# **Constructional semantics as a limit to grammatical alternation: The two genitives of English**

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## Abstract

It has often been claimed that the distribution of the *s*-genitive and the *of*-genitive is determined by considerations of information structure, more specifically by linear precedence preferences related to animacy, givenness, or syntactic weight. This paper shows that such claims are untenable on empirical as well as theoretical grounds. First, corpus analyses simply do not bear out the predictions made by these claims. Second, such claims assume that the two genitives are semantically equivalent. I show that this assumption is wrong and offer a systematic account of the *s*-genitive and the *of*-genitive as distinct semantic-role constructions, arguing that the former encodes a possessor-possessee relation and the latter a part-whole relation unless the head noun itself inherently specifies a different relation. Only in the case of such an inherently specified relation does the possibility arise that information structure may play a role. I then show that in such cases animacy and (to a lesser degree) length have an influence, but that givenness has an optional stylistic influence at best.

## 1. Introduction

Wherever a language has two constructions with the same apparent syntactic function, the question arises as to what conditions their distribution. Unless they are in free variation, there seem to be two main possibilities: either the two constructions differ in their discourse-functional properties (i.e. they encode alternative ways of structuring the information flow), or they differ in their semantics (i.e. they either have different constraints on the lexical items they occur with, or they differ in their semantic import).

English has two nominal modification constructions that are traditionally referred to as *genitives*: one where the modifier is morphologically marked with the possessive clitic -'s and precedes the head noun, and one where the modifier is syntactically marked by the preposition of and follows the head noun. The two constructions, traditionally referred to as s-genitive and of-genitive, are shown in (1a) and (1b) respectively:

- (1) a. [NP<sub>mod</sub>'s N<sub>head</sub>] e.g. the university's budget
  - b. [DET N<sub>head</sub> of NP<sub>mod</sub>]
    e.g. the budget of the university

It is received wisdom that the distribution of these two constructions is governed by information structure (in a broad sense of the term). It has repeatedly been claimed that they are primarily discourse-pragmatic alternatives, conditioned by linear precedence preferences related to animacy (e.g., Jespersen 1949; R. Hawkins 1981; cf. also Quirk et al. 1985: §17.39; Jucker 1993), topicality (e.g., Standwell 1982; Osselton 1988; cf. also Altenberg 1980; Quirk et al. 1985: §17.45), or a combination of the two (Deane 1987, 1992). I will refer to this hypothesis as the *discoursefunctional hypothesis*.

In this paper, I will take issue with these claims. I will show that there are two problems with an analysis of the two genitives that accounts for their distribution primarily in terms of information structure. First, any analysis of a pair of constructions in terms of information structure has to assume that the two constructions are semantically more or less equivalent; this assumption is not warranted in the case of the two genitives. Second, text counts simply do not bear out the predictions concerning linear precedence made by such an analysis.

I will argue instead that the two genitives are semantically distinct constructions, whose primary function is the assigning of semantic roles to their head and modifier slots. This claim, which I will call the *semantic hypothesis*, may seem difficult to substantiate in light of the fact that the meanings of the two constructions are notoriously hard to pin down. It has been claimed that they encode "a grab-bag of relations" (Givón 1993: 264) and even that "any attempt to sum up 'the meaning' of the genitive is doomed" (Strang 1962: 93). I will show that while the two constructions indeed appear to encode a "grab-bag" of relations, their semantics can be accounted for in a principled way in the framework of Construction Grammar (cf. Goldberg 1995), although such an analysis requires a relatively abstract approach to semantic roles. I will propose an analysis which accounts for the fact that there is a vast variety of relations encodeable by both constructions as well as for the fact that for each construction there is a core set of semantic relations that cannot be encoded by the other.

I will not dismiss information structure entirely as a factor in the distribution of the two genitives. On the contrary, I will show that once the two constructions are properly characterized semantically, it is possible to delimit a subset of genitives whose distribution is to some degree governed by factors related to information flow (namely animacy and length).

A word on abstractness seems in order, since it has become a concept non grata to many linguists. Even within the field of cognitive linguistics, which I consider Construction Grammar to be a part of, there is considerable disagreement as to how abstract an analysis may be. At one extreme are discourse-centered approaches like Hopper's Emergent Grammar that eschew any kind of abstraction (e.g., Hopper 1998), at the other extreme is Langacker's Cognitive Grammar, which proposes highly schematic analyses of many linguistic phenomena (e.g., Langacker 1990). Both approaches have their merits. The first essentially regards language as a repository of remembered pieces of discourse and views any regularities as partial and emergent generalizations, partial though they may be, and attempts to uncover the systematicity inherent in them (and to relate this systematicity to general cognitive principles).

In this paper, I focus on the systematic, general aspects of the two genitives rather than on clusters of concrete manifestations. This is not to deny that there are such clusters, i.e. that for both constructions there are recurring, highly entrenched instances and low-level generalizations. However, this paper aims to uncover the general properties of the two constructions and thus to delineate the semantic space within which such clusters may occur.

The paper is structured as follows: Section two will outline the basic tenets of Construction Grammar, focusing on those aspects relevant to the issue at hand. Section three will discuss the discourse-functional and the semantic hypothesis in some more detail and outline the *a priori* advantages and problems of each. Section four will show that an analysis of the two constructions in terms of information structure is empirically inadequate, and section five will propose a semantic analysis that overcomes the apparent problems outlined in section three. Finally, section six will return to the issue of information structure and draw some general conclusions about the relation between semantics and discourse-pragmatic factors.

## 2. Some basic tenets of Construction Grammar

Construction Grammar is a non-derivational, non-modular theory of the grammatical knowledge of speakers. Unlike most current linguistic theories (both generative and discourse-analytical ones), it views the *construction* as

the fundamental unit of grammatical organization, where *construction* is defined as follows: "C is a construction iff<sub>def</sub> C is a form-meaning pair  $\langle F_i, S_i \rangle$  such that some aspect of  $F_i$  or some aspect of  $S_i$  is not strictly predictable from C's component parts or from other previously established constructions." (Goldberg 1995: 4) Meaning must be understood here in a broad sense, as encompassing semantic properties in the traditional sense of the term as well as frame-semantic encyclopedic knowledge, pragmatics, and information structure (Goldberg 1996: 69). In other words, a construction is any formal element that is directly associated with a particular meaning, pragmatic function, or discourse context.

Such formal elements may be single morphemes (like give), multimorphemic words, like care-giver, or fully or partially filled idioms (like Give me five!, or [SUBJ be given to  $N_{activity}$ ], as in Sam is not given to selfanalysis). Crucially, they may also be abstract syntactic patterns. Two abstract construction types that are important to the following discussion are argument-structure constructions, i.e. formal patterns whose elements are directly linked to particular configurations of semantic roles, and information-structure constructions, i.e. formal patterns whose elements are linked to particular ways of packaging information structure.

As an example of an argument-structure construction, take the English double-object construction [SUBJ V OBJ OBJ]. The double-object (or *ditransitive*) construction assigns the semantic roles of *agent*, *recipient*, and theme to the subject, first object, and second object respectively, irrespective of the particular verbs which occur in this construction. This means that the construction itself imparts the meaning 'transfer' even with verbs that do not specify this notion as part of their lexical semantics. This is shown by the use of hit in Pat hit Chris the ball. Hit is a two-participant verb whose meaning can be roughly glossed as '(some part of) X comes into forceful contact with (some part of) Y'. Clearly, nothing in its meaning points to a transfer of Y to some third participant. However, a sentence like Pat hit Chris the ball will consistently receive the interpretation 'Pat transferred the ball to Chris by coming into forceful contact with it' (cf. Goldberg 1995: 34-35). In other words, constructions may add properties that are unspecified or underspecified in more specific constructions or lexical items. For example, the verb hit only specifies an Agent (a Hitter) and a Patient (a Hittee). These are compatible with two of the roles specified by the double object construction. Since *hit* does not specify a third role, this can be added by the double object construction itself.

As a well-known example of an information-structure construction, take the two verb-particle constructions [SUBJ V OBJ PRT], as in *Diane pushed*  *Billy over*, and [SUBJ V PRT OBJ], as in *Diane pushed over Billy*. These constructions differ in terms of the *activation state* (cf. Chafe 1994; Lambrecht 1994) of their constituents. The first construction assigns the activation state *active* to the object and is thus only compatible with discourse contexts where the object refers to given information, while the second construction assigns the activation state *inactive* to the object and is thus used in situations where the object refers to new information (cf. e.g., Chen 1986 or Gries, this volume, for a more detailed analysis of these constructions).

Any actual utterance larger than a word is a simultaneous manifestation of several constructions. For example, the sentence *Pat hit Chris the ball* instantiates the subject-predicate construction (i.e. [SUBJ PRED]), the double-object construction (i.e. [SUBJ V OBJ OBJ]/'X transfers Y to Z'), the past tense construction (i.e. [V-ed]/'past'), the noun-phrase construction, and the lexical constructions corresponding to the individual words (cf. Goldberg 1996: 68).

A construction that is a (full or partial) manifestation of a more general construction is said to *inherit* that more general construction. For example, the double-object construction inherits the subject-predicate construction: it is a more specific construction which inherits the form [SUBJ PRED] and adds its own specifications, namely the exact type of verb-phrase instantiating the predicate (i.e. [VP V NP NP]), as well as a particular configuration of semantic roles (i.e. (agent, theme, recipient)).

What is crucial to the analysis of the English genitives which I will present below is that I assume a type of inheritance referred to as *inheritance with overrides* or *normal mode inheritance* (cf. Goldberg 1995: 73–74). This refers to a type of inheritance that allows a more specific construction to override some of the properties of a more general construction that it inherits. More precisely, if a more specific construction is associated with some formal or semantic property that is in conflict with a property of the more general construction, the property of the more specific construction prevails.<sup>1</sup> I will assume, uncontroversially, that abstract formal patterns are more general than specific subclasses of words, which in turn are more general than individual lexical items.

The idea of inheritance with overrides can account for exceptions to constructional meaning based on specific classes of lexical items or individual lexical items. As an example of an exception based on a class of lexical items, consider a class of verbs that routinely occur in the double-object construction and which we could call CHARGE verbs: *bill, charge, fine, tax,* etc. – a subclass of Levin's BILL verbs (cf. Levin 1993: 274).

CHARGE verbs specify three semantic roles: an agent (the person doing the charging), a theme (the amount charged), and an animate source (the person charged). Of these three roles, the first two match the argument roles of the construction and are thus unproblematic. However, the third role clashes with that specified by the construction: a source is not a recipient, it is the opposite of a recipient. Under the assumption that verb classes are more specific than formal patterns, the CHARGE class overrides the construction's semantics, and this is why the first object in a sentence like *They charged* me \$20 is interpreted as a source, not as a recipient.

As an example of an exception based on a particular lexical item, take the verb *envy*, which specifies three participant roles: an Envy-er (a kind of Experiencer), an Envy-ee (a kind of Theme), and a Thing-Envied (a kind of Stimulus). These roles clash with those specified by the double object construction (agent, recipient, theme), but *envy*, being more specific, overrides these specifications.

## 3. The two genitives of English

Let us now restate the two hypotheses concerning the function of the English genitives in Construction Grammar terms.

The discourse-functional hypothesis claims that it is the primary function of the two genitives to provide alternative ways of packaging information flow (cf. Standwell 1982 for a very strong version of this claim). This hypothesis translates into Construction Grammar terms as the claim that the two genitives are *information-structure constructions*. Under this analysis, the *s*-genitive assigns the activation state *active* to the modifier and *inactive* to the head noun, while the *of*-genitive assigns the activation state *active* to the head noun and *inactive* to the modifier. Following the principle that (in English) given information (i.e. an active referent) typically precedes new information (i.e. an inactive referent), the *s*-genitive will be chosen in a discourse context where the referent of the modifier is more strongly activated, while the *of*-genitive will be chosen if the head noun's referent is more strongly activated.

Such an analysis assumes that the two constructions are semantically equivalent: two constructions can only be alternative ways of packaging information flow if they mean the same thing. Given that the two genitives are different with regard to their morphosyntax, this is not an assumption that suggests itself *a priori* (in this respect the two genitives differ, for example, from the two verb-particle constructions mentioned in section two, which differ only with respect to the order of their constituents). However, the two genitives have repeatedly been claimed to be semantically equivalent, both in traditional grammar (e.g., Jespersen 1949: 312; Strang 1964) and in generative grammar (e.g., Chomsky 1970). In fact, the two constructions are often assumed not only to be semantically equivalent, but to be semantically empty (e.g., Kempson 1977: 125; Hudson 1984: 143, 147) and to have a purely syntactic function (e.g., to assign case, cf. Chomsky 1986: 192). The analysis of the two genitives as informationstructure constructions is shown in Figure 1 (Act stands for *activation state;* note also that the diagrams employed here do not show the linear order of constituents).



Figure 1. The two genitives as information-structure constructions

This analysis has two advantages: it accounts for the fact that the meanings of the two genitives are difficult to capture (see further below), and it invokes a well-established discourse-functional principle, given precedes new, which has been shown to interact with constituency order at the clause level in many languages (e.g., Siewierska 1986). However, there are two problems with this analysis. First, it predicts that the sets of semantic relations encoded by the two constructions are identical, which will presently be shown to be false, and second, it makes predictions about information flow that simply do not hold up to empirical testing.

Let us now turn to the semantic hypothesis, i.e. an analysis which claims that the two constructions are first and foremost *semantic-role constructions* (by which I mean non-clausal equivalents of the argument-structure constructions introduced in section two). This analysis claims that the primary function of the two genitives is to assign particular semantic roles to the head noun and the modifier.

As a brief look at the entry on genitives in any reference grammar or dictionary of English shows, the set of semantic relations encoded by the two genitives is very heterogeneous. Any semantic account therefore immediately runs into the problem of how to characterize the semantic roles assigned by the two constructions in a unified way. The magnitude of this task becomes clear when we consider Table 1, which shows some of the semantic relations frequently encoded by one or both of the genitives. Note that there is no theoretical significance attached to the precise labels used to characterize the semantic relations; they are purely descriptive. I have tried to follow traditional terminology or to choose transparent labels where this was not possible.

Note that Table 1 clearly shows that the two constructions are not semantically equivalent. There is some overlap: both constructions can encode the relations characterized here as COMPONENT-WHOLE, AT-TRIBUTE-HOLDER, and PARTICIPANT-EVENT. However, only the *of*-genitive can encode THING-CONSTITUENT, SUBCATEGORY-CATEGORY, SUBPART-WHOLE, and DEPICTION-DEPICTED (I will return to the apparent counterex-amples *his sort* and *Lisa's picture*). On the other hand, the relation TIME-EVENT can only be encoded by the *s*-genitive, and the relations POSSESSEE and INTERPERSONAL RELATION can always be encoded by the *s*-genitive, but only sometimes by the *of*-genitive (I will return to this problem in section five below). Recall, that the fact that the two genitives do not encode the same set of semantic relations is a problem for the discourse-functional hypothesis, while it is unproblematic for a semantic analysis. The problem for the latter lies in finding an appropriate characterization of the semantic roles assigned by the two constructions.

There are two ways in which this issue can be approached in a cognitive linguistic framework: by a prototype analysis that takes one of the semantic relations as basic, and finds a principled way of accounting for all other relations as extensions from this basic prototype; or by a schematic analysis that finds an abstract characterization that covers all and only the relations encoded by the given construction.

Semantic Relation	s-genitive	of-genitive
Possessee-Possessor	Kate's shoes	*the shoes of Kate
	John's train	*the train of John
	the University's budget	the budget of the
	our company's assets	University
		the assets of our company
Interpersonal Relations	your Emily	*the Emily of Diane
-	Kate's girl	*the girl of Kate
	Jody's son	the son of my neighbor
Component-Whole	the baby's eyes	the eyes of the baby
-	the table's legs	the legs of the table
	the earth's surface	the surface of the earth
Attribute-Holder	Kate's coldness	?the coldness of Kate
(of Attribute)	the desert's beauty	the beauty of the desert
	the car's design	the design of the car
Participant-Event	the fire department's	the investigation of the fire
-	investigation	department
Time-Event	last year's Olympics	??the Olympics of last
	yesterday's lecture	year
		??the lecture of yesterday
Thing-Constituent Material	*the/a silk's dress	a dress of silk
-	*isolation's sense	a sense of isolation
Subcategory-Category	*the wood's dark kind	a dark kind of wood
	(his sort)	this sort of person
Subpart-Whole (quantity)	*the population's 50%	50% of the population
• • • • • • • •	*the company's big chunk	a big chunk of the
	*the water's glass	company
	*the oranges' bowl	a glass of water
	-	a bowl of oranges
Depiction-Depicted	(Lisa's picture)	a picture of Lisa
-	??the table's picture	a picture of the table
	*the riot's footage	the footage of the riot

Table 1. Major semantic relations encodeable by the s-genitive and the of-genitive

The first approach has been taken with respect to the *s*-genitive by Taylor (1989a, b, cf. also 1996, ch. 13) and Nikiforidou (1991). Both take POSSESSION (in the narrow sense of 'ownership') to be the prototypical meaning of this construction. Taylor defines this notion by reference to a prototypical situation along the following lines:

## The possession prototype

There is a relation between (i) a possessor, which is a "specific human being", and (ii) a possessed, which is a "specific concrete thing". The relation is such that (iii) "for each thing

possessed there is only one possessor". The possessor (iv) has "the right to make use of the possessed" which (v) is "invested in him [by] virtue of a transaction". The possessor (vi) is also "responsible for the possessed, he is expected ... to maintain it in good condition". In order for this to be possible, (vii) "possessor and possessed need to be in close spatial proximity" and (viii) "the relation ... is a long term one" (Taylor 1989b: 202, cf. also 1989a: 678-679, 1996: 340).

Semantic relations other than possession are analyzed as non-central members of the category defined by this prototype, i.e. members that share some, but not all, of these properties. For example, in *John's wife* (an INTERPERSONAL RELATION according to the terminology used in Table 1 above), the referent of *wife* is not a "concrete thing" and we would not want to say that John has "the right to use" his wife; however, the other properties concerning the possession prototype hold.

Nikiforidou (1991) takes a different approach. She also takes ownership as central, but she derives the other uses by positing metaphorical mappings (in the sense of Lakoff and Johnson 1980) from ownership to other semantic domains. For example, INTERPERSONAL RELATIONS can be encoded by the *s*-genitive by virtue of the metaphor RELATIVES ARE POSSESSIONS, which also manifests itself in expressions like *She lost her children in the accident* (Nikiforidou 1991: 184).

Stefanowitsch (1998, cf. also 1997) takes a similar approach to the ofgenitive, taking the PART-WHOLE relation as basic and deriving the other uses by metaphorical mappings. For example, INTERPERSONAL RELATIONS can be encoded by the of-genitive by virtue of metaphors like A LOVED PERSON IS A PART, which also manifests itself in expressions like You're a part of me or FAMILIES ARE WHOLES, which also manifests itself in expressions like You're no longer a part of this family.

The analysis of the two genitives as prototypical semantic-role constructions is shown in Figure 2 (the empty Act level indicates that the constructions are compatible with any activation state of the referents).

This type of analysis faces two fundamental problems. First, it has difficulties accounting even for some of the frequently encoded relations. For example, it is unclear how PARTICIPANT-EVENT, as in *the fire department's investigation*, or ATTRIBUTE-HOLDER, as in *Kate's coldness* could be accommodated by Taylor's prototype, since these do not share any of its properties – as Taylor himself notes (cf. Taylor 1989a: 681). Likewise, it is difficult to see what metaphor could derive this relation from

POSSESSION or PART-WHOLE. Nikiforidou posits a mapping EXPERIENCES ARE POSSESSIONS, which is meant to cover EXPERIENCER-EXPERIENCE as well as AGENT-ACTION (cf. Nikiforidou 1991: 177). However, it is unclear why she equates agents and experiencers; moreover, her examples for the mapping are exclusively based on the verb *have*, which seems semantically too abstract to build a convincing metaphorical analysis on.



Figure 2. The two genitives as prototype semantic-role constructions

Second, a prototype analysis (with or without metaphorical mappings) cannot account for the fact that the set of semantic relations encodeable by the two genitives is almost open-ended. For example, given the right context, *Kate's shoes* could refer to the shoes she owns, the shoes she wears, the shoes she dreams of wearing, the shoes she likes, the shoes she regrets not having bought when they were on sale, etc. Not all of these examples can plausibly be related to Taylor's prototype, and of course it is logically impossible to posit an open-ended set of metaphors to account for them.

To avoid problems like this, Langacker (1992, 1993, 1995) takes the second type of approach mentioned above, i.e. a schematic approach, to the two genitives. He analyzes both constructions as manifestations of a general cognitive ability which he calls the *reference-point function*. He characterizes this function as follows: "one entity ... is invoked as a reference point for purposes of establishing mental contact with another" (Langacker

1993: 8). The first entity, the reference point, corresponds to the modifier in both genitive constructions. The second entity, which Langacker calls *target*, corresponds to the head. Langacker assumes that the *s*-genitive evokes the reference-point relation directly (Langacker 1993: 11) and thus has no additional semantic content. The *of*-genitive, on the other hand, evokes the reference-point relation by virtue of the fact that it encodes an *intrinsic relationship* between two entities (cf. Langacker 1995: 69). This account can be represented in the Construction Grammar framework as shown in Figure 3.



Figure 3. The two genitives as abstract semantic-role constructions

This account also runs into several problems. First, the difference in the semantic value of the two genitives is extremely tenuous. Langacker himself comments that the s-genitive is "quite analogous to the of-construction" (Langacker 1995: 69), and that, for example, in *Kennedy's assassination* vs. *the assassination of Kennedy*, the "only difference is that *Kennedy's* profiles the reference-point relationship per se, whereas of Kennedy profiles the relationship of intrinsicness (which has a reference-point relationship as a consequence)" (Langacker 1995: 69). It is unclear what it is about these two examples that justifies this claim, but more importantly, this difference cannot account for the different sets of semantic roles encoded by the two constructions. Following Langacker's account, the s-genitive should be

able to encode any reference-point relationship, and it is thus hard to see why it cannot encode THING-CONSTITUENT (cf. \*the silk's dress), SUBCATEGORY-CATEGORY (cf. \*the wood's dark kind), SUBPART-WHOLE (cf. \*the population's 50%), or DEPICTION-DEPICTED (cf. \*the accident's footage). The of-genitive, on the other hand, should only encode a subset of those semantic relations encodeable by the s-genitive, namely those that are intrinsic. However, note that the of-genitive does not encode a subset of the relations encoded by the s-genitive. Furthermore, it is unclear what is meant by intrinsic. Langacker does not define the term, and it is hard to grasp intuitively what is more intrinsic about, for example, DEPICTION-DEPICTED than POSSESSEE-POSSESSOR or INTERPERSONAL RELATION (both of which allow the of-genitive only under very specific circumstances to be discussed below).

A second problem is that this analysis is overly general: it does not delimit in any way the set of semantic relations that should be encodeable by the two constructions. Where the prototype account (especially in the version with metaphorical mappings) is unable to account for the fact that this set of relations is almost open-ended, the schematic analysis is unable to account for the fact that it is *almost*, but not *entirely*, open-ended.

I will argue that it is possible to combine the advantages of the prototype account and the schematic account in a way that avoids their problems, and that this can be accomplished naturally in the framework of Construction Grammar. First, however, I will return to the discourse-functional hypothesis.

## 4. The discourse-functional hypothesis

As suggested above, the discourse-functional hypothesis makes one wrong prediction with respect to the two genitives, namely that they encode the same set of relations. Still, it seems worthwhile to investigate it a little more closely rather than dismissing it immediately, if only because it has been proposed again and again in the literature, often seemingly independently.

In order to test the hypothesis that the two genitives are informationstructure constructions, I selected three well-established correlates of information structure for investigation: first, animacy of the referents of head and modifier (on the scale human > other animate > inanimate > abstract); second, givenness<sup>2</sup>; and third, length (measured in number of syllables). I extracted fifty examples of each construction from a corpus of spoken American English (the CSPAE, Barlow 1998). I only chose examples that theoretically allow an alternation, i.e. that occur in the other construction at least under some circumstances.<sup>3</sup> Finally, I coded them for all three features mentioned.

The predictions of the discourse-functional hypothesis are straightforward: following the principle that (in English) active referents typically precede inactive ones, the *s*-genitive should be used in the majority of cases where the modifier NP is respectively higher on the animacy hierarchy, more given, or shorter than the head noun, and the *of*-genitive should be used where the opposite is the case. If it is true that it is the *primary function* of the two genitives to package information structure, then we should not only expect the majority of cases to follow these predictions, but this majority should be near-categorical.

Consider Table 2, which shows the results of the corpus analysis for each of the three parameters. Clearly, the predictions are not borne out. Beginning with animacy, it is true that for the majority of *s*-genitives the modifier has a higher animacy value than the head. However, the same holds true for the *of*-genitive. The only significant difference between the two constructions is that in the case of the *of*-genitive there is a higher proportion of cases where there is no difference between head and modifier in terms of animacy. While this is an interesting finding, it is not the result predicted by the discourse-functional hypothesis.

	N <sub>head</sub> higher	NP <sub>mod</sub> higher	No difference	Total
s-genitive	0% (0)	90% (45)	10% (5)	100% (50)
of-genitive	2% (1)	50% (25)	48% (24)	100% (50)

Table 2. Results of the corpus analysis Table 2.1 Animacy ( $x^2 = 19.16(2), p < 0.001$ )

*Table 2.2.* Givenness ( $\chi^2 = 16.93$  (2), p < 0.001)

	N <sub>head</sub> higher	NP <sub>mod</sub> higher	No difference	Total
s-genitive	8% (4)	88% (44)	4% (2)	100% (50)
of-genitive	30% (15)	50% (25)	20% (10)	100% (50)

## *Table 2.3.* Length ( $\chi^2 = 1.00$ (2), p > 0.05, n.s.)

	N <sub>head</sub> shorter	NP <sub>mod</sub> shorter	No difference	Total	
s-genitive	34% (17)	56% (28)	10% (5)	100% (50)	
of-genitive	42% (21)	46% (23)	12% (6)	100% (50)	

The findings for givenness are similar. Again the modifier is more given than the head for both constructions. The significant difference between the two constructions is that in the case of the *s*-genitive there is a very clear majority of such cases, while in the case of the *of*-genitive the differences between the three possibilities are much smaller (cf. Altenberg 1980 for similar results). Again, this is an interesting finding, but again, it is not the one predicted by the discourse-functional hypothesis.

Finally, with respect to length there is a trend toward shorter modifiers for both constructions, and the difference between the two constructions is not significant at all.

The discourse-functional hypothesis is clearly disconfirmed by these results: the two constructions are not alternative ways of packaging information flow. However, the results do show that the *s*-genitive strongly prefers highly active modifiers. This preference has been observed before (cf. Brown 1983 and Taylor 1994a), and it makes sense given Langacker's analysis of the *s*-genitive as a reference-point construction: if a referent A is to function as a means of accessing another referent B, it is to be expected that A should be highly active. The fact that the *of*-genitive shows the same preference also makes sense under the reference-point analysis: for the *of*-genitive, it is again the modifier that functions as a reference point. However, the fact that the preference is much weaker also points to the fact that the *of*-genitive is more than just a reference-point construction.

## 5. A semantic account of the two genitives of English

Despite the apparent difficulties, a semantic account of the two genitive constructions is possible if we accept the idea of inheritance with overrides introduced in section two.

Beginning with the s-genitive, note that there are two fundamentally different kinds of examples in Table 1 above. On the one hand, there are those cases where the specific nominals occurring in the construction do not themselves evoke a particular semantic relation: *Kate's shoes* is understood to mean 'the shoes belonging to Kate', but this relation is not inherently specified by the word *Kate* or the word *shoes*. In other words, we can conceptualize Kate without necessarily conceptualizing any of the things she owns, and we can conceptualize a pair of shoes without conceptualizing their owner. On the other hand, there are those cases where one of the nominals *does* evoke a particular relation: *the University's budget* is interpreted to mean 'the budget belonging to the university', but here the word *budget* itself actually inherently specifies a relation of ownership. In other words, we cannot conceptualize a budget without conceptualizing its owner (i.e. the person or group of persons in charge of spending it). Shoes may or may not belong to someone, but a budget that does not belong to anyone is not a budget but simply an amount of money. Slightly extending traditional terminology, I will refer to words like *budget* as *relational* nouns and words like *shoes* as *non-relational* nouns.

Strictly speaking, it is only in the case of non-relational nouns that the *s*-genitive can be claimed to encode a relation of ownership. In the case of relational nouns, there is no way of telling whether it is the *s*-genitive that encodes a relation of ownership or whether it is, for example, the word *budget* that evokes this relation.

Now, note that there are only two relations that can actually be encoded by the s-genitive if the head noun is non-relational: ownership and kinship. If the head noun is inanimate and the modifier animate, the default interpretation is one of ownership, as in *Kate's shoes* above.<sup>4</sup> Where the head noun and the modifier are both animate, the default interpretation is one of kinship: take the examples *your Emily* or *Diane's girl*, which will be interpreted to mean 'your daughter Emily' and 'Diane's daughter' respectively.<sup>5</sup>

Of course, these relations can also be encoded if the head noun is relational, as in the university's budget or Billy's wife. For all other relations, however, the head noun *must* specify the relation that holds between the referents of the two nominals. A COMPONENT-WHOLE relation can only be encoded if the head noun's semantics includes the fact that it is a component of something: the baby's eyes means 'the eyes that are a part of the baby', and the earth's surface means 'the surface that is a part of the earth', but the words eyes and surface already include the COMPONENT-WHOLE relationship as part of their meaning. If a head noun does not specify this relationship, the s-genitive is odd even if a COMPONENT-WHOLE relation is known to exist between the referents of the head and the modifier. It is difficult to come up with an example, because most words that refer to a component of something do specify such a relationship. But take an example like ?? the steel's iron, which is odd because the word iron does not have to be conceptualized as a component of something. In the same context, however, the steel's main component would be fine, because here the head noun does evoke the relevant relationship.

The same argument applies to ATTRIBUTE-HOLDER. This relation can only be encoded by the *s*-genitive if it is inherently specified by the head noun. *Kate's coldness* means 'the coldness that is an attribute of Kate' but the word *coldness* (and all other words referring to attributes) inherently specify the ATTRIBUTE-HOLDER relation, i.e. it is not possible to think of an attribute without the entity of which it is an attribute.

Finally, the same argument can be made for the PARTICIPANT-EVENT relation: event nominals obviously specify their participants as part of their meaning, and thus expressions like *the fire department's investigation* will be interpreted as 'the investigation in which the fire department plays a role'.<sup>6</sup>

To summarize the argument so far, the *s*-genitive encodes possession (i.e. ownership/kinship) when neither of the nominals evokes a particular semantic relation, and it encodes other relations only if those relations are inherently specified by the semantic class of the head noun or by the individual lexical item functioning as the head noun. In addition, as shown in Table 1 above, there are a number of relations that cannot be encoded by the *s*-genitive, namely SUBCATEGORY-CATEGORY, SUBPART-WHOLE, and THING-CONSTITUENT. I will return to this issue at a later point, but first, I will suggest how the facts discussed so far can be naturally accommodated by a Construction Grammar approach.

Essentially, what needs to be accounted for is the fact that the *s*-genitive is interpreted as encoding possession by default, i.e. unless the head noun specifies a different semantic relation. Consider Figure 4, which shows what such an account might look like.



Figure 4. The s-genitive

The analysis follows Langacker (1993, 1995) in assuming that the *s*-genitive encodes a reference-point relation between the modifier and the head, but it differs from this analysis in that, in addition, it assigns the role POSSESSEE to the head noun and the role POSSESSOR to the modifier (the modifier simply encodes the most natural reference point for the head, which in the case of a possessee is a possessor). This construction accounts for the interpretation of *s*-genitives with non-relational nominals, such as *Kate's shoes* and *Diane's girl*, which receive their semantic roles from the construction itself.

The fact that an *s*-genitive with a relational head noun is *not* interpreted as encoding the POSSESSOR-POSSESSEE relation is due to the principle of inheritance with overrides. A relational noun, like any lexical item, is a construction in its own right, and it evokes a semantic frame in which it occupies a particular semantic role, but which in addition includes one or more other participants. Since lexical items (or classes of items) are more specific than unfilled grammatical constructions, the semantic roles specified by a relational noun will override the roles specified by the construction. For example, a noun encoding an attribute, such as *coldness*, assigns the role *attribute* to itself and evokes a frame that includes at least one other participant, namely the holder of the attribute. The reference-point relation encoded by the *s*-genitive picks out this second participant as the most natural reference point, and assigns its semantic role to the modifier. This state of affairs is shown in Figure 5.



Figure 5. The s-genitive of attribute

The of-genitive can be accounted for in a parallel fashion. This requires a well-defined notion of *intrinsic relation*. I will use this term in a very limited way: an intrinsic relation is the relation between an entity and the smaller entities which it consists of or the larger entity which it is a part of. For example, the concept *wall* has an intrinsic relation to the bricks out of which it is built as well as to the building of which it is a part. In other words, an intrinsic relation is the relation between any two contiguous entities in a chain of part-whole relations. Given this definition, the of-genitive can be characterized as a construction encoding a reference-point relation between one entity and another entity which is intrinsically related to the first entity. This analysis can be represented as shown in Figure 6 (*intrinsic entity* here stands for the second entity which is intrinsically related to the first).

This construction accounts for those uses of the *of*-genitive where the nominals themselves do not specify a particular semantic relation: SUBPART-WHOLE and THING-CONSTITUENT, which are simply two different

manifestations of *intrinsic relation*. Beginning with the latter, consider the example *a dress of silk*. Neither *dress* nor *silk* evoke a THING-CONSTITUENT relation, i.e. we can conceptualize a dress without paying any attention to the material of which it consists, and we can conceptualize silk without conceptualizing an entity consisting of silk. It is thus the *of*-genitive itself which provides the meaning THING-CONSTITUENT. Of course, head nouns that do specify this relation as part of their semantics can also occur in the construction, as in *a constellation of stars* or *an array of flowers*.



Figure 6. The of-genitive as a semantic role construction

Turning to the SUBPART-WHOLE relation, note that it often occurs with head nouns that seem to specify this relation: a big chunk of the company means 'the big chunk that is a (sub)part of the company', and the head noun chunk already evokes a relation to some larger entity. Similarly, fifty percent of the population means 'the fifty percent that are a subpart of the population', and again, fifty percent inherently specifies the SUBPART-WHOLE relation as part of its lexical meaning. However, where the head noun does not specify this relation, the construction provides it. Consider examples like a glass of water and a bowl of oranges. Glass and bowl do not inherently specify that they are (sub)parts of a larger entity, but when they occur in the of-genitive, they are interpreted as such: they can be paraphrased as 'the subpart of all water which is contained in the glass' and 'the subpart of all oranges which is contained in the bowl'.<sup>7</sup> I will return below to seemingly relational quantity nouns like chunk and percent and show that even for these, the interpretation as subparts is in part due to the construction.

First, note that relations other than SUBPART-WHOLE or THING-CONSTITUENT can be accounted for in the same way as they were for the *s*genitive. They can only be encoded if the head noun specifies a relation, which then overrides the construction's semantics. This is shown in Figure 7 for the ATTRIBUTE-HOLDER relation, accounting for examples like *the beauty of the desert*.



Figure 7. The of-genitive of attribute

This analysis also explains why the *of*-genitive can encode POSSESSEE-POSSESSOR and INTERPERSONAL RELATION only in some instances, but not in others: *the budget of the university* is possible, since, as noted earlier, *budget* already evokes a relation of ownership and can thus override the semantics of the *of*-genitive. In contrast, *\*the shoes of Kate* is not possible, because *shoes* does not evoke an ownership relation. Therefore, the *of*genitive assigns the semantic relation SUBPART-WHOLE or THING-CONSTITUENT to the expression, neither of which is readily interpretable (and neither of which, of course, expresses the intended relationship of possession).

Two issues remain to be addressed. First, there are some restrictions on the set of semantic relations encoded by the *s*-genitive that I have referred to above, but not yet accounted for. Second, section three pointed out a problem for the prototype analysis that has not been resolved: on the one hand, for both constructions there are semantic relations that cannot be encoded; on the other hand, both constructions can encode a seemingly open-ended set of relations given the right context.

The s-genitive cannot encode SUBPART-WHOLE, SUBCATEGORY-CATEGORY, and THING-CONSTITUENT. For the first two relations, this may seem problematic, since for both of them there are nouns that seemingly specify the respective relation as part of their meaning. For example, *percent* or *chunk* seem to evoke a SUBPART-WHOLE relation, and thus they should be able to encode this relation when they occur in the s-genitive. They should be able to override the construction's semantics just like nouns evoking ATTRIBUTE-HOLDER or PARTICIPANT-EVENT do. However, if these nouns occur in the s-genitive, they do not in fact override its semantics, but actually encode a POSSESSOR-POSSESSEE relation. Expressions like *the population's fifty percent* and *the company's big chunk* are not actually generally unacceptable, they are only unacceptable under a SUBPART-WHOLE interpretation. They are acceptable if the intended interpretation is 'the fifty percent that belong to the population' and 'the big chunk that belongs to the company'. Similarly, nouns like *kind* or *brand* seem to evoke a SUBCATEGORY-CATEGORY relation and should also be able to override the semantics of the *s*-genitive to encode this relation. However, to the extent that they can occur in the *s*-genitive, they encode interpersonal relations, as in examples like *his kind*, *his type*, and *his brand (of people)*, meaning 'the kind of people that are like him'.

The obvious solution to this problem would be to claim that nouns like percent, chunk, kind, and brand are not inherently relational. This would still allow them to be used as terms of quantity in the of-genitive, where the construction adds the SUBPART-WHOLE relation, while it would also account for the fact that they receive a reified interpretation as a possessee in the s-genitive. However, this claim is somewhat counter-intuitive. Instead, I would make the weaker claim that such nouns do not uniquely evoke the SUBPART-WHOLE or SUBCATEGORY-CATEGORY relation in the way that a noun like *beauty* uniquely evokes the ATTRIBUTE-HOLDER relation. Take quantity nouns like *percent* and *chunk*. The difference between the referents of these nouns and those of nouns which actually refer to a component of a larger entity is that the latter are clearly differentiated from the larger entity. The leg of a table, for example, has a certain internal structure that makes it different from other parts of the table. Nouns of quantity, in contrast, do not refer to such a component, but to an arbitrary portion of some larger mass that is not objectively different in any way from other portions of that larger mass. This portion only becomes a subpart by virtue of a conceptualizer who imposes a division onto the undifferentiated mass. This means that nouns like percent or chunk evoke not just a larger entity, but also a person who imposes a division (physically or conceptually) or for whose benefit such a division is imposed. The of-genitive naturally picks out the relation to the larger mass, since this is the one that is compatible with the meaning of the construction. The s-genitive, on the other hand, picks out the relation to the person for whose benefit the division is made. If someone owns fifty percent of something, then those fifty percent become a subpart precisely because they are owned by that someone, i.e. their relation to their owner is the only thing that makes them different from the rest of the entity or mass.

In the case of terms that denote a (sub)category, like *kind* or *sort*, the relation to a larger category that they evoke is also not unique: they evoke, in addition, a relation to their individual members. In other words, a category can be defined by reference to a larger category that includes it, or by reference to the individual entities that it itself includes. The *of*-genitive naturally picks out the relation to a larger category, since this corresponds

to the construction's meaning, while the s-genitive picks out the relation to the individual member (in those cases where this relation is an interpersonal one as in *his kind*).

The last relation to be accounted for is DEPICTION-DEPICTED. This relation can always be encoded by the of-genitive, as in a picture of Lisa, a picture of the table, the footage of the riots. In contrast, it can be encoded by the s-genitive only under certain circumstances, namely when the DEPICTED is a human being and when the picture either serves as a means of identification (They took our pictures) or has special significance to someone close to the DEPICTED (She kept his picture close to her heart). Where this is not the case, the s-genitive is unacceptable (??the table's picture, ??the riots' footage). Assuming that nouns referring to depictions are inherently relational, i.e. that they necessarily evoke the thing they depict, we would expect them to be able to occur in both genitives, overriding their respective semantics. In the case of the of-genitive, this is indeed the case. The question is why the s-genitive does not allow this. I have no final answer, but it seems to me that the fact that the pattern [NP's N<sub>deniction</sub>] has restrictions that are not predictable from the s-genitive or from nouns of depiction is evidence that this pattern is a construction in its own right. This construction, being more specific than the s-genitive, overrides the semantic roles provided by the latter as well as adding semantic content of its own. While the account developed here cannot explain the behavior of nouns of depiction in the s-genitive, it can naturally accommodate it: systematic exceptions to general constructions in the form of more specific constructions are expected.<sup>8</sup>

Finally, let us turn to the issue of the potential open-endedness of the set of relations encoded by the two genitives. This can be accounted for by looking more closely at the difference between relational and non-relational nouns. This distinction is not a binary one, as has been implicitly assumed in the above discussion. Instead, nouns evoke relations to other participants to varying degrees. Some nouns evoke such relations so strongly that they cannot be conceptualized without their relation to other participants, for example (i) nouns referring to attributes, component parts, and events, (ii) kinship terms and many other words from the domain of interpersonal relations, such as *colleague*, *opponent*, etc., as well as (iii) individual lexical items from many semantic domains, e.g., *container*, *assets*, *constellation*, and many others. In contrast, nouns like *shoe* or *glass* do not evoke a relationship to another entity so strongly that they cannot be conceptualized without it, but they weakly evoke a number of such relationships by virtue of our world knowledge about them. It is a salient aspect of our knowledge about shoes that people wear them, and increasingly less salient aspects are that some people have strong feelings about them and that they can be bought on sale, etc. A salient part of our knowledge about trains is that people ride on them to get somewhere, and less salient aspects are that someone services them regularly, that they are driven by someone, etc. Given the right context, any of these relations can be evoked as strongly as if such nouns were true relational nouns, and the relations thus evoked, like Shoe-Wearer, Shoe-Admirer, Train-Passenger, or Train-Engineer, can override the semantics of the construction.

## 6. Information structure revisited

Some of the authors who have analyzed the two genitives as informationstructure constructions implicitly or explicitly recognize that there are semantic relations that can only be encoded by one of the two constructions (e.g., Altenberg 1980; Rosenbach, this volume). These authors often discard those relations from consideration, focusing on (a subset of) the relations for which there is a choice between the two constructions. This is a valid strategy, since of course the question remains as to what determines the choice in such cases. However, this strategy essentially recognizes the fact that the two genitives are primarily semantic-role constructions without providing an explicit account of their semantics. The preceding section has provided such an explicit analysis and explains why some semantic relations can be encoded by both constructions and some cannot. However, it does not account for the choice between the two constructions in those cases where a relation can be encoded by both.

In order to address this issue, I chose a relation that always and unambiguously overrides the semantics of the two genitives, ATTRIBUTE-HOLDER. I extracted 50 examples of each construction encoding this relation from the same corpus used in section three. The same criteria for selection were used. I then coded the examples for the same three parameters as before. The results are shown in Table 3.

Table 3. Information structure for the ATTRIBUTE-HOLDER relation

	N <sub>head</sub> ł	nigher	NP <sub>mod</sub>	higher	No dif	ference	To	otal
s-genitive	12%	(6)	64%	(32)	24%	(12)	100%	(50)
of-genitive	4%	(2)	66%	(33)	30%	(15)	100%	(50)

Table 3.1. Givenness ( $\chi^2 = 2.35$  (2), p > 0.05, n.s.)

	N <sub>head</sub> shorter	NP <sub>mod</sub> shorter	No difference	Total
s-genitive	10% (5)	82% (41)	8% (4)	100% (50)
of-genitive	50% (25)	36% (18)	14% (7)	100% (50)

*Table 3.2.* Length ( $\chi^2 = 23.12$  (2), p < 0.01,\*\*\*)

## *Table 3.3.* Animacy ( $\chi^2 = 84.72$ (2), p < 0.01,\*\*\*)

	NP <sub>mod</sub> animate	NP <sub>mod</sub> inanim	NP <sub>mod</sub> abstract	Total
s-genitive	96% (48)	2% (1)	2% (1)	100% (50)
of-genitive	2% (1)	26% (13)	72% (36)	100% (50)

The results clearly show that givenness is in general not a deciding factor even in choice contexts. The modifier is more given in the majority of instances for both constructions, and the difference between them is not significant.

However, the other two parameters now show the distribution predicted by the discourse-functional hypothesis: in the majority of the cases of the *s*genitive the modifier is shorter than the head, and vice versa for the *of*genitive (although this majority is much smaller in the case of the latter).

More tellingly, the majority of *s*-genitives have animate modifiers while the majority of *of*-genitives have inanimate or abstract modifiers. In fact, the difference between the two constructions with respect to this parameter is near-categorical. A closer look reveals that this difference is in fact also responsible for the distribution of long vs. short modifiers: the average length of all animate nominals in the sample is 2.9 syllables, the average length of all inanimate and abstract nominals is 4.5 syllables. The difference in length thus merely reflects the difference in animacy.

The two constructions thus seem to reflect the general preference of English (and other topic-initial languages) for animate referents to precede inanimate referents where possible (Rosenbach's experimental results confirm this)<sup>9</sup>, moreover this preference is near absolute.

In concluding this section, let me briefly return to the issue of givenness, though. Note that there are three exceptions to the general pattern of animate modifiers occurring with the *s*-genitive and inanimate modifiers occurring in the *of*-genitive: there are two examples of *s*-genitives with inanimate/abstract modifiers, and there is one example of the *of*-genitive with a human modifier. Let us look at these examples in detail, beginning with the *s*-genitive. The relevant examples are shown in (2):

- (2) a. The National PTA believes there are important roles for the federal government to play, as well as state and local education agencies, in ensuring assessment integrity. NAEP's value is in providing national and state trend data ...
  - b. There are two general issues there ... [3 clauses omitted] So the issue there is ... [2 clauses omitted] And the other concern is ... [1 clause omitted] I think of those two concerns ... [9 clauses omitted] The next issue ... [6 clauses omitted] As we move through the report, you can see there is a section on pages 3 and 4. That is the issues' relevance specifically to the grade 8 mathematics test

Both examples would be encoded by the of-genitive if they followed the general animacy preferences: the value of the NAEP (i.e. the 'National Assessment of Educational Progress') and the relevance of the issues. Note that without an accompanying context, these actually sound more natural. However, in both examples, the referent of the modifier is highly active: in (2a) the topic of the discussion is educational assessment, and the NAEP has been mentioned countless times in the preceding discourse; in (2b), the speaker has been talking about the referent of the modifier for twenty-one clauses at the time that the s-genitive occurs. It seems plausible, then, to claim that the violation of the animacy preference in these examples is due to the extremely high activation of the modifier's referents. However, note that there is no general tendency to violate animacy preference with highly active modifiers: there are six cases in the sample where the head is more highly activated than the modifier but that are encoded by the s-genitive anyway, subordinating the given-first principle to the animacy preference of the *s*-genitive.

Turning to the *of*-genitive, a similar argument can be made. Consider the relevant example in (3):

(3) And actually, the composition of the panel ... There are people who have been involved in the NSF initiative curricula writing. There are people who have been involved in writing basal text, algebra. There are people who have worked in systemic initiatives both at state or urban systemic initiatives. That there are people representing the mathematics community. If you look at the backgrounds of the people ... Here, the more natural choice in terms of animacy would be *the people's backgrounds* or *their backgrounds*. However, the referents of *backgrounds* are highly active, since the speaker talks about these backgrounds in the preceding four sentences. Again, it is plausible that the high activation of the head influences the choice of construction here, but again, this is an individual example, not a general principle (note that Standwell 1982 and Osselton 1988 base their claims on the discussion of precisely this type of isolated example).

## 6. Conclusion

The two genitives of English are clearly not information-structure constructions, i.e. their elements are not inherently associated with particular activation states. Instead, they are semantic-role constructions: the *s*-genitive assigns the roles POSSESSEE and POSSESSOR to its head and modifier respectively, and the *of*-genitive assigns roles that I have called, for want of a better term, ENTITY and INTRINSIC ENTITY.

The fact that these two constructions have so often been analyzed as information-structure constructions is due to two facts about their semantics: first, as for other unfilled constructions, the semantic roles they assign can be overridden by those associated with particular semantic classes of words or with individual lexical items occurring in them. Since the two genitives are used to express nothing more than a relation between two participants and since a vast number of nouns evoke specific relations, the meanings of these two constructions are overridden much of the time. This fosters the impression that they do not actually have any meaning at all, which encourages an explanation in terms of information structure. However, the meaning of the two constructions becomes apparent when nonrelational nouns occur in them. Second, the fact that the semantics of the two constructions can be overridden means that they can in many cases encode the same semantic relation. Such cases again encourage an explanation in terms of information structure.

A closer look at one such case has shown that animacy is a strong factor in determining the choice between the two constructions where they encode the same semantic relation: the constructions follow the general preference of English to put animate nouns before inanimate ones. The fact that this preference is virtually absolute, at least with the ATTRIBUTE-HOLDER relation, indicates that it may not be an on-line processing phenomenon, but may actually be grammaticized to a large degree. Givenness was not found to be a decisive factor in this study. This is not to say that it cannot be a factor in individual instances, as the discussion of examples (2) and (3) suggests: it seems that with highly active modifiers speakers sometimes *optionally* choose an *s*-genitive where an *of*-genitive is expected or, with highly active heads, an *of*-genitive where an *s*-genitive is expected. The fact that such choices are optional shows that, at least in the case of the two genitives, the influence of on-line information packaging is heavily limited by semantic factors.

It seems that information structure can influence linguistic structure in two different ways. On the one hand, it can manifest itself in the form of information-structure constructions like the English verb-particle constructions. In such cases, its influence is substantial (though perhaps not exclusive, cf. again Gries, this volume), and language structure will reflect the activation state of referents very directly. On the other hand, information structure can manifest itself as an optional preference in the choice between constructions whose primary difference is to be found elsewhere. In such cases, its influence is extremely tenuous, making it look like a stylistic principle rather than a fundamental cognitive mechanism.

## Notes

- 1. Not all versions of Construction Grammar assume this type of inheritance. However, it follows naturally from the assumption that constructions are abstracted over specific instances in language learning. If a number of structurally similar expressions share a particular semantic property, then their formal and semantic similarities will be abstracted as a more schematic representation and henceforth categorize the more specific instances (e.g., Langacker 1987: 66–71). However, any specific instances which do not fit this more general schema will of course retain their conflicting properties.
- 2. In order to calculate givenness, a hierarchical combination of methods was used: first, a Givón-style text count of (i) number of clauses since the last mention and (ii) number of mentions in the subsequent ten clauses; second, a careful interpretative assessment of which of the two nominals in a given example referred to what the current stretch of discourse was about (if there was a difference between the two nominals in this respect). If the two nominals differed with respect to the first text-count criterion, they were coded according to this criterion. If there was no difference, they were coded according to the interpretative assessment.
- 3. This was determined by checking for each example from the CSPAE whether the 250million-word North-American News Corpus contained at least one example of the opposite construction with the same head noun and a modifier of exactly the same semantic type. Examples with possessive pronouns were ignored, as were fixed expressions (like *Chairman of the Board*), since for both types of case there is no possibility of alternation. Also ignored were immediate verbatim repetitions and tokens in the immediate

vicinity of performance errors, self-corrections etc., since the increased cognitive load associated with these discourse phenomena could presumably interfere with information flow.

- 4. I will return to the fact that, as noted earlier, an expression like *Kate's shoes* can actually refer to any number of semantic relations.
- 5. The examples actually do not necessarily encode a parent-child relationship, they could also encode a relationship between spouses or lovers. However, they cannot encode *any* kind of INTERPERSONAL RELATIONSHIP, say, one between colleagues or acquaintances.
- 6. I will not discuss the difference between subjective and objective genitives here. Typically, both for *s* and *of*-genitives the participant encoded by the modifier could be the Agent or the Patient given the right context. This does not mean that both constructions encode both relations equally frequently, but this does not bear on the issues discussed here (cf. Taylor 1994b for discussion).
- 7. At first glance, this analysis may seem unnecessarily complicated: glass and bowl may be argued to evoke a CONTAINER-CONTAINED relationship, and thus these examples may simply be analyzed as examples of this relation. However, if this were the case, then we should be able to refer to a bowl containing a single orange as \*a bowl of an orange. The fact that this is not possible shows that the word bowl does not evoke a CONTAINER-CONTAINED relation, but instead is assigned the role Subpart by the construction. In a bowl of oranges, oranges refers to an undifferentiated whole from which a bowl can pick out a subpart. In \*a bowl of an orange, the single orange is not conceptualized as an undifferentiated whole, and hence a bowl cannot pick out a subpart.
- 8. Another example of such a more specific construction is the Time-Event relation, which can only be encoded by the s-genitive, as in *last year's Olympics*, or *last night's arrest*. There are two reasons for positing [NP<sub>time</sub>'s N] as a construction in its own right: first, in all other cases it is the head that evokes the relation that overrides the s-genitive's semantics, but here it seems to be the modifier. Second, the construction has heavy restrictions on the kinds of temporal nouns that can occur in it: note the unacceptability of *\*midnight's arrest*, *\*June 25th's explosion*. An example of a more specific construction related to the of-genitive is the one instantiated by expressions like an angel of a woman, where the modifier NP is semantically the head.
- 9. Rosenbach also finds an influence of topicality (i.e. givenness). This discrepancy between her results and mine may be due to the different text types under investigation. Her study is based on a questionnaire giving a minimal context and requiring subjects to choose between the two constructions. This is an off-line task based on written language, and I would assume that the subjects tap into a different kind of knowledge than the speakers in the CSPAE, who are producing spontaneous discourse. A possible explanation is that the subjects in Rosenbach's experiment are influenced by stylistic considerations that reflect knowledge of writing conventions rather than reflecting linguistic processing.

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