Implicit Object Constructions and the (In)transitivity Continuum

Mari Broman Olsen, Philip Resnik*
University of Maryland

1. Introduction

Explaining variations in the number of arguments realized by verbs is a core issue at the syntax-semantics interface (see discussion and references in Rappaport Hovav and Levin (to appear)). A long-discussed problem is how to analyze implicit direct objects, under either an indefinite (unspecified, existential) (Levin 1993) or obligatorily definite (specified, referential) interpretation (Cote 1992, Rispoli 1992), as in (1a–b), respectively.

(1)   a. Benjamin cooked [something] this morning.
     b. Benjamin won [the game] this morning.

Early accounts eliminate the object from the syntax via an "object deletion" transformation (Katz and Postal 1964, Browne, 1971). More recent work has observed that implicit object constructions have aspectual constraints (Mittwoch 1982, Brisson 1994) and that omitted objects must be "typical," inferable, or partially specified by the semantics of the verb (Brisson 1994, Fellbaum and Kegl 1989, Lehrer 1970, Mittwoch 1982, Rice 1988). Recently Resnik (1996) has substantiated and formalized the inferability claim using an information-theoretic account of selectional constraints. In this paper we show that the aspectual and selectional criteria for implicit objects are accounted for within the framework described by Hopper and Thompson's (1980; H&T) transitivity hypothesis. We locate English implicit object constructions on a continuum of transitivity, with indefinite implicit object constructions (1a) closer to intransitives, and definite implicit object constructions (1b) closer to transitives. Our account unifies the apparently disparate aspectual and selectional criteria for these constructions and provides additional evidence for distinguishing indefinite and definite implicit objects.

2. Transitivity Hypothesis

A number of authors have proposed that the realization of a clause as transitive depends on a number of conceptual, semantic, and morphosyntactic properties of the event and its participants (Croft 1990, Dowty 1991, Kemmer 1993, Hopper and Thompson 1980). H&T describe the transitivity continuum as a composite of scores on the morphosyntactic and semantic parameters in (2).

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They propose the transitivity hypothesis in (3).

(3)  *Transitivity Hypothesis:* "If two clauses (a) and (b) in a language differ in that (a) is higher in Transitivity according to any of the features [in (2)A-J] above, then, if a concomitant grammatical or semantic difference appears elsewhere in clauses, that difference will also show (a) to be higher in Transitivity" (Hopper and Thompson 1980:255, ex. (9)).

In this paper we focus on aspect and object individuation, properties implicated in the implicit object constructions. According to H&T, clauses that show telic aspect and individuated objects are more transitive than those with atelic aspect and nonindividuated objects. Furthermore, if aspect and individuation covary, telicity and high individuation should occur together in transitive clauses, and atelicity and low individuation together in intransitive clauses. In the next two sections we discuss each feature, first locating the implicit object constructions on the transitivity continuum between overt transitives and intransitives, and then locating indefinite and definite implicit objects with respect to each other.

3. Telicity

H&T's *ASPECT* feature covers two types of aspect: telicity (the inherent boundedness of events denoted by verbs, e.g. *win*, in (4a)) and perfectivity (the completion of an event, as in (4b)).

(4)  a. Benjamin will *win* (the race), (cf. *run*)
    b. Benjamin had *won* the race, (cf. was *winning/running*)

They adopt the perfective/imperfective terminology in their discussion of the transitivity hypothesis, but primarily use telicity in their discussion of the discourse function of transitivity (H&T:1980:271). We focus in this paper on
telicity. As (5) shows, an entailment relation holds between the progressive and the perfect for atelic verbs like run but not for telic verbs like win.

(5)  
a. Benjamin was running entails he has run.  
b. Benjamin was winning does not entail he has won.

The relationship between telicity and the presence of an overt object has been much discussed (cf. Dowty 1979, van Hout 1996, Tenny 1994). According to Tenny (1994:11), "delimitedness" governs most of the mapping between lexical and syntactic structure, with arguments that measure delimitedness appearing as direct objects. Van Hout (1996:123) makes a stronger claim, that telic verbs "require projection of an argument in direct object position." Data cited in support of these hypotheses include the spray/load constructions, in which the direct object argument measures the event: in (6a) the truck is full (whether or not the hay is gone), and in (6b) the hay is all on the truck (whether or not the truck is full). In contrast, the event in (6c) is not bounded at all.²

(6)  
a. Benjamin loaded the truck with the hay.  
b. Benjamin loaded the hay on the truck.  
c. Benjamin ran.

The implicit object constructions contrast with overt object constructions on telicity as the transitivity hypothesis predicts. Absence of an overt object makes implicit objects low on the PARTICIPANTS feature and hence lower in transitivity. They are also less likely to have telic ASPECT. Mittwoch (1982), for example, claims that all indefinite implicit objects of the type in (7b) are atelic activities, like the intransitive in (6c) above, whereas their counterparts with syntactically present objects are telic accomplishments, as in (7a).

(7)  
a. Benjamin ate his eggs. telic, accomplishment  
b. Benjamin ate. indefinite, atelic, activity

Furthermore, indefinite and definite implicit objects differ on the relevance of the telicity feature. Mittwoch argues that inherently telic verbs are prohibited from occurring with indefinite implicit objects, since the indefinite object constructions must have activity interpretations. Thus telic verbs require either an overt object or, if the object is implicit, one that has a definite interpretation. As (8) shows, the telic verb win only has a definite interpretation. It is therefore infelicitous to claim ignorance of the implicit object.

(8)  
a. Benjamin won the race.  
b. Benjamin won, *but I don't know what.

Allerton (1975) supports this characterization, observing that indefinite implicit objects occur with "verbs whose activity may be viewed as self-sufficient without an object," whereas definite implicit objects occur when "the meaning of the verb is somehow incomplete without mention of a particular object" (emphasis in
original). In contrast, atelic verbs with implicit objects have indefinite interpretations, as Mittwoch points out. We note that they may also have definite interpretations: the object in (7b) may be interpreted as a salient meal, as in (9) (cf. Olsen in press) for more examples of telic interpretations of atelic verbs. Mittwoch also observes in a footnote that indefinite implicit objects could have a telic interpretation in the appropriate context, as in *I won't have dinner with you: I have already eaten.*

(9) Do we need to stop at McDonald's? No, Benjamin ate.

Thus, telicity and the transitivity hypothesis provide evidence that the implicit objects are between intransitives and transitives on a continuum, and allow us to characterize the two separate constructions in terms of that continuum: definite implicit object clauses behave more like telic transitives, and indefinite implicit objects behave more like atelic intransitives.

4. Individuation

For H&T, **individuation** refers "to the distinctness of the patient from A[gent]... and to its distinctness from its own background" (p. 253). That is, H&T consider individuation of the object in terms of its distinctness from two of the three elements of a canonical transitive (agent-verb-patient), as shown in the first two rows in (10).

(10)  
- **Low Individuation of Object**  
- **High Individuation of Object**
- from Agent  
  - Eli shaved himself.  
  - Eli shaved Gus.
- from Patient  
  - Eli likes dogs.  
  - Eli likes Lassie.
- from Verb  
  - Eli drank a cold drink.  
  - Eli drank kerosene.

Individuation of the object from the agent contrasts low transitivity reflexive objects (as in *Eli shaved himself*) with high transitivity objects clearly distinguished from the agent (as in *Eli shaved Gus*); all the constructions under consideration here are individuated in this respect. Individuation of the object from itself refers to the distinguishability of the direct objects from others of their class or kind, weighting as high in transitivity those objects, among others, that are proper nouns (vs. common) and referential definite objects (vs. non-referential and indefinite). Definite implicit object constructions are therefore higher in transitivity on this property than both intransitives and indefinite implicit object constructions.

We extend individuation to cover the third element in a canonical transitive, namely the object's "distinctness" from the verb—in essence, adding the final row of the table in (10). This third facet of individuation measures the extent to which the direct object replicates information provided by the verb. Verb-object individuation is, therefore, another way of describing the **selectional** relationship between the verb and the object. Selection restrictions have traditionally been construed as semantic information carried by the verb about its
arguments, both in their role as constraints (e.g. *Eli drank cookies) and as features transferred to underspecified arguments (e.g. Eli drank it implying that it is [+LIQUID]. Resnik's (1996) theory, going beyond simple Boolean features, makes it possible to place selectional relationships on a continuum—that is, to say why drank a drink is intuitively a "better" verb-object combination than drank kerosene, which is in turn better than Eli drank cookies. This is done, in sum, by formalizing in quantitative (probabilistic) terms the extent to which the verb predicts the conceptual type of its argument, using a quantitative measure based on "information" in the sense of Shannon (1949). The measure assigns the ratings in (11), for example. (See Resnik 1996 for more details.)

(11)  Eli drank some wine [7.65] / kerosene [5.61] / sincerity [0.00].

To phrase this in terms of H&T's continuum, the more strongly a verb selects its object, the more information about the object is carried by the verb itself, and thus the less individuated the object is from the verb. A very strongly selected object such as tune in Eli sang a tune, carries relatively little new semantic information. It is therefore less individuated from the verb. In the same sense a reflexive object in a sentence like Eli shaved himself carries little new information about an agent and is therefore less individuated from it.

The cognate object construction is at the low transitivity end of the individuation spectrum; as in (12), otherwise intransitive verbs usually take objects that are morphologically and semantically related to the verb (see Macfarland 1995 and references therein). Consistent with the transitivity hypothesis, low object individuation correlates with other low transitivity properties; as Rice (1988:207–208) notes, for example, the verbs participating in cognate object constructions generally refer to "predications that are considered to be intransitive" and "in many languages the verb is treated lexically and syntactically as intransitive."

(12)  a. Benjamin laughed a silly laugh/*a silly chuckle.4
     b. Benjamin smiled his winning smile/*his winning grin.

Indeed, some have claimed that cognate object constructions are licensed only if the object is modified, so that it is more individuated from the verb. In Rice's (1988:208) words, it must convey "conceptual differentiation of process and processed object," as in her example, reproduced in (13).5

(13)  a. *Susan dreamed a dream.
     b. Susan dreamed a frightful dream.
     c. Susan dreamed the dream she used to dream as a child.
     d. Susan dreams that dream almost nightly. (Rice 1988:208, ex. 49)

The modifications in (13) involve higher object-object individuation, differentiating the object from other objects of the same type by adjectival modification (13b), definiteness (13c), and referentiality (13d). The presence of the overt object (a high value on PARTICIPANTS) therefore covaries with higher
INDIVIDUATION values, Macfarland (1995) also argues that the cognate object construction always denotes a [+telic] result, another high transitivity feature.

In sum, the pattern of behavior for cognate object verbs is consistent with the transitivity hypothesis, expanded to include integration of selectional constraints with object individuation. The semantically intransitive nature of cognate object verbs correlates with strong selectional constraints—that is, low individuation of the direct object with respect to the verb. The expression of cognate object verbs in syntactically transitive clauses correlates with higher individuation of the direct object with respect to its own background.

Turning to implicit object constructions, if we have appropriately extended the individuation feature of the transitivity hypothesis with respect to selectional constraints, we would again expect a lesser degree of object individuation (one facet of which is stronger selectional constraints) to correlate with a lesser degree of transitivity on other dimensions. Indeed, this is the case. In a study applying the quantitative theory of selectional constraints (replicated using a corpus of text, a corpus of transcribed speech, and human subject norms as sources for the probability estimates required by the theory), Resnik (1996:148) found that "[transitive] verbs participating on one of the implicit object alternations have a significantly higher strength of selectional preference for the direct object than verbs that do not." That is, the ability to appear in a clause with an implicit object—manifesting syntactic intransitivity, along with the correlated aspectual properties as described in the previous section—is associated with verbs having strong selectional constraints, as we predict (e.g. (14b) and (14d)). In contrast, verbs like those in (15b) and (15d), having weak selectional constraints, are not licensed in implicit object clauses, which are syntactically intransitive: because the verbs carry so little semantic information about their objects, only high verb-object individuation is possible.

(14)  a. Benjamin ate lunch/a sandwich/something yummy.
     b. Benjamin ate.
     c. Benjamin called me/home/his grandparents.
     d. Benjamin called.

(15)  a. Benjamin wanted a trike/help/more food.
     b. *Benjamin wanted.
     c. Benjamin found a toy/help/my keys.
     d. *Benjamin found.

A subsequent set of experiments confirmed the connection between strong selection and implicit objects, showing via a corpus analysis (replicated using several different corpora) that there is a statistically significant correlation between a verb's selectional preference strength (in present terms, the degree of object individuation that it permits) and its frequency of occurrence in an implicit object construction. Moreover, although some strongly selecting verbs fail to appear with implicit objects (apparently owing to their aspectual properties), the converse is never true; Resnik (1993:88) therefore concludes that "strong selection is a necessary condition for object omission."
The "typicality" facts for implicit objects thus fit into the transitivity continuum: omissibility of the direct object in these cases can be regarded as a connection between argument realizations displaying more transitivity properties and realizations displaying fewer. In addition, the view of the transitivity spectrum as a true continuum, and not just an ordered set of discrete points, is supported by Resnik's finding that the frequency of implicit object constructions varies continuously across verbs in a corpus (rather than being an all-or-nothing phenomenon) and that it correlates with a real-valued measure of selectional preference strength.

Resnik (1993) also tested whether there was a difference between definite and indefinite implicit object alternations, in terms of a correlation between selectional preference and implicit object instances. He hypothesizes (Resnik 1993:88-89) that "if a verb requires that an antecedent be available in the discourse context, the verb itself might not contribute as much information about the omitted object." Similarly, the transitivity hypothesis ranks clauses with definite implicit objects—those that have discourse antecedents and telic aspect—as higher in transitivity than clauses with indefinite implicit objects.

Stated in our present terms, one would therefore expect to find the definiteness requirement associated with other features connected with high transitivity, such as greater verb-OB ject INDIVIDUATION, that is, weaker selectional preference, and in fact Resnik's data confirms this prediction. Using a set of verbs grouped by Lehrer (1970) according to the (in)definite status of their implicit objects, Resnik found implicit object verbs that require the definite reading select less strongly than do verbs permitting the indefinite reading. The difference was statistically highly significant when using estimates of selectional preference strength computed using the Brown corpus of American English (Francis 1982). It did not, however, reach significance using estimates based on parental turns in the CHILDES database of parent-child speech (MacWhinney 1991), although the trend was in the right direction. (See Resnik, 1993 for details.)

Results correlating indefinite implicit objects with weaker selection suggest that the object individuation property not only ranks the implicit object constructions between the transitive and the intransitive on the transitivity continuum, it provides finer-grained evidence for locating the two implicit object constructions with respect to each other. The generalization appears to be that definite implicit object constructions are closer in behavior to definite, referential, individuated transitives, while indefinite implicit object constructions belong closer to the other end of the spectrum, where one finds the cognate object constructions and strict intransitives. Moreover, H&T's individuation property (elaborated here to include selectional constraints) covaries with aspect as predicted by the transitivity hypothesis, unifying the "typicality" facts and the telicity properties where previously they represented two apparently disparate requirements on the implicit object constructions.
5. Hungarian (In)transitive Conjugations

Additional, cross-linguistic support for integrating selectional constraints into H&T's notion of individuation comes from transitivity facts in Hungarian examined by Hopper and Thompson. We expand on their observations, incorporating more data from their source, Károly (1972). H&T suggest that the Hungarian objective conjugation in (16)-(18) could reasonably be referred to as a "transitive" conjugation, since when an object is both definite and referential, the word order is typically SVO with the verb appearing in an objective conjugation.

(16) Dobja a követ. Hungarian objective: more transitive throw(OBJ) the stone
'He throws the stone.'

(17) A szél fúja a levelet. The wind blows(OBJ) the leaf
'The wind is blowing the leaf'

(18) Péter olvassa az újságot. Peter reads(OBJ) the newspaper
'Peter is reading the newspaper'

In contrast, the "subjective" conjugation is used when the object has low-transitivity properties such as indefiniteness and non-referentiality, as in (19)-(20) or when there is no object at all, as in (21).

(19) Követ dob Hungarian subjective: more intransitive stones throw
'He throws stones.'

(20) Péter újságot olvas Peter paper reads
'Peter is reading a newspaper'

(21) A szél fúj. the wind blows
'The wind is blowing'

Crucially, OV clauses are ungrammatical unless there is "some degree of predictability of [the] O[bject] from the semantic nature of the V[erb]" (H&T:256). As Károly (1972:97) puts it, "The condition of this use is that the intension of the verb be characteristic of the object," a condition met by 'writing homework' in (22a) but not by 'beating a boy' or 'seeing a pencil' in (22b-c). Correspondingly, nominal compounds are licensed where there is semantic predictability between verb and object, as in 'homework writing,' but no compound forms correspond to verbs and objects with a weak selectional relationship, such as 'boy-beating.'
(22) **OV Structure**

| a. leckéť ír homework writes | Compounds
| 'He is doing (writing) his homework' | leckéfrás
| b. *fiút űt boy beats | *fiútétés
| 'He beats boy' | 'boy-beating'
| c. *ceruzát néz pencil see | 'He sees a pencil'

As discussed in the previous section, this semantic predictability is precisely what is measured by selectional preference strength. The present account thus neatly unifies the English implicit object alternations with the alternation between subjective (OV) and objective (VO) conjugation clauses in Hungarian: the alternations in both languages represent more and less transitive variants of argument realization, with strong selection between verb and object—that is, a low degree of individuation of object from verb—being one of a number of covarying low-transitivity properties.7

6. Conclusion

We have shown that the transitivity hypothesis correctly predicts covarying properties in the English implicit object data, linking apparently disparate aspectual and selectional constraints on these constructions. Specifically, the implicit object constructions are less likely than their counterparts with overt objects to have telic interpretations, or semantically individuated objects. In addition, the transitivity properties provide a means to analyze the relationship between the indefinite and definite implicit object constructions and unify the operative properties: we have shown that they represent two distinct locations on the transitivity continuum, with indefinite implicit object constructions behaving more like intransitives and definite implicit object constructions more like transitives, on a range of covarying properties. Furthermore, in our account, the transitivity continuum accommodates selectional constraints, characterized as the degree of individuation of the object from the semantic information carried by the verb about its object and measurable by the quantitative model in Resnik (1993,1996). Additional cross-linguistic support for integrating selectional constraints with individuation came from the Hungarian subjective and objective conjugations.

An intriguing but as yet unexplored question concerns the potential relationship between Resnik's (1993,1996) information-theoretic account of selectional constraints and H&T's proposal that the transitivity spectrum is closely bound up with discourse grounding. Backgrounded material may be distinguished from foregrounded material by the amount of information added to the discourse, as measured against prior context; this is also the intuitive characterization of
weakly versus strongly selected arguments. We therefore conjecture that the relationship between transitivity and discourse new information may also be amenable to an information-theoretic treatment.

Notes

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2 Tenny (1992) is similarly strong. For problems with this claim for English see Jackendoff (1996), inter alia.
3 Though see Levin (1993:35ff.) for the implicit reflexives.
4 Macfarland (p.c.) says that, although these "nonsubcategorized objects are rare, they do, in fact, occur, as her example in (i) shows.
(i) I sat back against the warm wooden backrest, crossed my legs, and smiled the smug grin that always sets Eileen off. (Sharon Zukowski, 1996, Prelude to Death, New York: Dutton, p. 13, my emphasis.)
This does not disprove our claim, that the strongly selected objects (the cognate object) is less individuated from the verb and hence more toward the intransitive end of the spectrum.
5 According to Macfarland (1995), occurrences of unmodified cognate objects are licensed but rare (9.4% of her collection of 2,000+ tokens) [check]. In addition, she notes that the passive cognate object construction requires identification of both process and result subevents, which may be accomplished through modification.
6 See Olsen and Macfarland (1996) for further discussion of the covariation of transitivity features in this construction.
7 Further cross-linguistic support may be available, given that H&T mention a number of languages in which "quite analogous facts" to Hungarian are found. For example, we are aware that Turkish manifests a similar patterning, in which accusative marking may be omitted and objects incorporated, as long as they are indefinite and/or non-specific (Beryl Hoffman, p.c.).

References

Macfarland, Talke. 1995. Cognate Objects and the Argument/ Adjunct Distinction in English, Ph.D. diss., Northwestern University, Evanston, IL.


