on top of the other is being repeated, not the event of Shota putting one book on top of the other. (20) presents another example of the restitutive reading with a locative applicative:

- (20) **Context (RES):** This dress always had all the buttons. But yesterday Nino accidentally tore one of the buttons off the dress.
 nino-m yili **k’aba-s** isev mi-a-k’er-a
 Nino-ERG button.NOM **dress-DAT** again PVB-PV-sew-AOR.3SG
 OK ‘Nino sewed the button to the dress again (the button had been on the dress before).’

The context in (20) supports the restitutive reading, where only the state of the button being on the dress is what is being repeated. Thus, Georgian shows us that dative arguments vary even within one language in whether repetitive adverbs like *again* can receive restitutive readings in sentences with them. This supports the verb sensitive approach to ditransitives (Rappaport Hovav & Levin 2008; Boneh & Nash 2017), according to which the structures of sentences with dative arguments are not all uniform, but depend on the verb that is used.

The crosslinguistic and intralinguistic variation discussed above raises a number of questions. First, what is the explanation for the gap in the table 1: why is the restitutive reading always available with indirect objects that are expressed as prepositional phrases? Is this an accident of our sample, or is there a deeper reason behind it? Second, what determines whether ditransitives with (dative) DPs allow restitutive readings of repetitives? How are sentences with verbs like *give* different in Georgian, Hungarian and Russian on the one hand, and English, German, and Mandarin on the other hand? Finally, what gives rise to the intralinguistic variation: why do different constructions with indirect objects within a single language sometimes differ in whether or not they allow restitutive readings? Why are locative applicatives in Georgian different from dative arguments of verbs like *give*? Léa Nash (2016a) showed that, unlike in some other constructions with dative arguments in Georgian, in locative applicatives the indirect object is structurally lower than the direct object, as evidenced by the contrast in the reciprocal binding in (21).

- (21) linč-ma mi-a-k'er-a ertmanet-s_i dauk'avširebeli episod-eb-i_i
 Lynch-ERG PVB-PV-sew-AOR.3SG each.other-DAT unrelated episode-PL-NOM
 /*episod-eb-s_i ertmanet-i_i
 /episode-PL-DAT each.other-NOM
 'Lynch sewed unrelated episodes to each other.'

She suggests that dative arguments like in (19) and (20) are generated inside of a PP structure, unlike benefactive datives. I will show that if Nash's analysis is correct, we can provide a uniform explanation for the crosslinguistic generalization (table 1) and for the variation in availability of restitutive readings in different ditransitive structures of Georgian.

3. Semantics of repetitives

In this paper I adopt a structural ambiguity ("syntactic") approach to the semantics of repetitive adverbs (von Stechow 1996; Beck & Johnson 2004; Beck 2005; Alexiadou et al. 2014; Lechner et al. 2015, a.o.). This approach attributes the different readings of adverbs like *again* to their different attachments in the syntactic representation. The semantics of repetitive adverbs is taken to be always the same and involve repetition of some event. The different readings of *AGAIN* reflect its modification of different constituents in the syntactically represented lexical decomposition: predicate of events that the constituent modified by the adverb denotes is understood as being true of some prior event. The denotation of *AGAIN* is presented in (22).

- (22) $[[\text{AGAIN}]] = \lambda P \in D_{vt}, \lambda e \in D_v: \exists e' \in D_v [e' <_T e \ \& \ P(e')]. P(e),$
 where D_v is the domain of events, D_{vt} is the domain of predicates of events,
 and $<_T$ is the relation of temporal precedence.

The repetitive adverb takes a predicate of events P and an event e as its arguments. It asserts that the predicate P is true of e , and introduces a presupposition that there is some event e' that temporally precedes e of which P is true as well. To see how the meaning in (22) gives rise to both repetitive and restitutive interpretations, consider the example in (23) with a lexical accomplishment 'open.' The LF for (23) is presented in (24).¹⁰

10. Given that *AGAIN* can in principle attach to any predicate of events, there are three possible attachments of the adverb in the structure: VoiceP (the *REP* reading), SC (the *RES* reading), and *vP*—the intermediate reading according to which the door was caused to be open before, but not necessarily by the same Agent. The intermediate reading has been argued to exist (von Stechow 1996; Paslawska 1998; Bale 2005; Lechner et al. 2015, a.o.), but I will not discuss it in this paper, as it cannot inform us about the structure of ditransitives.

- (23) Ali Baba opened Sezam again.
 a. REP: 'Ali Baba opened Sezam, and that had happened before.'
 b. RES: 'Ali Baba opened Sezam, and Sezam had been open before.'
- (24) LF for (23)



As we see, the verb 'open' in (24) is decomposed in syntax into several projections: small clause (SC) is a projection that corresponds to the result state of Sezam being open (25), vP introduces the subevent that causes the result state to occur (26), and VoiceP introduces the Agent of this causing subevent (27). The small clause is combined with v by Principle R (Beck 2005), (28), which "glues" the causing subevent and the resulting state together by introducing the BECOME (29) and CAUSE components of the meaning.

- (25) $[[\text{open Sezam}]] = \lambda s \in D_v, \text{open}(\text{Sezam})(s)$
 (26) $[[v]] = \lambda e \in D_v, e \text{ is a causing event}$
 (27) $[[\text{Voice}]] = \lambda P \in D_{vt}, \lambda x \in D_e, \lambda e \in D_v, P(e) \ \& \ \text{Agent}(e)=x$
- (28) **Principle R** (adapted from (Beck 2005:7))
 If $\alpha = [V_\gamma \ SC_\beta]$ and $[[\beta]] \in D_{vt}$ and $[[\gamma]] \in D_{\langle e_1 \dots e_n, \langle v, \langle v \rangle \rangle \rangle}$ (an n-place predicate), then
 $[[\alpha]] = \lambda x_1 \dots \lambda x_n. \lambda e. [[\gamma]](x_1)(x_n) \dots (e) \ \& \ \exists e' [\text{BECOME}([[\beta]])(e') \ \& \ \text{CAUSE}(e')(e)]$
- (29) $[[\text{BECOME}]](P)(e) = 1$ iff e is the smallest event such that P is not true of the prestate of e but is true of the result state of e.

This results in the meanings for vP and VoiceP in (30) and (31) respectively. VoiceP denotes a predicate of events whose Agent is Ali Baba and that cause another event e' which is the smallest event such

- (30) $[[vP]] = \lambda e \in D_v, \exists e' [\text{BECOME}(\lambda s, \text{open}(\text{Sezam})(s))(e') \ \& \ \text{CAUSE}(e')(e)]$
 (31) $[[\text{VoiceP}]] = \lambda e \in D_v, \exists e' [\text{BECOME}(\lambda s, \text{open}(\text{Sezam})(s))(e') \ \& \ \text{CAUSE}(e')(e)] \ \& \ \text{Agent}(e)=\text{Ali Baba}$

that Sezam is not open before it occurs but is open as its result.

In the LF in (24) there are at least two possible attachment sites for the repetitive adverb: the small clause (SC) and VoiceP.¹¹ Attaching AGAIN to VoiceP will result in the repetitive reading:

- (32) [[AGAIN VoiceP]] under the REP reading: for any event e
- a. is defined iff *presupposition*
 $\exists e'' \in D_v [e'' <_T e \ \& \ \exists e''' [\text{BECOME}(\lambda s. \text{open}(\text{Sezam})(s))(e''') \ \& \ \text{CAUSE}(e'')(e'')] \ \& \ \text{Agent}(e'') = \text{Ali Baba}].$
 - b. when defined, is true iff *assertion*
 $\exists e' [\text{BECOME}(\lambda s. \text{open}(\text{Sezam})(s))(e') \ \& \ \text{CAUSE}(e')(e) \ \& \ \text{Agent}(e) = \text{Ali Baba}]$

Under this reading, [[AGAIN VoiceP]] will be true of all events e that are events of Ali Baba causing Sezam to become open such that there is an event that temporally precedes them which is also an event of Ali Baba causing Sezam to become open. Attaching AGAIN to the small clause will give us the restitutive reading:¹²

- (33) [[AGAIN SC]] under the RES reading: for any event s
- a. is defined iff *presupposition*
 $\exists s' \in D_v [s' <_T s \ \& \ \text{open}(\text{Sezam})(s')]$
 - b. when defined, is true iff *assertion*
 $\text{open}(\text{Sezam})(s)$

Under the restitutive reading, the sentence will be true iff Ali Baba caused Sezam to become open, and there is a state prior to this result state of Sezam being open. The sentence will be false if there is a prior state of Sezam being open, but it's not true that Ali Baba caused Sezam to become open this time. It will be undefined otherwise.

An attractive feature of this analysis of repetitive adverbs is that it allows us to explain why possible interpretations of AGAIN are sometimes sensitive to word order (see section 2). The same dependence on the word order that we saw in (1)-(2) with a lexical accomplishment is also observed in ditransitives, cf. (8) and (34).

- (34) ...dass Hans dem Mädchen wieder ein Buch gab.
 ...that Hans the.N.DAT girl again a.N.ACC book gave
 a. REP: '...that Hans gave the girl the book, and that had happened before'
 b. RES: '*...that Hans gave the girl the book, and the girl had had the book before.'

11. As discussed in section 2, the way these two attachments relate to the linear position of repetitive adverbs is not straightforward, as language-specific rules concerning linearization of adjuncts, movement of adverbs and other constituents can affect the resulting word order. The attachments reflect where the adverbs are interpreted.

12. I do not provide the meaning of the VoiceP here to avoid the discussion of the issues of presupposition projection and its interaction with the Principle R. But any mechanism of presupposition projection that ensures that the presupposition of AGAIN projects to the top of the tree should be applicable here.

The structural approach to the REP/RES ambiguity outlined above has the following consequence. Whenever the restitutive reading is available, there has to be some constituent in the syntactic structure that denotes a predicate describing the result state.

4. Proposal: restitutive readings reveal the PP structure

In section 2 we have seen that restitutive readings of repetitives are available in some, but not all ditransitive configurations, both across and within languages. Under the syntactic approach to the REP/RES ambiguity, this implies that only some ditransitives have a constituent that corresponds to the result state of the predicate. I conjecture that complement PPs are such constituents: when they are present in ditransitive configurations, they introduce the predicate of states that *AGAIN* can modify. Thus, the gap in the table 1 is not an accident: languages in which indirect objects are encoded as complement PPs will always have a constituent (PP) that denotes a predicate describing the result state, and thus will always have restitutive readings.

I would like to propose that the variation in whether dative arguments receive restitutive readings results from the fact that some of the indirect object DPs originate in structures with silent complement PPs. The fact that not all structures with dative arguments allow restitutive readings suggests that a structure with a PP is not the only possible ditransitive configuration. There are dative DPs that are true arguments and are not part of any constituent that excludes the verb. These two ways in which structures with dative arguments differ give rise to the observed variation in the availability of restitutive readings.

Following (Beck & Johnson 2004), I propose that the result states of ditransitives are states of the individual denoted by the direct object being in the possession of the individual denoted by the indirect object or at the location specified by it (35). These states are introduced into the syntactic structure by PP structures, and can combine via Principle R with the verb.

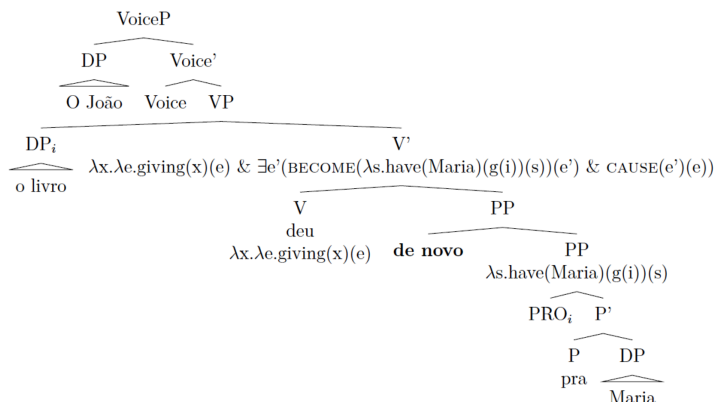
- (35) **Result state of a ditransitive:** $\lambda s. \text{have}(\text{IO})(\text{DO})(s)$
 ‘the state of the direct object being in the possession of or at the indirect object’

The PP structures denoting result states are present in languages in which indirect objects are expressed as overt prepositional phrases and in some of the languages with dative DPs, but not in others. The sections that follow spell out the details of the proposal for languages of each kind.

4.1. Languages with overt PPs

In languages with overt PPs as indirect objects (Brazilian Portuguese, French, Italian) and in English *to*-PP construction, the LF for the sentences like in (3), repeated here as (36), is in (37)

- (36) O João deu o livro de novo pra Maria *Brazilian Portuguese*
 the John give.3SG.PST the book again to.the Maria
 a. REP: 'John gave Maria the book, and that had happened before.'
 b. RES: 'John gave Maria the book, and Maria had had the book before.'
 (37) LF for (36)



The PP structure relates with the *have* relation the individual denoted by the indirect object (Maria) to a pronoun that is co-indexed with the direct object and receives the same interpretation as it does (refers to the book in (37)) via the assignment function g .^{13 14}

- (38) $[[PP]]^g = \lambda s. have(Maria)(g(i))(s) = \lambda s. have(Maria)(\lambda x(book(x)))(s)$

The result state denoted by the PP corresponds to the final state in which the individual denoted by the direct object finds itself in at the end of the eventuality that is caused by the subject. Depending on the verb, this result state might be a state of possession or a state of arrival, and furthermore can be actual or only prospective (Rappaport Hovav & Levin 2008; Beavers 2011).

13. An alternative possible analysis could be that the direct object originates inside of the PP and then moves out.

14. This meaning for the PP is likely an oversimplification: there are reasons to believe that directional PPs like the ones we see in ditransitive constructions denote paths rather than just states (e.g., see Svenonius 2012; Zwarts 2013). The essence of the current analysis however can be preserved as long as

the ditransitive had held before, i.e., (36) will be defined if there had been a prior state of Maria having the book. The PP then combines via the Principle R with the verb, which denotes a function that takes an individual x and an event e and returns true iff e is an event of giving x . After that the direct object and the external argument are combined (the latter does so via the Voice head), and the assertive component of the VoiceP receives the denotation in (40). The event variable of VoiceP will then be existentially closed.

- (40) $[[\text{VoiceP}]]^g = \text{for any event } e, \text{ when defined, true iff}$
 $\text{giving}(\lambda x(\text{book}(x))(e) \ \& \ \exists e'[\text{BECOME}(\lambda s. \text{have}(\text{Maria})(\lambda x(\text{book}(x)))(s))(e') \ \& \ \text{CAUSE}(e')(e)).$

Provided that the sentence is defined (there was a prior state of Mary having the book), it will be true iff there is an event of giving the book, which causes the event of becoming whose result state is the state of Maria having the book.

Thus, under the current analysis the languages with overt PP complements as indirect objects are expected to always have the restitutive reading due to having a constituent in the syntactic representation that describes the result state and that repetitive adverbs can modify.

4.2. Languages with (dative) DPs that are PPs in disguise

I propose that in languages like German and Mandarin, and in English double object construction there is a silent PP present in ditransitive constructions with (dative) DPs. I assume that the structure is the same as in (37) but for the two differences: the preposition is null,¹⁶ and the indirect object, which is the complement of the preposition, undergoes further movement to a position above the theme argument. There are no differences as far as the semantic interpretation is concerned: as long as there is a (phonologically null) PP describing the result state in the syntactic representation, *AGAIN* will be able to attach to it and introduce the restitutive presupposition. Thus, the restitutive readings will be possible.

This analysis has been previously independently proposed for the English double object construction (McIntyre 2011). Here is one of

16. One could hypothesize that the preposition gets incorporated into the verb in such constructions (Larson 1988; Baker 1988a; Baker 1988b). While this is a plausible hypothesis, I do not commit here to it (see also Emonds & Whitney 2006 for a critical discussion).

the arguments that McIntyre provides. The double object construction in English cannot co-occur with complement PPs:¹⁷

- (41) a. *I passed the patient a tray to his bed. (McIntyre 2011:3)
 b. *I threw Fred a ball into his hands.
 c. *They sent her a doctor into the building.

This complementary distribution of complement PPs and indirect objects might be surprising if the double object construction is unrelated to the *to*-PP construction, but it is expected if the indirect object is base-generated inside of a silent PP. Given that a single verb cannot have two complement PPs at the same time, if there is a silent complement PP in the double object construction, the ungrammaticality of the sentences in (41) follows.

It does not have to be the case that all ditransitive configurations are alike in (not)-having a (silent) complement PP in their structures. As we have seen, while Georgian ditransitives with verbs meaning ‘give,’ ‘send,’ ‘return’ don’t allow restitutive readings, dative arguments in sentences with the so-called locative version (that occurs, e.g., with verbs like ‘put’ or ‘tie’) do. This contrast can be explained if we follow Nash’s (2016a) proposal that dative arguments in Georgian locative applicatives, unlike other kinds of datives, are generated inside of a complement PP.¹⁸ Thus, restitutive readings in sentences with locative version are expected.

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17. Russian, which lacks restitutive readings in ditransitives with dative arguments, differs from English in allowing dative DPs and complement PPs to co-occur (Bondarenko 2018). This seems to happen in two circumstances: either when the dative DP is a higher, non-core argument, or when it forms a constituent with the PP (Pshehotskaya 2012; Matushansky et al. 2020). For the latter case, we might hypothesize that in Russian the combination of a dative argument and a PP denote a single path which the direct object travels, but in English indirect objects describe paths that are distinct from those introduced by PPs. In that case, co-occurrence of an indirect object and a PP would violate the Unique Path Constraint proposed by Goldberg (1991) in English, but not in Russian (I thank Ora Matushansky for discussion of this idea). It would be interesting to see if there is a correlation between the lack of restitutive readings in ditransitives and the ability of a dative to be an applied argument within PP across languages.
18. However, in Georgian locative applicative construction the indirect object does not undergo further movement to a position above the theme argument as it does in English double object construction, see (21) from (Nash 2016a).

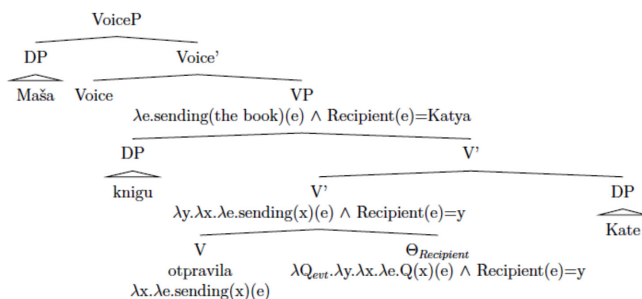
4.3. Languages with true (dative) DPs

I propose that in languages like Georgian, Hungarian, and Russian, (dative) indirect objects that occur with verbs such as ‘give’ and ‘send’ are not part of a complement PP,¹⁹ and thus there is no syntactic constituent that describes the result state of the ditransitive verb that the repetitive adverb could attach to and give rise to the restitutive reading.

How does then the verb combine with the indirect object in sentences like (42)? While there are multiple options in principle available, Boneh & Nash’s (2017) showed that dative arguments with verbs like *give* in Russian can be structurally lower than the theme. So here I explore an option that would be compatible with the low structural status of the dative argument. I propose that sentences like in (42) can have a structure as in (43).²⁰

- (42) Maša opjat’ otpravila Kate knigu. Russian
 Masha again sent Katya book
 a. REP: ‘Masha sent Katya the book, and that had happened before.’
 b. RES: *‘Masha sent Katya the book, and Katya had had the book before.’

- (43) LF for (42)



19. While this goes against what Boneh & Nash (2017) are proposing, they argue for a defective, minimal PP structure. This might be compatible with the current proposal, as long as that PP does not denote a predicate of states of the theme argument being in the possession of the individual denoted by the indirect object. It could be that such a minimal PP is combined via the theta-projection with the verb before the theme argument, as in (43).
20. An anonymous reviewer asks what rules out an analysis such as in (43) for languages like English. The crucial feature of (43) is that it does not have a constituent that denotes the result state of Katya having the book, and so it predicts that restitutive readings of *again* should be impossible, whereas we have seen that they are available in English, (6)-(7). Strictly speaking, this does not preclude English from having a structure in (43), but it means that English certainly has a different structure available—one in which there is a constituent denoting result state.

In (43) we see that the verb (44a) first combines with a functional head $\Theta_{\text{Recipient}}$ (44b), which introduces the indirect object as the Recipient argument of the eventuality denoted by the verb (44c), and only then the resulting constituent combines with the direct object. After the external argument is introduced via Voice, and the event argument of the verb is existentially closed (44d), the sentence in (42) will be true iff there is an event of sending the book whose Recipient is Katya and whose Agent is Masha.

- (44) a. $[[\text{otpravila}]] = \lambda x. \lambda e. \text{sending}(x)(e)$
 b. $[[\Theta_{\text{Recipient}}]] = \lambda Q_{\text{evt}}. \lambda y. \lambda x. \lambda e. Q(x)(e) \ \& \ \text{Recipient}(e)=y$
 c. $[[V']] = \lambda x. \lambda e. \text{sending}(x)(e) \ \& \ \text{Recipient}(e)=\text{Katya}$
 d. $[[\text{VoiceP}]] = 1$ for any event e iff
 $\text{sending}(\text{tx}(\text{book}(x)))(e) \ \& \ \text{Recipient}(e)=\text{Katya} \ \& \ \text{Agent}(e)=\text{Masha}$

The first node in the syntactic representation that *opjat* 'again' could possibly attach to is VP. Under such attachment, we will get a reading according to which what is being repeated is an event of someone sending the book to Katja. (42) does indeed have such a reading, in addition to a perhaps more salient one where the whole event had occurred again (this would be the reading if *opjat* attaches to VoiceP). However, there is no constituent in (43) that denotes a predicate of states of Katja having the book, leading to the absence of the restitutive interpretation.

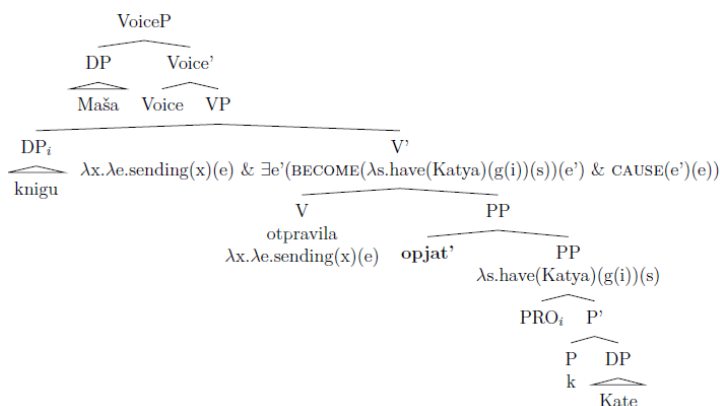
A curious fact about Russian ditransitives is that combining verbs like 'give' and 'send' with overt complement PPs instead of dative arguments makes a difference for the interpretation of repetitive adverbs. As (45)-(46) show, the restitutive reading of *opjat* becomes available if the complement of a ditransitive verb is encoded as a prepositional phrase.²¹

- (45) rukovoditel' opjat' otpravil sotrudnika v Moskvu (Bondarenko 2018:38)
 manager again sent employee.ACC in Moscow
 a. REP: 'The manager sent the employee to Moscow, and that had happened before.'
 b. RES: 'The manager sent the employee to Moscow, and the employee had been in Moscow before.'
- (46) Maša opjat' otpravila knigu Kate /k Kate. (Bondarenko 2018:38)
 Masha again sent book.ACC Katja.DAT /to Katja.DAT
 a. REP: ^{OK}DP, ^{OK}PP 'Masha sent Katja the book, and that happened before.'
 b. RES: *DP, ^{OK}PP 'Masha sent Katja the book, and Katja had had the book before.'

21. An anonymous reviewer asks whether this generalization holds across the board, or if it depends on specific verbs: e.g., one could imagine that verbs that more clearly imply change of location, like *bring*, *throw* and *return*, could allow restitutive readings with a bare dative DP. From the data I have, it seems that the generalization holds across the board: I have not been able to find verbs that allow restitutive readings with bare dative DPs.

This is expected under our proposal. I take the denotations of ditransitive verbs to be uniform across different languages, and thus when a PP is combined with a verb like *otpravil'* 'send' in Russian, it starts behaving exactly like languages with complement PPs as indirect objects (Brazilian Portuguese, French, Italian) do. The verb combines with a PP via the Principle R, as is illustrated in (47), and the presence of a PP denoting a predicate of states of Katja having the book in the structure allows *opjat'* to modify it and produce the restitutive interpretation.

(47)



5. Conclusion

In this paper I have shown that ditransitive constructions differ both across and within languages in whether they allow restitutive readings of adverbs like *again*: while ditransitives in which indirect objects are encoded as (dative) DPs can both have and lack restitutive readings, ditransitives with complement PPs seem to always allow restitutive readings of repetitives. I proposed that this is so because PPs introduce result states of ditransitives into the lexical decomposition in syntax which repetitive adverbs can modify, and because some of the constructions with indirect object DPs have silent PP complements in their structure. If this proposal is on the right track, then the availability of the restitutive reading for adverbs like *again* that generally have the ability to “look” into the lexical decomposition of predicates, can be used as a diagnostic for distinguishing true (dative) indirect object DPs from PPs in disguise.

