

## VARIATION IN REPETITIVE MORPHEMES: SOME IMPLICATIONS FOR THE CLAUSAL ARCHITECTURE

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### 1. GOALS

Repetitive constructions constitute an important tool for understanding (i) abstract decomposition of verbal predicates and (ii) the syntax of verb movement:

- Cross-linguistic *typology* of repetitive morphemes in Germanic (English, German), Greek and Romance (French, Italian).
- *Methodology*: isolating readings requires securing informative entailment patterns.
- Evidence for *three-way ambiguity* of *again* (and its cousins in other languages).
- Third reading of *again* indicates two separate *functional heads* in vP-domain (vP and VoiceP).
- Systematicity of correlations between interpretation and serialization provides evidence for cross-linguistic differences in height of *verb movement* and the *functional hierarchy* in (1):

(1) [CP ... [TP ... [PerfectP ... [VoiceP ... [vP ... [ResultP ... ]]]]]]

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### 2. EVENT REPETITION AND SYNTACTIC DECOMPOSITION

#### 2.1. THE REPETITIVE-RESTITUTIVE AMBIGUITY

Sentences with *again* are ambiguous (Marchand 1976; McCawley 1976; Dowty 1979; Wechsler 1989; von Stechow 1995, 1996; Pawlowska 1998; Beck & Johnson 2004; Bale 2005; Nissenbaum 2007; i.a.):

- (2) Sally opened the door again.
- a. Sally opened the door, and she had opened the door before. *repetitive (REP)*
  - b. Sally opened the door, and the door had been open before. *restitutive (RES)*

Both readings assert that Sally opened the door, but differ in the presuppositions they trigger:

- (3) a. Presupposition of REP: there was a previous door opening event with Sally as agent.  
b. Presupposition of RES: there was a previous state of the door being open.

Differences in presuppositions are determined by the semantic scope of *again*, which corresponds to its surface c-command domain (*prejacent*; von Stechow 1995, 1996).

(4) [again] =  $\lambda P \lambda e. P(e): \underbrace{\exists e' < e}_{\text{assertion}} \ \& \ \underbrace{P(e')}_{\text{presupposition}}$

- (5) a. Typed domain includes eventualities of type *s*.  
b. Metalinguage *s* serves as designated variable for states and *e* ranges over events proper.
- (6) a. REP: *again* scopes above a node including the subject.  
 $\text{again}(\lambda e. \text{open}(\text{the door})(e) \ \& \ \text{Agent}(\text{Sally})(e))$   
b. RES: *again* is attached to the minimal node expressing the resultant state.  
 $\text{again}(\lambda s. \text{open}(\text{the door})(s))$

## 2.2. ENTAILMENTS

REP = (entails) RES. Thus, it is impossible to find scenarios that verify REP only.<sup>1</sup> Evidence for the existence of a separate representation for REP reading comes from two different sources:

I. Downward entailing (DE) contexts reverse entailments (Ruys 1992). If the door was built open, was closed and then opened again by the wind, (7)a is judged as true on REP but false on RES.

- (7) *Downward entailing environments* *RES = REP*  
 a. John didn't open the door again.  
 b. Nobody/at most three candidates opened the door again.

*Presupposition projection.* Negation is part of the presupposition in (8), but not in (9), indicating that the surface position of *again* regulates the size of the presupposition.<sup>2</sup>

- (8) Again, John didn't open the door.  
*Presupp:* There is a previous event in which John didn't open the door.
- (9) John didn't open the door again.  
 a. \**Presupp:* There was a previous event in which John had *not* opened the door.  
 b. *Presupp:* There was a previous event in which John had opened the door.

II. Variable binding. If the subject binds a *de se* pronoun ((10)), RES is blocked, since all previous states satisfying the presupposition need to include the subject binder of the *de se* pronoun. This new diagnostic confirms the existence of REP.

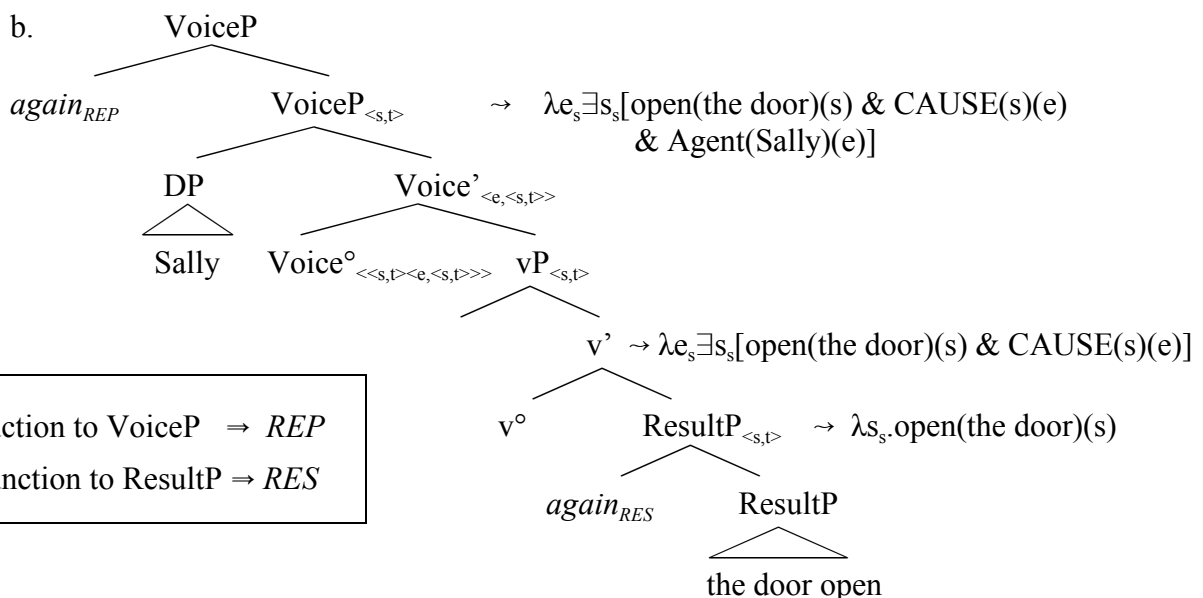
- (10) *VP-internal de se variables*  
 a. John did *his* best again.  
 b. Sam has (again) found *his* balance (again).  
 c. Sally gave us *her* best performance again.

## 2.3. AN ARGUMENT FOR DECOMPOSITION IN SYNTAX

Lexical decomposition is reflected in syntax (von Stechow 1995, 1996). *Open* is decomposed into the adjective *open*, which denotes a resultant state, and abstract heads expressing causation and introducing the subject (Alexiadou, Anagnostopoulou & Schäfer [AAS] 2006, to appear).

- (11) a.  $v^\circ$  + Result translates into CAUSE. (AAS 2006; AA 2010)  
 b. Voice introduces the external argument.

- (12) a. Sally opened the door.



- (13) *Two functional heads inside verbal projection* (AAS 2006; t.a.; Marantz 2007; Ramchand 2008)
- a.  $v^\circ$  hosts Kratzer's (2004) *Causative Shift* operator, which turns predicates of states (ResultP) into predicates of events (Voice $^\circ$ ), and introduces CAUSE.
  - b. *Voice $^\circ$*  introduces the external argument, either by being defined as the 'applicative' functor (14), (58)b or by Event Identification, as in Kratzer (2004).
- (14) a.  $[[v^\circ]] = \lambda P_{\langle s,t \rangle} \lambda e_s \exists s_s [P(s) \& \text{CAUSE}(s)(e)]$  (adopted from Kratzer 2004: (59))  
 b.  $[[\text{Voice}^\circ]] = \lambda P_{\langle s,t \rangle} \lambda x \lambda e. P(e) \& \text{Agent}(x)(e)$  (CAUSE suppressed unless relevant.)

Evidence for syntactic decomposition (von Stechow 1996): the availability of the restitutive reading depends on the syntactic context. In German, restitutive *wieder* 'again' is possible only if *wieder* follows the direct object.

- (15) (weil) Satoshi die Tür *wieder* öffnete REP/RES  
 because Satoshi the door again opened
- (16) (weil) Satoshi *wieder* die Tür öffnete REP/\*RES  
 because Satoshi again the door opened

*Von Stechow's analysis*: The direct object in German obligatorily moves to a high position (SpecAgrO) above VoiceP. Thus, the order *wieder* - *object* is compatible with *wieder*<sub>REP</sub> only. On the other hand, when *wieder* follows the object, it may take scope above or below VoiceP.

English: Beck & Johnson demonstrate that the German facts can also be reproduced in English:

- (17) Thilo opened the door *again*. REP/RES
- (18) Thilo *again* opened the door. REP/\*RES

In (17), *again* can right-adjoin to ResultP, deriving a restitutive reading, or to VoiceP, yielding a repetitive reading. By contrast, in (18) the adjunction site of *again* must include VoiceP ((19)):

- (19)  $[_{TP} \text{Thilo}_1 [_{\text{VoiceP}} \textit{again}_{REP} [_{\text{VoiceP}} t_1 \text{open}_2 [_{\text{VP}} [_{\text{ResultP}} t_2 \text{the door}]]]]]$
- (20) *Assumption*: In English, the verb moves to Voice $^\circ$  overtly (Johnson 1991; Lasnik 2003)

#### 2.4. SUBJECTLESS AND INTERMEDIATE READINGS

The decomposition analysis predicts an additional reading for *again* and *wieder* (von Stechow 1996; Paslawska 1998; Bale 2005; AAS, t.a.). In fact, two have been identified in the literature:

- (21) Sally opened the door again.
- (22) a. *REP*  
 $\textit{again}(\lambda e_s \exists s_s [\textit{open}(\text{the door})(s) \& \text{CAUSE}(s)(e) \& \text{Agent}(\underline{\text{Sally}})(e)])$   
*Presupp*: There is a previous opening event and a resultant state with the same agent.
- ☞ b. *subjectless reading* (von Stechow 1996; Paslawska 1998; Bale 2005)  
 $\textit{again}(\lambda e. \textit{open}(\text{the door})(e) / (\lambda e_s \exists s_s [\textit{open}(\text{the door})(s) \& \text{CAUSE}(s)(e) \& \text{Agent}(\underline{x})(e)]])$   
*Presupp*: There is a previous opening and a resultant state with possibly different agent.
- ☞ c. *intermediate reading* (INT; AAS, t.a.)  
 $\textit{again}(\lambda e_s \exists s_s [\textit{open}(\text{the door})(s) \& \text{CAUSE}(s)(e)])$   
*Presupp*: There is a previous opening and a resultant state without agent.
- d. *RES*  
 $\textit{again}(\lambda s_s. \textit{open}(\text{the door})(s))$   
*Presupp*: There is a previous resultant state of the door being open.

2.4.1. Subjectless readings

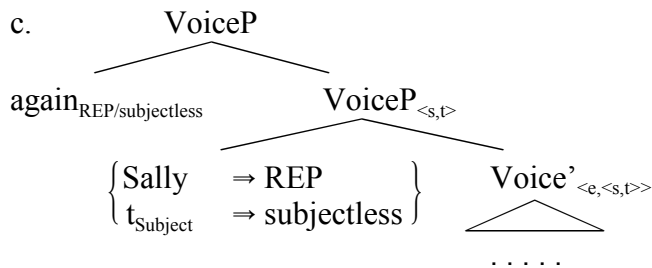
- (23) *Diagnosing the subjectless reading* (Bale 2005: (8))
- a. *Context*: Sally’s dryer broke. She called a repair-man who simply hit the dryer until it started working. Two days later, the dryer broke down again. So...
  - b. Sally hit the dryer again.
  - c. #Again, Sally hit the dryer.

For Bale, *again* scopes over the bare eventuality. But this makes the reading structurally indistinguishable from RES. Thus, (25)a is falsely predicted to admit the mixed subjectless - RES interpretation in (25)c.

- (24) a. Sally [<sub>VP</sub> [<sub>VP</sub> hit the dryer] again]  
 b. [[<sub>VP</sub> [<sub>VP</sub> hit the dryer] again]] = [[again]](λe.hit(the dryer)(e))
- (25) a. *Context*: The repair-man hit the dryer, while the wind opened the door to the room. Two days later, the dryer broke down again. So...  
 b. Sally hit the dryer again and opened the door again. *subjectless - RES*  
 c. #Sally hit the dryer and opened the door again. *\*subjectless - RES*

Alternative analysis for subjectless reading:

- (26) a. Subjectless: *again* attaches to VoiceP, subject moves. Subject variable is captured by existentially closing presupposition.  
 b. REP: same tree as for subjectless reading, except that subject reconstructs, and therefore is part of presupposition.



- d. again(λe.open(the door)(e) ∧ Agent(x)(e))

Evidence for severing the external argument: Assume that the external argument is part of a verb meaning of type <e,<e,t>>. Then, it should be possible to attach *again* at the VP-level and derive sloppy readings for the presupposition. But such readings are absent, (28) cannot express (28)b.

- (27) [[again]] = λP\_{<e,st>} λxλe.P(x)(e): ∃e'<e & P(x)(e')
- (28) John<sub>1</sub> [<sub>VP</sub> [<sub>VP</sub>, <e,st> did his<sub>1</sub> best] again].  
 a. There was a previous event, in which John did his best.  
 b. \*There was a previous event, in which someone did his best.
- (29) a. *Context*: Sally’s dryer broke. She went to her neighbor’s house, who showed her how to fix it by hitting her own dryer until it started working. Two days later, Sally’s dryer broke down again. So... (adapted from Bale 2005)  
 b. #Sally<sub>1</sub> hit her<sub>1</sub> dryer again.

*Conclusion*: There is no property attachment site ((12)). The prejacent of *again* excludes the Agent.

2.4.2. Intermediate readings

In contexts that do not introduce an agent (unaccusative *tip over*), continuations with *wieder* are infelicitous ((30)b). Additive focus particle *nochmal* ‘another time’ is felicitous (see Rapp & von

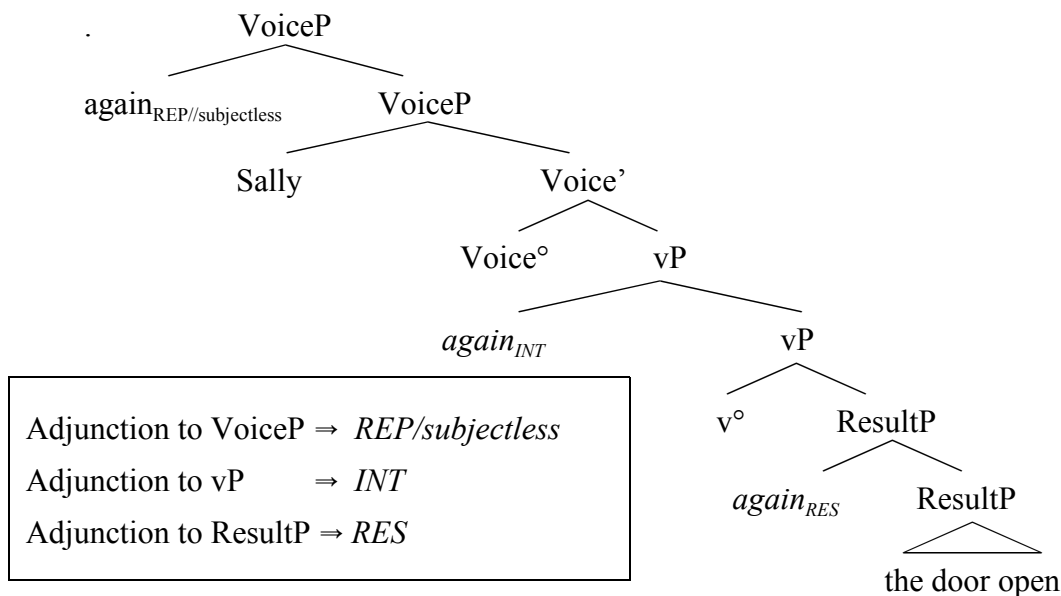
Stechow 1999 for the observation that not all adverbs admit all scope readings).<sup>3</sup>

- (30) *Diagnosing INT* (AAS, t.a.)
- Context*: Das Regal ist schon mehrmals (von selbst) umgekippt.  
'The shelf has tipped over already a number of times (by itself)'
  - #Jetzt hat Paul (*wieder*) das Regal (*wieder*) umgekippt.  
now has Paul again the shelf again over-tipped  
'Now, Paul tipped over the shelf again'
  - Jetzt hat Paul (?*nochmal*) das Regal (*nochmal*) umgekippt.  
now has Paul the shelf again over-tipped  
'Now, Paul tipped over the shelf again'

(31) *Hypothesis*: *wieder* lacks INT.

(32) *Conjecture*: The subjectless reading and INT are structurally distinct.

(33) *Attachment sites for 'again'*



(34) *Methodological consequence*

If a sentence S lacks REP, it does not warrant the conclusion that S is interpreted as RES.

### 3. THE ENGLISH PREFIX RE-

Stressed *re-* (*re-FTP*, *renazify*) has been claimed to admit RES only. *Re-* signifies that the result state of an accomplishment has been restored (Marchand 1960; Dowty 1979; Wechsler 1989).

- (35) a. John opened the door again. *REP/RES*  
 b. John reopened the door. *\*REP/RES*
- (36) a. John entered the Soviet Union again. *REP/RES*  
 (RES: John was born in the Soviet Union, left and returned)  
 b. Again John entered the Soviet Union. *REP/\*RES*  
 c. John reentered the Soviet Union. *\*REP/RES*

*Prediction*: If *re-* lacks REP, *re-* should be incompatible with contexts in which subjects bind *de se* pronouns (and which require REP). Thus, (37) should - counter to fact - be ill-formed:

- (37) a. Everybody<sub>1</sub> rearranged his<sub>1</sub> furniture.  
 b. Nobody<sub>1</sub> reopened his<sub>1</sub> door.  
 c. Most<sub>1</sub> regained their<sub>1</sub> original weight.

## 3.1. RE- VS. RESTITUTIVE AGAIN

The prefix *re-* differs in various respects from *again*<sub>RES</sub> (see also Williams 2011):

○ *Re-*, unlike *again*, requires an underlying object ('Horn's 1980 generalization' in Marantz 2007):

(38) I reopened the door/repainted the house/rearranged the furniture.

(39) a. \*I resmoked/relaughed/resang/resmiled.  
b. I smoked/laughed/sang/smiled again.

(40) a. The stain reemerged/reappeared.  
b. The door reopened.

○ *Re-* only combines with telic predicates:

(41) a. \*I repushed the cart.  
b. \*I repeted the cat.

○ *Re-* is incompatible with achievements (Horn 1980; Dowty 1979; Wechsler 1989; Marantz 2007):

(42) a. \*I rekicked the wall.  
b. \*She rereached the top.

○ *Re-* selects for accomplishments (change of state or incremental theme). Curiously, at least with verbs like *read*, *re-* also seem to admit REP/subjectless.

(43) a. John reread the poem.  
*Context:* "[...] at a poetry recital. The speaker could felicitously say that Mary read the poem (aloud) and then John reread it, even if John never read it before.." (Wechsler 1989: 8).  
b. CBS will rebroadcast the game at 5 pm.  
c. We will replay the last tackle in slow motion.

○ *Sole Complement Generalization* (Marantz 2007, based on Wechsler 1989; cf. Levin & Rappaport 1986): *re-* is incompatible with ditransitives and resultatives.

(44) a. John handed her the T-shirt again. *double object predicates*  
b. \*John rehanded her the T-shirt.

(45) a. John put the folder on the table again. *change of location verbs*  
b. \*John reput the folder on the table.

(46) a. Sally drank the teapot dry again *resultatives*  
b. \*Sally drank the teapot dry.

○ *re-* does not combine with oblique objects, it requires the presence of a structurally Case marked DP (Wechsler 1989):

(47) b. John reclimbed the fence.  
a. \*John reclimbed over the fence.

(48) a. John reran the last lap.  
b. \*John reran around the track.

(49) a. John recrossed the dessert.  
b. \*John rewalked across the desert.

3.2. THE SCOPE OF *RE-*

Uninformative scope facts (Williams (2011)): *re-* always takes narrow scope w.r.t. indefinite objects, while *again* also admits narrow scope/surface reading for indefinites (cf. Dobler 2008a/b).

- (50) John repolluted a river.  
 a. There is a river that was previously polluted.  $\exists > re$  (*inverse*)  
 b. \*There was a previous polluting event of a (possibly different) river  $*re > \exists$
- (51) John polluted a river *again*.  
 a. There is a river that was previously polluted.  $\exists > re$   
 b. There was a previous polluting event of a (possibly different) river.  $re > \exists$

*Problem 1 - RES vs. RE*: *re-* in (50) is intended to be interpreted RES, while *again* in (51) seems to be used repetitively. On the RES reading, (51) behaves like (50), though, admitting  $\exists > re$  only.

*Problem 2 - entailments*:  $\exists > re \models re > \exists$ . Whenever there is a river that John polluted, John polluted a river. Hence, there is no situation that would satisfy  $\exists > re$  only, masking the inverse reading.

*Solution*: Downward entailing contexts reverse entailments. (52)a is e.g. true on  $\neg \exists > re$  and false on  $\neg re > \exists$  if John polluted the Danube first, and the River Foss next. Similarity for non-monotone

- (52) a. John didn't repollute a river.  $\neg \exists > re$  /??  $\neg re > \exists$   
 b. John repolluted exactly two rivers.

*Problem 3 - presuppositions of RES*: Assuming that RES presupposition is stated in terms of identity, restoring the resultant state requires keeping the object denotations constant. Hence, the object is expected to necessarily escape the scope of restitutive *again/re-*.

*Possible response*: presupp is defined in terms of identity of state only, excluding participants

Additional scope facts: predicates that do not seem to involve resultant state (but see Wechsler 1989) indicate that wide scope preference is independent of RES.

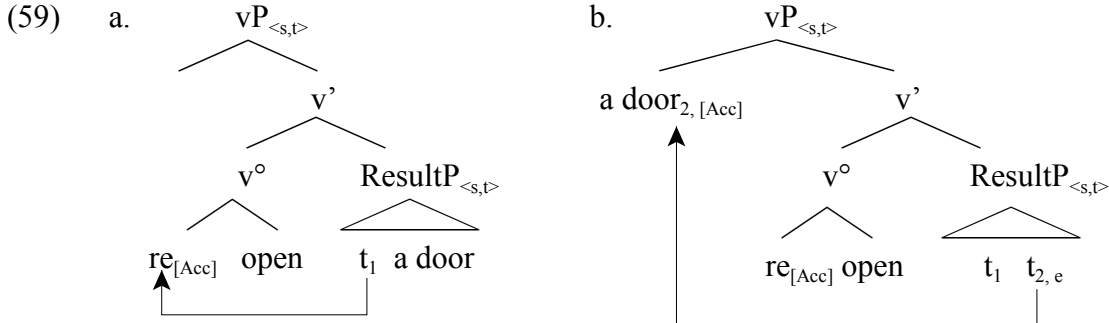
- (53) *Subjectless re-*  
 a. John reread a poem (at the poetry recital).  $*re > \exists/\exists > re$   
 $\Rightarrow$  Somebody had read the poem before.  
 b. John rewrote a letter.  $*re > \exists/\exists > re$   
 $\Rightarrow$  Somebody had written the letter before.
- (54) *REP re-*  
 a. John remarried Mary. (example from Marantz 2007)  
 $\Rightarrow$  John was married before.  
 $\nRightarrow$  Mary was married before.  
 b. John remarried a Greek woman.  $*re > \exists/\exists > re$
- (55) *Conclusion*: indefinite objects scope above *re-*.

## 3.3. ANALYSIS

- (56) *Syntax*  
 a. *re-* is an aspectual head that serves as a lexical exponent of  $v^\circ$  (see also Cinque 1999).  
 b. *re-* bears an accusative Case feature, which is checked subsequent to overt movement of the argument of the result predicate to SpecvP (cf. Alexiadou & Schäfer 2011; on relation between accusative and aspect see also Borer 2005; Kratzer 2002; i.a.)  
 $\rightarrow$  derives DP-object requirement  
 $\rightarrow$  derives wide scope requirement  
 c. The root incorporates into *re-*.

(57) *Semantics*  
*re-* applies to the root meaning ( $\langle s, t \rangle$ ) and an individual. In addition, *re-* introduces accomplishment semantics (CAUSE) and the *again* presupposition.

(58)  $[[re-]] = \lambda P_{\langle e, t \rangle} \lambda x_e \exists s_s \exists s'_s [P(x)(s) \ \& \ \text{CAUSE}(s)(e)]: \exists e' \langle e \ \& \ P(x)(e')$



○ The meaning rule for *re-* derives sole complement generalization, because additional arguments or resultatives cannot be semantically integrated:

- (60) a. \*John rehanded her the T-shirt.  
 b. \*John re-put the folder on the table.  
 c. \*Sally redrank the teapot dry.

○ Oblique objects are excluded by the case requirement as well as the semantics of *re-*:

- (61) a. John re-climbed the fence.  
 b. \*John re-climbed over the fence.

*Open issue:* (37), subjectless reading ((53)) and REP *re-* ((54)) suggest that *re-* is located *above*  $v^\circ$ .

#### 4. TYPOLOGY OF REPETITIVE MORPHEMES I: GREEK

##### 4.1. GREEK *KSANA*

The Greek counterpart of *again* and *wieder*, the adverb *ksana*, is particularly interesting for a number of reasons:

○ It can appear both free and incorporated into the verb (Rivero 1992, Alexiadou 1997):

- (62) a. O Janis anikse ksana tin porta.  
 John opened again the door.  
 b. O Janis ksan-anikse tin porta.  
 John re-opened the door.

○ Non-incorporated *ksana* can occupy a variety of positions interacting with the various word order patterns available in the language (§4.1.1).

○ Due to the free word order of Greek, *ksana* provides further evidence that the REP/RES ambiguity is syntactically resolved.

○ *ksana* provides a diagnostic for locating the surface position of the subject and object (§4.1.1).

○ Incorporated *ksana* differs from free *ksana* in the availability of RES in a high position, indicating that the REP/RES ambiguity interacts with verb movement (§4.1.2).

○ Incorporated *ksana* in periphrastic perfects provides evidence for the hierarchy in (63) (§4.1.2):

- (63)  $[[\text{PerfectP} \ \dots \ [\text{VoiceP} \ \dots \ [\text{VP} \ \dots \ [\text{ResultP} \ \dots \ ]]]]]]$



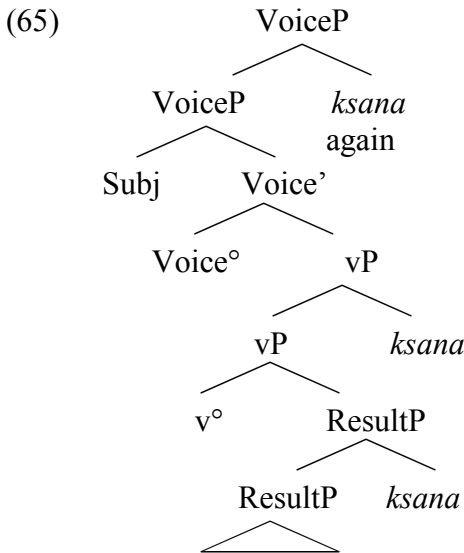
#### 4.1.1. Non-incorporated 'ksana'

Unincorporated *ksana* can occupy four different positions in the clause.

Distribution in SVO orders: In SVO orders, *ksana* can occupy four positions.

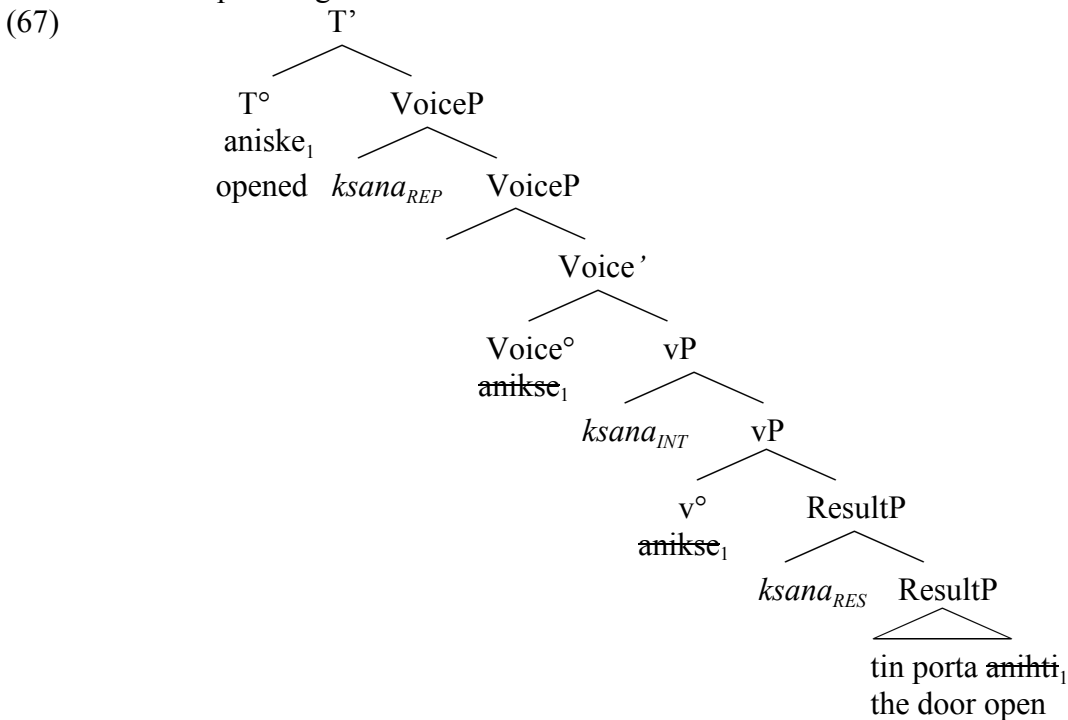
I. Sentence final position (ignoring subjectless readings which are a special case of REP readings):

- (64) O Janis anikse tin porta **ksana**. *REP/INT/RES*  
John opened the door again.



II. *ksana* located between the verb and the object:

- (66) O Janis anikse **ksana** tin porta. *REP/INT/RES*  
John opened again the door.

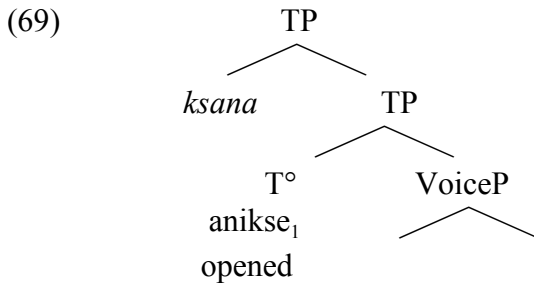


*Analysis of (67):* Greek has V°-to-T° (Rivero 1994; Philippaki-Warburton 1989, 1998; Tsimpli 1990; Drachman 1991; Alexiadou 1997; Alexiadou & Anagnostopoulou 1998, i.a.). The fact that RES is possible when *ksana* precedes the direct object suggests that in Greek (unlike in German) the direct object does not vacate the vP.

III. Order *ksana* - verb:

- (68) O Janis **ksana** anikse tin porta. *REP/\*INT/\*RES*  
 John again opened the door.

The verb moves to T°. Hence, word order suggests that *ksana* left-adjoins to TP, from where it scopes over the base position of the subject, resulting in REP.



IV. High attachment in sentence initial position, which again supports repetitive reading only:

- (70) **Ksana** o Janis anikse tin porta. *REP/\*INT/\*RES*  
 Again John opened the door.

Further matches between word order and interpretation: In addition to the SVO order, Greek admits VSO and VOS orders. The structural analysis generates concrete predictions, two of which are:

*Prediction 1 (confirmed):* if *ksana* intervenes between the V and the S in VSO, it only admits REP.

- (71) Anikse **ksana** o Janis tin porta. *REP/\*INT/\*RES*  
 opened again John the door

*Prediction 2 (confirmed):* If *ksana* follows the subject in VSO orders, INT and RES are available.

- (72) Anikse o Janis **ksana** tin porta. *REP/INT/RES*  
 opened John again the door

*Corollary:* The fact that (72) admits REP provides evidence that the subject in VSO orders is *not* necessarily VP-internal (cf. Chatzikyriadiades, Michelioudakis & Spathas 2014 for a similar conclusion based on *mono* /‘only’).

*Puzzle:* In one environment, *ksana* behaves like German *wieder* in that it can be interpreted REP and RES, but not INT.

- (73) Anikse tin porta **ksana** o Janis. *REP/\*INT/RES*  
 opened the door again John.

4.1.2. Incorporated ‘*ksana*’

*Ksana* can incorporate into V° (Rivero 1992, Alexiadou 1997):

- (74) a. ksanadiavase again-read-3sg d. ksanakolibise again-swam-3sg  
 b. ksanashediase again-designed-3sg e. ksanaihe again-had-3sg  
 c. ksananikse again-opened-3sg

Incorporated *ksana* is three-ways ambiguous between RES, INT and REP. The RES reading is particularly salient with ditransitive verbs where the preferred interpretation for incorporated *ksana*- is RES (only RES is spelled out in (75)):

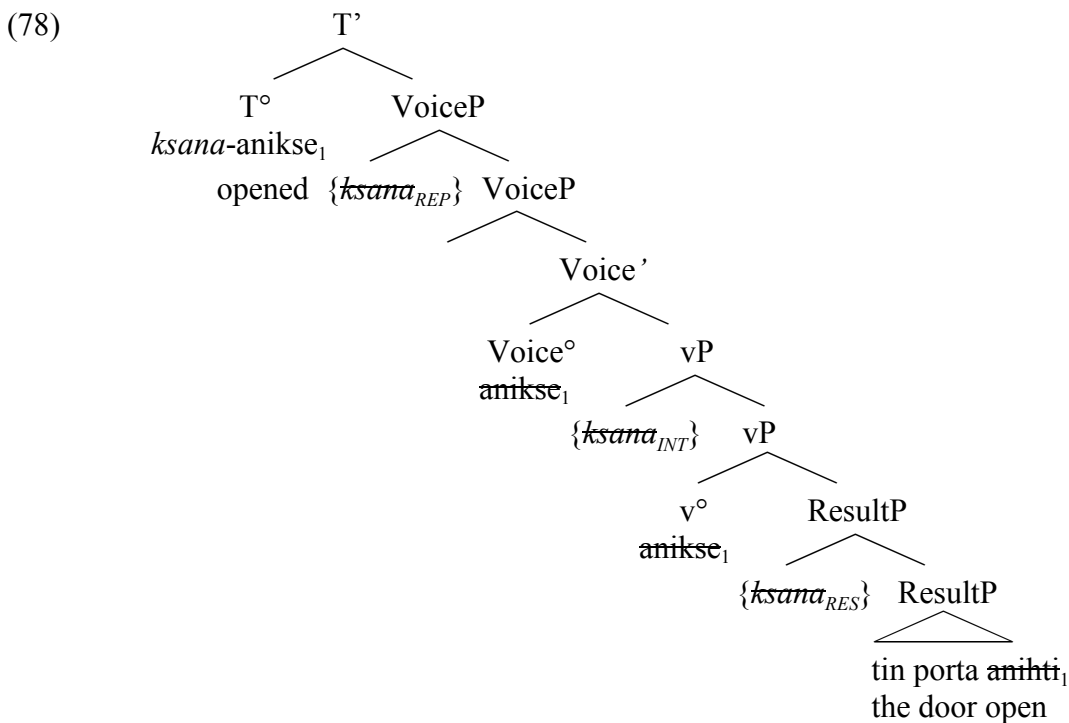
- (75) O Janis ksanadose to vivlio stin Maria. *REP/INT/RES*  
 The Janis again-gave the book to Mary  
 ‘Janis gave back the book to Mary’  
 [Mary had the book before and Janis gave it back to her]

Recall that when non-incorporated *ksana* precedes the verb, it can only have the repetitive reading:

- (76) O Janis ksana edose to vivlio stin Maria. *REP/\*INT/\*RES*  
 The Janis again gave the book to Mary  
 ‘Janis again gave the book to Mary’

*Analysis:* ambiguity in (75) is the product of incorporation and reconstruction.

- (77) a. The verb moves up to T°.  
 b. *ksana* incorporates from its RES position to v°, INT to Voice° or REP to T°.  
 c. The verb freely reconstructs, together with incorporated *ksana*, into lower positions.

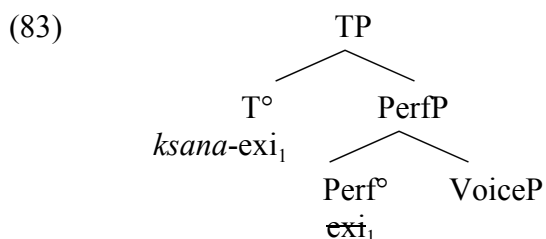


*ksana* and auxiliaries: in periphrastic tenses, *ksana* can incorporate either into the auxiliary or the main verb.<sup>4</sup> Incorporation into the participle preserves all readings, while incorporation into the auxiliary only admits REP:

- (79) a. O Janis ehi ksananiksi tin porta. *REP/INT/RES*  
 John has again-opened the door  
 b. O Janis ksanaehi aniksi tin porta. *REP/\*INT/\*RES*  
 John again-has opened the door
- (80) O Janis exi ksanadosi to vivlio stin Maria *REP/INT/RES*  
 Janis has again-give the book to-the Mary  
 ‘John has given the book back to Mary’
- (81) O Janis ksanaexi dosi to vivlio stin Maria *REP/\*INT/\*RES*  
 The Janis again-has given the book to-the Mary  
 ‘Not good in the interpretation: John has given the book back to Mary’

*Analysis of the auxiliary - participle asymmetry:*

- (82) a. Perfect auxiliaries are generated in Perf<sup>o</sup> above VoiceP, and can only reconstruct to Perf<sup>o</sup>. Thus, INT and RES are blocked.
- b. The participle is generated lower (the product of Result<sup>o</sup>-to-v<sup>o</sup>-to-Voice<sup>o</sup> movement) and reconstructs to all three positions. Hence all three readings are allowed.



- (84) *Interim summary*
  - a. Incorporated *ksana* is similar to non-incorporated *ksana*.
  - b. The differences between incorporated and non-incorporated *ksana* can be explained by syntactic head movement and reconstruction.

#### 4.2. INCORPORATED *KSANA*- VS. ENGLISH *RE*-

Incorporated *ksana*- is not the counterpart of English *re*-, but an incorporated adverbial. Evidence comes from differences between incorporated *ksana* and *re*- w.r.t. selection restrictions and scope.

Selection restrictions: Unlike *re*-, incorporated *ksana* does not require presence of object, and can co-occur with unaffected objects, achievements, double object verbs and locative arguments.

- (85) a. \*?John resmiled/resmoked/relaughed/resung.
- b. O Janis ksanahamogelase/ksanakapnise/ksanagelase/ksanatragudise.
- (86) a. ??John rereached the top.
- b. O Janis ksanagikse tin korifi.
- (87) a. ??I rekicked the wall.
- b. Ksanaklotsisa-1sg ton tiho.
- (88) a. \*I reput the folder on the table.
- b. Ksanavala1-sg to dosie sto trapezi.
- (89) a. \*I rehanded John the t-shirt for his birthday.
- b. Ksanadosa-1sg tu Jani to bluzaki ja ta genethlia tu.

Scope: *re*- cannot scope over aspectual adverbs, while *ksana* can:

- (90) a. John repolluted the river completely. *completely* > *re*-/\**re* > *completely*
- b. O Janis ksanamoline to potami oloklirotika. *completely* > *ksana/ksana* > *completely*

#### 4.3. GREEK *ANA*- CORRESPONDS TO ENGLISH *RE*-

The Greek prefix *ana*/‘again’, which comes from Ancient Greek, displays all characteristic properties of English *re*-. *ana*- is not fully productive and only attaches to stems of Ancient Greek origin.

Selection restrictions: *Ana*- is very common with verbs of creation, building and structuring. Strikingly, many Greek verbs formed with *ana*- have English translation equivalents formed with *re*-:

- (91) a. ana-kiklono re-cycle
- b. ana-dimiurgo re-create
- c. ana-diamorphono re-form
- d. ana-diatasso re-structure
- e. ana-viono re-live
- f. ana-dimosievo re-publish
- g. ana-diarthrono re-structure
- h. ana-diatipono re-formulate

Scope: Indefinite objects systematically scope above *ana* (entailments have been tested):

- (92) a. O Janis ana-vathmologise ena grapto.  $\exists > ana-/*ana- > \exists$   
 The Janis re-marked a term paper  
 ‘Janis re-evaluated a term paper’  
 b. O Janis ksana-vathmologise ena grapto.  $ksana- > \exists/\exists > ksana$  (on REP)  
 The Janis again-marked a term paper

In contrast to *ksana*, *ana-* cannot be assigned scope over adverbs:

- (93) a. O Gianis ana-vathmologise to grapto prosektika.  $carefully > ana-/*ana- > carefully$   
 The Gianis re-marked the paper carefully  
 b. O Janis ksanavathmologise to grapto prosektika.  $carefully > ksana-/ksana- > carefully$
- (94) *Conclusion*: scope and selection restrictions provide evidence that Greek *ana-* is the counterpart of *re-* and is amenable to the same analysis: a little  $v^\circ$  head with the semantics in (58) and the syntax in (59).

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## 5. TYPOLOGY OF REPETITIVE MORPHEMES II: ITALIAN AND FRENCH

Italian *ri-* and French (stressed) *re-* display REP/RES ambiguity (implicit in Cardinaletti 2003: 14-15; Sportiche 2012; fn. 8). Hence, Italian/French *ri-/re-* differ from English *re-* and Greek *ana-* (which only admit RES).

Selection restrictions: *ri-/re-* can modify any verb, irrespective of aspectual class, and is not subject to the sole complement generalization. Hence, *ri-/re-* patterns along with *ksana-*.

- (95) a. Ha ributtato via il latte.  
 he has re-thrown away the milk  
 b. Questo mi ristupisce ogni volta.  
 this me amazes every time.

Incorporation: Just like Greek *ksana* and German *wieder*, French *re-* need not incorporate/prefix.

- (96) a. Jean a lentement re mangé.  
 John has slowly re-eaten  
 b. Jean a re lentement mangé.  
 John has RE slowly eaten

By contrast Italian *ri-* is a verbal affix (Cardinaletti 2002; Sportiche 2012: 3).

### 5.1. MOVEMENT TYPES: INCORPORATION VS. CLITICIZATION

Italian: For Italian, Cardinaletti (2002) argues that *ri-* is attached to its host via incorporation and not cliticization. Arguments:

○ *ri-* is always the outmost prefix:

- (97) a. ri-dis-fare  
 RE-un-do  
 b. \*dis-ri-fare

○ *ri-* closer to the finite verb than clitic pronouns (like Greek *ksana-* in (100) below):

- (98) a. Lo rifa / \*Ri lo fa.  
           it re-does  
           'He does it again'  
       b. Lo ripu? fare/ \*Ri lo pu? fare.  
           it re-can do  
           'He can do it again'

○ In infinitives and imperatives, *ri-* is proclitic while clitic pronouns are enclitic (cf. *ksana-*; (100)):

- (99) a. Pu? rifarlo  
           canre-do-it  
           'He can do it again'  
       b. Rifallo!  
           re-do-it!  
           'Do it again!'

Greek: it is clear that *ksana-* is attached to its host via incorporation rather than cliticization.

○ *ksana-* is closer to the finite verb than clitic pronouns (100)a.

○ In imperatives, *ksana-* precedes the verb, unlike pronouns, that must be enclitic (100)b.

- (100) a. Tu to ksana-edose.  
           him it again- gave-3sg  
           'He/she gave it to him again'  
       b. Ksanadose tu to.  
           again-give him it  
           'Give it to him again!'

In this respect, *ksana* behaves like other incorporating adverbs (Rivero 1992):

- (97) a. Tu to sigo-psithirise.  
           him it quietly-whispered  
           'He/she whispered it to him quietly'  
       b. Sigo-psithirise tu to!  
           quietly-whisper him it  
           'Whisper it to him quietly!'

## 5.2. PERFECT AUXILIARIES: GREEK VS. ITALIAN/FRENCH

Greek *ksana* can incorporate into the perfect auxiliary *exo*'have'. It can also incorporate into *ine*'be', and appear unincorporated before *exo* or *ine*:

- (101) I Maria ksana-ine arrosti.  
           The Mary again-is sick  
       (102) a. I Maria ksana exi aniksi tin porta.  
                   The Maria again has opened the door  
           b. I Maria ksana ine arrosti.  
                   The Maria again is sick

By contrast, French *re-* must not precede tensed auxiliaries *avoir* and *etre*. (*re-* is attested to the left of participial forms of the auxiliaries):

- (103) a. ??Jean re a soif.  
 Jean RE has thirst  
 b. ??Marie re avait faim.  
 Marie RE had hunger  
 c. ??Marie re est malade.  
 Marie RE is sick  
 d. ?? Marie re était fatigüe.  
 Marie RE was tired
- (104) a. Jean a re été vu.  
 Jean has RE been seen  
 b. Marie aurait re eu raison.  
 Marie would RE have reason (would have been right again)

*Sportiche's analysis of French:* (i) tensed auxiliaries raise higher than main tensed verbs and (ii) *re-* cannot precede the landing site of tensed auxiliary.

*Corollary for Greek:* tensed auxiliaries in Greek do *not* raise as high as their counterparts in French. Hence, *ksana-* can surface to the left of *exo* and *ine*.

*Analysis of Greek:* In French, auxiliaries target the low C°- domain. In Greek, this position is occupied by particles (*na* for subjunctive, *tha* for future; Alexiadou 1997, Roussou 2000). Thus, Greek auxiliaries stop in a position below *ksana*.

(105) *Typological consequence*

The position of *re-/ksana* relative to auxiliaries provides diagnostic for cross-linguistic variation in the scope of auxiliary movement (confirming and extending Sportiche 2012).

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## 6. CONCLUSIONS

- Cross-linguistically, repetitive morphemes can be expressed by three different strategies:

- (106) a. Heads: English *re-*, Greek *ana*  
 b. Adverbs: *again*, *wieder*, unincorporated Greek *ksana* and French *re-*  
 c. Incorporated/ing adverbs: *wieder*, Greek *ksana*, French *re-*, Italian *ri-*

- Adverbs ((106)a and (106)b) form a homogeneous group to the exclusion of heads:

- (107) a. *Selection restriction*  
 i. Heads only combine with accomplishments and single object DPs.  
 ii. Adverbs do not impose selection restrictions.  
 b. *Scope*  
 i. Heads scope below indefinites and admit (narrow) RES readings only.  
 ii. Adverbs take surface scope (REP, INT or RES), in case of incorporation parasitic on verb movement. Adverbs optionally scope above indefinite objects.

- The verbal domain consists of two layers: vP and VoiceP. Crucially, the evidence used for diagnosing internal complexity hinges on identifying criteria for the third reading (INT).

- Results from typological investigations of semantic phenomena are sometimes masked by uninformative entailments patterns.

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*Endnotes*

1. We are indebted to Giorgos Spathas for discussion of and help with this issue.
2. Interestingly, negation also does not seem to be ignored with the universal perfect:
  - (i) John hasn't cried again since his accident in 1959.  
\**Presupp*: John has been crying since his accident in 1959.  
*Presupp*: It is not the case that John has been crying since his accident in 1959.
 This might be related to Iatridou's mysterious *echi na* construction, which includes a silent, yet semantically detectable negation. (i) and (ii) receive a parallel treatment if both include silent negation in the presupposition, and object language negation is - just as in the other cases - ignored in (i).
  - (ii) Echo na do ton Ganni apo 2005.  
Have *na* see the Janis since 2005.  
'I have *not* seen Janis since 2005.'
3. French lexical causatives display similar characteristics. Intermediate readings are possible with the verbal prefix *re-*, but not with adverbial *de nouveau*/'again' (p.c., Fabienne Martin).
4. If *ksana* incorporates into the perfect participle, it also has an interesting reading first observed by Mark Michalski and Giorgos Spathas: it denotes temporal anteriority and forces the experiential reading of the Perfect:
  - (i) a. O Giannis exi ksanapai stin Thai landi  
Janis has again-gone to Thailand  
'Janis has gone/been to Thailand before'
  - b. O Gianis ksanaexi pai stin Thai landi  
Janis againhas gone to Thailand  
'Janis has gone/been to Thailand before'

Neither *again* nor *wieder* have this reading. In this paper we do not discuss this reading at all. We are investigating this issue in work in progress with G. Spathas.





