

A Compositional Semantics for Comitative Constructions

Introduction Comitative Constructions (CCs) are expressions consisting of two NPs connected by a comitative preposition such as the English *with*, German *mit*, French *avec*, Portuguese *com*, Spanish *con*, Russian *s*, or Polish *z*, and are attested for a vast number of languages. Three interpretations have previously been identified as being available for CCs. We will refer to these interpretations as accompanitive, conjunctive and inclusive. The focus of the majority of previous approaches to CCs lies on syntactic aspects. Ladusaw (1989), McNally (1989), Dalrymple et al. (1998), Vassilieva and Larson (2005) and Feldman (2002) also discuss some semantic issues, but none of them offers a coherent and formally satisfactory analysis uniformly accounting for accompanitive, conjunctive and inclusive readings. The objective of this paper is to propose a compositional semantic analysis which uniformly accounts for all three of these interpretations. Since CCs have a particularly high frequency in Slavic languages such as Polish, where each of these three interpretations can be observed, we will take Polish data into consideration.

The Data Polish CCs may be ambiguous between accompanitive, conjunctive and inclusive readings. This is illustrated in (1), where the three readings of the CC *oni z Janem* 'they with Jan' are indicated by the three different translations: T1, T2 and T3.

- (1) *Oni z Janem wyjechali.*
 they with Jan_INSTR left

T1: 'They left with Jan.' / T2: 'They and Jan left.' / T3: 'Jan and he / they left.'

In assuming that the domain of individuals contains just three individuals: Jan, Iwo and Wit, the intuition behind the three readings can be explained as follows: Under the accompanitive reading, indicated by T1, the pronoun *oni* refers to Iwo and Wit, and Jan accompanies the two of them in the event of leaving, denoted by the predicate. The denotation of the entire CC *oni z Janem* can thus be assumed to include the denotation of the pronoun, i.e., Iwo and Wit, and the denotation of the NP *Janem*, i.e., Jan, but these denotations are disjoint. Under the conjunctive interpretation, indicated by T2, the pronoun refers to Iwo and Wit. These two individuals and the individual denoted by the NP *Janem*, i.e., Jan, are members of a set of equal participants involved in the event of leaving. The pronoun *oni* and the NP *Janem* thus function as conjuncts, being in the same thematic relationship to the predicate. In this case, it is reasonable to assume that the denotation of the entire CC *oni z Janem* involves an entity composed of the denotation of the first NP and the denotation of the second NP. Finally, under the inclusive interpretation, indicated by T3, the denotation of the pronoun *oni* includes Jan and either Iwo, or Wit, or Iwo and Wit. The denotation of the NP *Janem* is thus a proper part of the denotation of the pronoun. The availability of these three interpretations is supported by the different behavior of CCs under the corresponding interpretations with regard to (1) presuppositional effects, (2) the (in)ability to occur in collective and distributive contexts, (3) the assignment of the contrastive focus, and (4) a number of coreference phenomena, such as the control of personal, relative, reflexive, possessive, and possessive reflexive pronouns, and PRO subjects (appropriate examples will be provided in the full paper).

The Analysis To uniformly account for accompanitive, conjunctive and inclusive readings of CCs, we make the following assumptions: (i) Both singular and plural individual terms always denote subsets of the domain of individuals. Thereby, singular individuals denote singleton sets and plural individuals denote sets containing more than one individual. The denotation of conjoined singular entities is made up of singleton sets involving these entities by combining them via the set union operation. (ii) The denotation of individual terms does not change in collective and distributive contexts, and the collective and distributive interpretations are provided by predicates or corresponding operators. (iii) Verbal predicates

have an obligatory argument position for events in addition to positions for arguments. The event variable is assumed to be a variable over a set of atomic events instead of an atomic event variable. Thereby, singular events are represented using variables over singleton sets, and plural events are represented using variables over sets including more than one element. (iv) The event variable in the logical form of inherently collective predicates always ranges over singleton sets, and the cardinality of the argument associated with the subject is greater than 1. Inherently distributive predicates combine with expressions denoting (possible singleton) sets of individuals such that for all nonempty subsets of these sets, there is a singleton subset of events, and the predicates apply to these singleton subsets of events and the non-empty subsets of individuals. The semantic representation of neutral predicates, which can occur in both collective and distributive contexts, does not provide any restrictions on the cardinality of the arguments or any other restrictions. (v) The three interpretations manifest in (1) are triggered by the preposition *z*, which is in its comitative usage semantically ambiguous between the accompanitive, conjunctive and inclusive readings.

This ambiguity is licensed by three different basic translations of *z* in (2), where *X* and *Y* are variables over sets of individual entities, *E* is a variable over a set of event entities, and *P* is a predicate variable. The logical forms in (2) are terms of a semantic representation language incorporating set-shaped terms.

(2) a. the accompanitive *z*

$\lambda Y \lambda X \lambda P. \exists E (P(E, X) \wedge (X \neq Y) \wedge \forall E' ((E \supset E' \wedge E' \neq 0) \rightarrow (P(E', X) \wedge \exists E'' accompany(E'', Y, X))))$

b. the conjunctive *z*: $\lambda Y \lambda X \lambda P. \exists E P(E, X \cup Y)$

c. the inclusive *z*: $\lambda Y \lambda X \lambda P. \exists E P(E, X) \wedge X \supset Y$

The logical representation of each meaning of (1) is computed in the same way, i.e., by combining one of the translations of the preposition *z* with the basic translation of the NP *Janem*, i.e., the set including Jan, and then with the basic translation of the plural pronoun *oni*, i.e., a set of individual variables, by functional application. The translation of the sentence results in the combination of the translation of the subject NP, i.e., the CC *oni z Janem*, and the basic translation of the predicate. Thereby, the subject NP acts as the functor and the predicate as its argument. Depending on whether the translation in (2a), (2b) or (2c) is used, the logical form of (1) will result in (3a), (3b) or (3c), respectively (by assuming that the domain of individuals only contains Jan, Iwo and Wit). These logical forms represent the accompanitive, conjunctive and inclusive interpretations available for (1) and indicated by T1, T2 and T3, respectively.

(3) a. accompanitive interpretation

$\exists E (leave(E, \{i, w\}) \wedge \forall E' ((E \supset E' \wedge E' \neq 0) \rightarrow (leave(E', \{i, w\}) \wedge \exists E'' accompany(E'', \{i, w\}, \{j\}))))$

b. conjunctive interpretation: $\exists E leave(E, \{i, w\} \cup \{j\})$

c. inclusive interpretation: $\exists E leave(E, \{i, j\}) / \exists E leave(E, \{w, j\}) / \exists E leave(E, \{i, w, j\})$

Summary We discussed three readings of CCs, the accompanitive, conjunctive and inclusive reading, with reference to Polish. We have indicated that CCs are a cross-linguistic phenomenon, which can be observed in a vast number of languages worldwide. We proposed a semantic analysis of CCs using set-shaped terms for representing event and individual variables, and the common set-theoretical operations such as set union, intersection, and the relation of (proper) superset. The analysis uniformly accounts for the three readings. We have focused on Polish data, but our proposal can possibly be applied to other languages as well.

References Dalrymple, M., I. Hayrapetian, and T. King (1998). The Semantics of the Russian Comitative Construction. *Natural Language and Linguistic Theory* 16, 597-631. / Feldman, A. (2002). On NP-Coordination. In *Yearbook 2002*, pp. 39-67. Utrecht Institute of Linguistics OTS. / Ladusaw, W. A. (1989). Group Reference and the Plural Pronoun Construction. In *Papers on the Plural Pronoun Construction and Comitative Coordination*, pp. 1.7. UCSC Syntax Research Center Report SRC-89-02. / McNally, L. (1989). Comitative Coordination in Russian. In *Papers on the Plural Pronoun Construction and Comitative Coordination*, pp. 9-15. UCSC Syntax Research Center Report SRC-89-02. / Vassilieva, M. B. and R. K. Larson (2005). The Semantics of the Plural Pronoun Construction. *Natural Language Semantics* 13, 101.124.