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Abstract

The primary aim of this paper is a description of a previously unanalyzed kind of numeral quantifiers in Japanese. While the purpose is modest, I believe that it might shed light on the Neo-Davidsonian semantic architecture (see Parsons 1990, Schein 1993 and Kratzer 1996 among others). Specifically, I will introduce Event Partitioning Quantifiers (EPQs), which have not been analyzed in literature and show that with an EPQ, agents of events and themes of events are quantified independently of both an event expressed by a lexical verb and host nominals in the subject or in the object. Based on this observation, I discuss the semantic independence of thematic roles Agent and Theme from their corresponding verb.

The Semantic Ontology of Agent and Theme:

A Case Study with Event Partitioning Quantifiers in Japanese

Takanobu Nakamura*

1 Introduction

The primary aim of this paper is a description of a previously unanalyzed kind of numeral quantifiers in Japanese. While the purpose is modest, I believe that it might shed light on the Neo-Davidsonian semantic architecture (see Schein 1993 and Kratzer 1996 among others). First of all, I refer to the unit of a numeral e.g., *san* (three), and a classifier e.g., *nin* (a classifier for human-beings), as a “numeral quantifier (NQ)” and refer to a nominal predicate that is quantified over by a NQ e.g., *gakusei* (student), as a “host nominal”. It has been observed that a NQ can appear in at least three positions in a sentence. I refer to the NQ in (1a) as “prenominal NQ”, the NQ in (1b) as “postnominal NQ” and the NQ in (1c) as “floated NQ (FNQ)”. These three kinds of NQs are underlined and their (potential) host nominals are boldfaced throughout this paper. To express the relation between an NQ and its host nominal, I mark them by the same numerical subscript.

- (1) a. San-nin₁-no **gakusei**₁-ga ki-ta. (prenominal NQ)
3-human_{CL}¹-GEN student-NOM come-PST
b. **Gakusei**₁-san-nin₁-ga ki-ta. (postnominal NQ)
Student-3-human_{CL}-NOM come-PST
c. **Gakusei**₁-ga san-nin₁ ki-ta. (FNQ)
Student-NOM 3-human_{CL} come-PST
‘Three students came.’

As for prenominal and postnominal NQs, researchers agree that they form a constituent with its host nominal. However, it is controversial whether an FNQ forms a constituent with its host nominal or not. I will call an advocate of the view in which FNQs and its host nominal form a constituent as a “stranding analysis”. In stranding analyses, FNQs are base-generated with its host nominal forming a constituent and then, the host nominal moves to a higher position, stranding the NQ. On the contrary, I will call an advocate of the view in which FNQs and its host nominal do not form a constituent as an “adverb analysis”. In adverb analyses, FNQs are base-generated out a nominal projection headed by the host nominal as an adverb adjoined to a verbal projection. Note that the term “host nominal” is used in the theory neutral sense. That is to say, it does not imply that FNQs are not adverbial.

In this paper, I discuss the semantic independence of thematic roles *Agent* and *Theme* from their corresponding verb. Specifically, I will show the cases in which agents of events and themes of events are quantified independently of both an event expressed by a lexical verb and host nominals in the subject or in the object. To illustrate this, I will introduce *Event Partitioning Quantifiers (EPQs)*,² which have not been analyzed in literature. I will define a complex NQ consisting of an NQ *hito-ri* (1-human_{CL}) followed by an arbitrary NQ as an EPQ. In this sense, there are two host nominals per EPQ because an EPQ contains two NQs. EPQs are exemplified below. To distinguish EPQs and other kinds of NQs, I will mark an EPQ by wavy line.

- (2) a. **Kodomo**₁-ga **okasi**₂-o hito-ri₁ hito-tu₂ ka-ta.
child-NOM candy-ACC 1-human_{CL}-1-thing_{CL} buy-PST
‘Every child bought at least one candy.’

* I would like to thank Takaomi Kato, Naoki Fukui, Toru Ishii and Chris Tancredi for their valuable comments. I am also grateful to the audience at the PLC 40. All remaining errors and inadequacies are my own

¹ CL in gloss stands for a classifier e.g., “human_{CL}” stands for a classifier used for human-beings in general.

² I thank Takaomi Kato (p.c.) for suggesting a suitable name for this kind of NQs.

- b. **Gakusei**₁-ga hito-ri₁ ik-kai hasi-ta.
student-NOM 1-human_{CL}-1-event_{CL}³ run-PST
 ‘Every student ran at least once.’

From the next section, I will illustrate the peculiarities of EPQs and argue that EPQs are adverbial. Then, I will argue that EPQs provide a case in which the thematic predicate Agent (e, x) and Theme (e, y) exhibit their independence from host nominals and verbal predicates, which provides a piece of evidence for the Neo-Davidsonian decomposition based on non-English data.

2 The Event Partitioning Quantifier and its properties

In this section, I will illustrate the peculiarities of EPQs. First of all, I will list them below.

(3) The properties of Event Partitioning Quantifiers:

- a. *Co-occurrence:*
 An EPQ can co-occur with another prenominal NQ, postnominal NQ or FNQ which share the same host nominal with the EPQ, though prenominal NQs, postnominal NQs and FNQs cannot redundantly occur with one host nominal.
- b. *Distributivity and Uniformity:*
 An EPQ requires that every corresponding individual in the discourse is exhaustively involved in the events expressed by a sentence, and every event expressed by the sentence is uniform in terms of its number of agents and themes.
- c. *Scope Closing Effect:*
 When an EPQ is involved, the NQs of the object become scopeless.
- d. *Subject/Object Asymmetry:*
 When an EPQ co-occur with another NQ, the object cannot induce a distributive reading, whereas the subject must induce a distributive reading. This is invariant with respect to scrambling.

From now on, I will illustrate (3a-d) one by one.

2.1 Co-occurrence and Adverbial-hood of an EPQ

First, I will observe that the property (3a) holds. EPQs are compatible with other instances of NQs, even though they share the same host nominals.⁴

- (4) An EPQ associated with the subject of an intransitive verb
- a. San-nin₁-no **gakusei**₁-ga hito-ri₁ ik-kai hashi-ta. (Pre-EPQ)
3-human_{CL}-GEN **student**-NOM 1-human_{CL}-1-event_{CL} run-PST
- b. **Gakusei**₁-san-nin₁-ga hito-ri₁ ik-kai hashi-ta. (Post-EPQ)
student-3-human_{CL}-NOM 1-human_{CL}-1-event_{CL} run-PST
- c. **Gakusei**₁-ga san-nin₁ hito-ri₁ ik-kai hashi-ta. (FNQ-EPQ)
student-NOM 3-human_{CL} 1-human_{CL}-1-event_{CL} run-PST
 ‘Each of the three students ran at least once.’

³ Note that *-kai* (event_{CL}) is a classifier that counts events and does not need a host nominal.

(i) Taro-ga Jiro-o san-kai tatai-ta.
 Taro-Nom Jiro-ACC 3-event_{CL} hit-PST
 ‘Taro hit Jiro three times.’

Though EPQs with *-kai* and those without it might differ, that does not affect the discussion in this paper. I mainly use EPQs with *-kai* when only one host nominal is found in a sentence; namely, when an intransitive verb or a transitive verb whose one of the arguments is occupied with a proper name is used.

⁴ I will use “Pre” as an abbreviation of prenominal NQs and “Post” as an abbreviation of postnominal NQs.

- (5) An EPQ associated with the object of a transitive verb
- Niimisan-ga san-nin₁-no **sensyu₁**-o hito-ri₁ ik-kai osie-ta. (Pre-EPQ)
Niimi-sir-NOM 3-human_{CL}-GEN **player**-ACC 1-human_{CL}-1-event_{CL} teach-PST
 - Niimisan-ga **sensyu₁**-san-nin₁-o hito-ri₁ ik-kai osie-ta. (Post-EPQ)
Niimi-sir-NOM **player**-3-human_{CL}-ACC 1-human_{CL}-1-event_{CL} teach-PST
 - Niimisan-ga **sensyu₁**-o san-nin₁ hito-ri₁ ik-kai osie-ta. (FNQ-EPQ)
Niimi-sir-NOM **player**-ACC 3-human_{CL} 1-human_{CL}-1-event_{CL} teach-PST
'Mr. Niimi taught each of the three players at least once.'

This property is typical to EPQs. As the ill-formedness of examples in (6a-e) illustrate, multiple occurrence of NQs other than EPQs is normally impossible.⁵

- (6) a. *San-nin₁-no hito-ri₁-no **gakusei₁**-ga hashi-ta. (*Pre-Pre)
3-human_{CL}-GEN 1-human_{CL}-GEN **student**-NOM run-PST
- b. *San-nin₁-no **gakusei₁**-hito-ri₁-ga hashi-ta. (*Pre-Post)
3-human_{CL}-GEN **student**-1-human_{CL}-NOM run-PST
- c. *San-nin₁-no **gakusei₁**-ga hito-ri₁ hashi-ta. (*Pre-FNQ)
3-human_{CL}-GEN **student**-NOM 1-human_{CL} run-PST
- d. ***Gakusei₁**-san-nin₁-ga hito-ri₁ hashi-ta. (*Post-FNQ)
student-3-human_{CL}-NOM 1-human_{CL} run-PST
- e. ***Gakusei₁**-ga san-nin₁ hito-ri₁ hashi-ta. (*FNQ-FNQ)
student-NOM 3-human_{CL} 1-human_{CL} run-PST
'Three students ran.'

As the proper name *Niimi* is used for the subject in (5a-c), a reading in which the EPQ *hito-ri ik-kai* (1-human_{CL}-1-event_{CL}) is associated with the subject is blocked. However, when the proper name *Niimi* is replaced by the nominal *koochi* (coach), the sentence become ambiguous.

- (7) An EPQ associated either with the subject or the object of the transitive verb
- Koochi₁**-ga san-nin₂-no **sensyu₂**- hito-ri_{1/2} ik-kai osie-ta. (Pre-EPQ)
coach-NOM 3-human_{CL}-GEN **player**-ACC 1-human_{CL}-1-event_{CL} teach-PST
 - Koochi₁**-ga **sensyu₂**-san-nin₂-o hito-ri_{1/2} ik-kai osie-ta. (Post-EPQ)
coach-NOM **player**-3-human_{CL}-ACC 1-human_{CL}-1-event_{CL} teach-PST
 - Koochi₁**-ga **sensyu₂**-o san-nin₂ hito-ri_{1/2} ik-kai osie-ta. (FNQ-EPQ)
coach-NOM **player**-ACC 3-human_{CL} 1-human_{CL}-1-event_{CL} teach-PST
 - The EPQ is associated with the nominal *koochi* in the subject
'Every coach taught one of the three players at least once.'
 - The EPQ is associated with the nominal **sensyu** in the object
'Coaches taught each of three players at least once.'

It means that the relation between an EPQ and its host nominal is insensitive to locality constraint. As has been traditionally observed (Haig 1980, Kuroda 1980), when a sentential subject is a host nominal of an FNQ, the subject and its FNQ have to be adjacent as in (8c). This locality constraint

⁵ Inoue (1978) shows the cases in which an FNQ and a prenominal NQ can co-occur with one host nominal when the host nominal is a definite expression.

- (i) Naran-de hashit-tei-ta suu-dai₁-no **torakku₁**-ga gaadoreeru-ni san_yon-dai₁ butukat-ta.
side-by-side run-PROG-PST some-car_{CL}-GEN **track**-NOM guardrail-at 3, 4-car_{CL} bump-PST
'Three or four of some tracks that ran side by side bumped the guardrail.' (Inoue 1978: 175(36))

This observation is not a counterexample for my observation, but rather indicates a generalization that multiple occurrence of NQs with a host nominal is possible only when one of the NQs is adverbial. Actually, she shows this observation to argue that there is an FNQ which is base-generated as an adverb. Though I do not go into the detail, her observation is in accord with the approach that this paper suggests.

is used as one of the pieces of evidence for the stranding analysis of FNQ⁶ (e.g., Miyagawa 1989). However, EPQs do not have to satisfy this requirement as in (8d-e).

- (8) a. Hito-ri₁-no **gakusei**₁-ga usagi-o tukamae-ta.
1-human_{CL}-GEN **student**-NOM rabbit-ACC catch-PST
 b. **Gakusei**₁-ga hito-ri₁ usagi-o tukamae-ta.
student-NOM 1-human_{CL} rabbit-ACC catch-PST
 c. ***Gakusei**₁-ga usagi-o hito-ri₁ tukamae-ta.
student-NOM rabbit-ACC 1-human_{CL} catch-PST
 ‘A student caught a rabbit.’
 d. **Gakusei**₁-ga usagi-o hito-ri₁ ik-kai tukamae-ta.
student-NOM rabbit-ACC 1-human_{CL}-1-event_{CL} catch-PST
 ‘Students caught rabbits once per a student.’
 e. **Gakusei**₁-ga **usagi**₂-o hito-ri₁ ip-piki₂ tukamae-ta.
student-NOM **rabbit**-ACC 1-human_{CL}-1-animal_{CL} catch-PST
 ‘Students caught one rabbit per a student.’

Though some of FNQs can keep its well-formedness in the violation of the locality constraint, EPQs can survive the locality violation uniformly. Thus, EPQs are adverbial in nature and distinguished from prenominal NQs, postnominal NQs and possibly, FNQs.

2.2 Distributivity and Uniformity

Second, I will observe the property (3b). An EPQ requires that every individual expressed by its host nominal participates one of the expressed events (Distributivity) and that every expressed event is uniform in terms of the number of its participants (Uniformity).

- (9) a. **Gakusei**-ga hasi-ta. (no EPQ is involved)
student-NOM run-PST
 b. **Gakusei**₁-ga hito-ri₁ ik-kai hasi-ta. (with an EPQ)
student-NOM 1-human_{CL}-1-event_{CL} run-PST
 c. **Ryoosi**-ga sika-o ka-ta. (no EPQ)
hunter-NOM deer-ACC hunt-PST
 d. **Ryoosi**₁-ga **sika**₂-o hito-ri₁ it-too₂ ka-ta. (with an EPQ)
hunter-NOM **deer**-ACC 1-human_{CL}-1-animal_{CL} hunt-PST

(9a) allows a reading in which there is a student who does not run. Also, (9c) allows a reading in which there is a hunter who does not hunt any deer. However, (9b) requires a reading in which every individual student in the discourse participates an event of running and (9d) requires a reading in which every individual hunter in the discourse participates an event of hunting. Note that *gakusei* (student) in (9b) and *ryoosi* (hunter) in (9d) must be interpreted as a bare plural. More importantly, (9d) requires that every individual hunter hunted at least one deer. In other words, an EPQ partitions a plural event into uniform singular events. To see the uniformity requirement of an EPQ, I will introduce EPQs whose second NQs contain numbers larger than one. The combination of numerals in an EPQ is not necessarily one-to-one, but one-to-many is also allowed. However, the inverse, many-to-one and many-to-many is not allowed.⁷

- (10) «one-to-many»
 a. **Syain**₁-ga **arubaito**₂-o hito-ri₁ san-nin₂ sidoosi-ta.
staff-NOM **part-timer**-ACC 1-human_{CL}-3human_{CL} instruct-PST
 ‘Every staff taught at least three part-timers.’

⁶ In fact, a number of counterexamples for the locality constraint on FNQs are reported in literature. See Fukushima (1991), Kikuchi (1994), Mihara (1998), Ishii (1999) and references therein.

⁷ A few informants report that (10c-e) are acceptable, though their interpretation varies. I assume that many-to-one or many-to-many type EPQs are ill-formed in principle.

- « many-to-one »
- b. ***Ryoosi**₁-ga **sika**₂-o san-nin₁ it-to₂ ka-ta.
hunter-NOM deer-ACC 3-human_{CL}-animal_{CL} hunt-PST
 ‘Every group of three hunters hunted at least one deer.’
- c. ***Ryoosi-roku-nin**₁-ga ni-too₂-no **sika**₂-o san-nin₁ ip-piki₂ ka-ta.
hunter-6-human_{CL}-NOM 2-animal_{CL}-GEN deer-ACC 3-human_{CL}-1-animal_{CL} hunt-PST
 ‘Every group of three hunters in the six hunters hunted at least one of the two deer.’
- « many-to-many »
- d. ***Ryoosi**₁-ga **sika**₂-o huta-ri₁ san-biki₂ ka-ta.
hunter-NOM deer-ACC 2-human_{CL}-3-animal_{CL} hunt-PST
 ‘Every group of two hunters hunted at least three deer.’
- e. ***Ryoosi-yo-nin**₁-ga ro-piki₂-no **sika**₂-o huta-ri₁ san-biki₂ ka-ta.
hunter-4-human_{CL}-NOM 6-human_{CL}-GEN deer-ACC 2-human_{CL}-3-animal_{CL} hunt-PST
 ‘Every group of two hunters in the four hunters hunted at least three of the six deer.’

Then, compare (10a) and its counterpart without an EPQ. In case of (10a), if there is x number of staffs and y number of part-timers, an EPQ impose interpretations in which each of x full-timers participates an event of teaching whose theme is at least three of the y part-timers. Uniformity plays a crucial role here. Suppose that there are three staffs and nine part-timers. Then, consider that a, b, c stands for each individual staffs and 1, 2, ..., 9 stands for each individual part-timers. Right-arrows indicate that there is a singular event in which the corresponding left side element and right side element are involved. Then, consider the following situations (11a), where every individual staff is involved in events of teaching whose themes are three distinct part-timers, respectively. The situation (11a) is uniform in the sense that each individual staff corresponds to three part-timers. Under this uniform situation (11a), both (11b-c) is true.

- (11) a. a → 1
 → 2
 → 3
 b → 4
 → 5
 → 6
 c → 7
 → 8
 → 9
- b. True: Syain-ga arubaito-o sidoosi-ta.
staff-NOM part-timer-ACC instruct-PST
 ‘Staffs taught three part-timers.’
- c. True: **Syain**₁-ga **arubaito**₂-o hito-ri₁ san-nin₂ sidoosi-ta. (= 10a)

On the other hand, consider a non-uniform situation. In (12a) a instructs 1~4, b instructs 5~6 and c instructs 7~9. Under this situation, (12c) is false, whereas (12b) is true.

- (12) a. a → 1
 → 2
 → 3
 → 4
 b → 5
 → 6
 c → 7
 → 8
 → 9
- b. True: Syain-ga arubaito-o sidoosi-ta.
 c. False: **Syain**₁-ga **arubaito**₂-o hito-ri₁ san-nin₂ sidoosi-ta. (= 10a)

Note that the falsity of (10a) under the situation (12a) is attributed to the fact that b taught only two

part-timers. Even if some full-timer taught more than three part-timers, (10a) is still true under that situation. Thus, an EPQ require the interpretation of events such that every relevant individual participates an event (distributivity) and the number of themes is required to be equal to or more than the number specified by the second NQ in the EPQ (uniformity).

2.3 The Scope Closing Effect and Subject/Object Asymmetry

Third, I will see the property (3c). When an EPQ and other NQs co-occur with one host nominal, the NQ of the object must be scopeless. In other words, sentences with an EPQ allows only a cumulative reading. That is to say, no other NQ enters into the domain of the NQ of the object and it never enter into the domain of any other NQs. The NQs of the object are somehow *closed* within scopeless position and they just express the range of individuals from which themes of events are chosen. I call it the “Scope Closing Effect”. It has been observed that Japanese is rigid scope language (Kuroda 1969/70 among others), in which no inverse scope is obtained unless the object is dislocated by scrambling. However, this is not the case with sentences with an EPQ. Even when the object is scrambled, still the NQ of the object must be scopeless and the subject must induce a distributive reading. I call this as “subject/object asymmetry”. To observe these properties, I will first examine the possible scope taking patters of NQs in a sentence without an EPQ. Then, by comparing that with a sentence with an EPQ, I will illustrate the Scope Closing Effect and the subject/object asymmetry. I use a sentence with a transitive verb and two prenominal NQs. Note that NQs are easier to induce scope ambiguities than other quantifiers and thus it is easier to observe the relevant properties.

- (13) San-nin₁-no gakusei₁-ga ni-satu₂-no hon₂-o kat-ta.
 3-human_{CL}-GEN student-NOM 2-book_{CL}-GEN book-ACC buy-PST
 ‘Three students bought two books.’

Then, suppose that 1, 2, 3, ... stands for students and a, b, c, ... stands for books. Then, (13) has at least four-way ambiguities as shown below. Note that a numeral quantifier is expressed in a notation “numeral-distributive⁸/non distributive,” “ $a > b$ ” means “ a takes scope over b ” and “ $a = b$ ” means “ b is scopeless.” The right-arrow expresses a single event of buying.

- (14) « Possible scopal relations »
- a. 3-distributive > 2-distributive:
 - 1 → a
 - b
 - 2 → c
 - d
 - 3 → e
 - f
 - b. 3-non distributive > 2-distributive:
 - 1, 2, 3 → a
 - 1, 2, 3 → b
 - c. 3-distributive > 2-non distributive:
 - 1 → a, b
 - 2 → c, d
 - 3 → e, f
 - d. 3-non distributive = 2-non distributive (a double collective reading):
 - 1, 2, 3 → a, b
 - e. 3-non-distributive = 2-non-distributive (a cumulative reading):
 - 1, 2, 3 → a, b

⁸ Following Kitagawa and Kuroda (1992), I define a distributive reading as a reading that “necessarily implies the occurrence of multiple events” and a non-distributive reading as a reading that “implies the occurrence of only a single event” (Kitagawa and Kuroda 1992: 88-89). This consideration of distributivity is in accord with Landman’s (2000) treatment on distributivity.

underspecified

(14e) is a cumulative reading in which the number of events is underspecified and NQs *san-nin* (3-human_{CL}) and *ni-satsu* (2-book_{CL}) express the total number of students and books which are involved in at least one event of buying. When the object is dislocated by scrambling, inverse scope becomes available and it exhibit at least seven-way ambiguities.

- (15) Ni-satu₁-no **hon**₁-o san-nin₂-no **gakusei**₂-ga kat-ta.
2-book_{CL}-GEN book-ACC 3-human_{CL}-GEN student-NOM buy-PST
'Three students bought two books.'

(16) «Possible scopal relations»

a. 3-distributive > 2-distributive:

- 1 → a
 → b
2 → c
 → d
3 → e
 → f

b. 3-non distributive > 2-distributive:

- 1, 2, 3 → a
1, 2, 3 → b

c. 3-distributive > 2-non distributive:

- 1 → a, b
2 → c, d
3 → e, f

d. 2-distributive > 3-distributive (an inverse scope):

- 1 → a
2 → a
3 → a
4 → b
5 → b
6 → b

e. 2-non distributive > 3-distributive (an inverse collective-distributive reading):

- 1 → a, b
2 → a, b
3 → a, b

f. 2-distributive > 3-non distributive (an inverse distributive-collective reading):

- 1, 2, 3 → a
4, 5, 6 → b

g. 3-non distributive = 2-non distributive (a double collective reading):

- 1, 2, 3 → a, b

h. 3-non-distributive = 2-non distributive (a cumulative reading):

- 1, 2, 3 → a, b
underspecified

Taking these facts into account, I will examine the possible scope taking patterns of these NQs in a sentence with an EPQ. Interestingly, EPQs in a sentence radically disambiguate observed scopal ambiguities. Only a cumulative reading is available. More specifically, the subject must induce a distributive reading and the NQ of the object just mark the range of candidates for the theme of the expressed events.

- (17) San-nin₁-no **gakusei**₁-ga ni-satu₂-no **hon**₂-o hito-ri₁ i-satu₂ kat-ta.
3-human_{CL}-GEN student-NOM 2-book_{CL}-GEN book-ACC 1-human_{CL}-1-book_{CL} buy-PST
'Each of three students bought one of the two books.'

(18) «Scopal relations and interpretations»

3-distributive > 2-scopeless:

- 1 → a or b
 2 → a or b
 3 → a or b

With an EPQ, the NQ of the subject induce a distributive reading and the number of themes are specified by the second NQ in the EPQ. The NQ of the object specifies the range of available themes. Even though the object is scrambled, only the same interpretation is allowed.⁹

- (19) Ni-satu₁-no **hon**₁-o san-nin₂-no **gakusei**₂-ga hito-ri₁ i-satu₁ kat-ta.
2-book_{CL}-GEN **book**-ACC 3-human_{CL}-GEN **student**-NOM 1-human_{CL}-1-book_{CL} buy-PST
 ‘Each of three students bought one of the two books.’

(20) «Scopal relations and interpretations»

3-distributive > 2-scopeless:

- 1 → a or b
 2 → a or b
 3 → a or b

The same thing holds for EPQs of one-to-many. Whether each theme is associated with a singular event is underspecified.

- (21) a. San-nin₁-no **gakusei**₁-ga go-satu₂-no **hon**₂-o hito-ri₁ ni-satu₂
3-human_{CL}-GEN **student**-NOM 5-book_{CL}-GEN **book**-ACC 1-human_{CL}-2-book_{CL}
 kat-ta.
 buy-PST
 ‘Each of three students bought two of the five books.’
 b. Go-satu₁-no **hon**₁-o san-nin₂-no **gakusei**₂-ga hito-ri₂ ni-satu₁
5-book_{CL}-GEN **book**-ACC 3-human_{CL}-GEN **student**-NOM 1-human_{CL}-2-book_{CL}
 kat-ta.
 buy-PST
 ‘Each of three students bought two of the five books.’

(22) «Scopal relations and interpretations»

3-distributive > 5-scopeless:

- 1 → two of {a, b, c, d, e}
 2 → two of {a, b, c, d, e}
 3 → two of {a, b, c, d, e}

Thus, when an EPQ appear, the NQ of the object must be scopeless, specifying the range of available themes (scope closing effect.) Even though the object is scrambled, distributivity is not observed in the object (subject/object asymmetry.)

3 Conclusion and consequences

In this section, I will briefly discuss the effect of the observation above to the debate on FNQs in

⁹ An EPQ internal word order is invariant with respect to scrambling.

- (i) a. San-nin-no gakusei-ga ni-satu-no hon-o hito-ri i-satu yon-kai yon-da.
 b. Ni-satu-no hon-o san-nin-no gakusei-ga hito-ri i-satu yon-kai yon-da.
 c. *San-nin-no gakusei-ga ni-satu-no hon-o i-satu hito-ri yon-kai yon-da.
 d. *Ni-satu-no hon-o san-nin-no gakusei-ga i-satu hito-ri yon-kai yon-da.

Japanese and to the theory of pluralities and events. First, it is observed that an EPQ and other kinds of NQs can co-occur with one host nominal and that an EPQ is not sensitive to the locality of an NQ and its host nominal. These observations strongly suggest the adverbial-hood of EPQs. It means that at least some NQs must be analyzed to be adverbs and weaken the claim of stranding analyses. Second and more importantly, EPQ's properties can be a piece of evidence for the Neo-Davidsonian separation of thematic predicates from a verbal predicate and its arguments. It has been controversial whether the arguments of a verbal predicate are expressed as the variables of a polyadic predicate as in (24) or a variable of each two-place thematic predicate as in (25). (24) is Davidsonian logical form and (25) is called Neo-Davidsonian logical form.

- (23) Brutus stabs Caesar.
 (24) $\exists e[\text{stab}(e, \text{Brutus}, \text{Caesar})]$
 (25) $\exists e[\text{stab}(e) \wedge \text{Agent}(e, \text{Brutus}) \wedge \text{Theme}(e, \text{Caesar})]$

Though there are pieces of evidence for the separation of the thematic predicates Agent (e, x) and Theme (e, y) from verbal predicates, their semantic independence from argument nominals of a verbal predicate gathered little attention in literature. However, readings along with an EPQ provide clear evidence for the independence of thematic predicates from its associated nominals. As is observed above, Theme (e, y) are quantified independently of its host nominal in the object when an EPQ is involved. The NQ of the object just indicate the number of individuals who can be chosen as a theme of an event and the second NQ of an EPQ indicate the number of themes per event. Moreover, as is observed in section 2.2, a distributive reading is obtained even when the subject nominal is bare. Thus, Agent (e, x) is also quantified independently of its host nominal in the subject. Thus, it is required that the variable for argument nominals and the variable for thematic predicates Agent (e, x) and Theme (e, y) are distinguished at least in the semantic component of grammar. It means that the interpretation of an argument of a verb and that of a thematic predicate is independent of each other. Thus, thematic predicates Agent (e, x) and Theme (e, y) exist independently of verbal arguments.

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