

Temporal Adjectives and the Structure of Possessive DPs*

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1 Introduction

In this paper we will discuss an interesting ambiguity found in possessive nominals like (1a) and (1b) containing temporal adjectives:

- (1) a. John's former car b. John's old jacket

We advance three main claims about this ambiguity: (i) it is structural and correlated with syntactic position, (ii) it is problematic for standard semantic analyses of possessive DPs, and (iii) a structure for possessive nominals parallel to that of possessive clauses gives a straightforward account of the ambiguity. We begin with the basic data.

2 Temporal Modification in Nominals

The temporal adjective *former* typically attaches to a noun and creates a predicate true of objects that once had the property described by N. So in (2a), *former* attaches to *movie star* to create a predicate true of people that were once movie stars. In (2b), *former* attaches to *house* to create a predicate true of things that were once houses but are houses no longer. The adjective *old* is similar, but a little more complicated, because it allows a number of additional meanings (3).¹

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¹ *Old IWW member* in (3b) is ambiguous between at least three distinct readings: 'aged IWW member', 'long-time IWW member', and 'former IWW member'. The 'aged/long-time' ambiguity is attributed in Larson (1998) to the presence of an eventuality variable in nouns like *member*; the latter denotes a relation between in-

- (2) a. John met a **former movie star**.
b. That is a **former house**.
- (3) a. This is an **old power station**.
b. Mary is an **old IWW member**.

Consider now the examples in (4) and (5), which show a temporal adjective in a possessive nominal:

- (4) That is **John's former house**.
a. John's & a former(house) N-Modifying Reading
b. former(John's & a house) POSS-Modifying Reading
- (5) This is **John's old car**.
a. John's & old(car) N-Modifying Reading
b. former(John's & a car) POSS-Modifying Reading

The phrase *former house* in (4) can be understood like *former house* in (2b). On this reading *John's former house* refers to an object that John now possesses and that was once formerly a house. Imagine us at the scene of a recent tornado, pointing out the effects of its destruction. We represent this reading schematically in (4a). But (4a) is not the most salient reading of *John's former house*. On its most salient reading, *John's former house* refers to the house that John formerly owned. Perhaps John does not own it any longer. It may not even be a house any longer. But at one time John owned it and it was a house. We represent this reading schematically in (4b). In this paper, we will use the term "N-modifying" to refer to the reading where the adjective modifies just the noun, as in (4a). And will use the term "POSS-modifying" to refer to the reading where the

dividuals *x* (members) and states *e* (states of membership). On the 'aged'-reading, *old* is predicated of *x* (the person is old); on the 'long-time'-reading, *old* is predicated of *e* (the state is old). See Larson (1998,1999) for details. Cf. also Partee (1997) and Taylor (1992).

adjective modifies the possession relation, as in (4b).² Example in (5) shows the same basic ambiguity as (4). *John's old car* can refer to an object that John possesses and that is an old car (N-Mod). *John's old car* can also refer to a car that John formerly owned (POSS-Mod). Note that under the POSS-Modifying reading of (5) there is no need for the car to be old in absolute terms. If John buys a late-model car and sells it, the car becomes his old car even if it is still quite new and in mint condition.

2.1 A Positional Correlate

The N-/POSS-modifying readings show an interesting correlation with position in examples like (6a,b), containing two temporal adjectives:

- (6) a. John's new old car
 b. John's old new car

Notice that (6a) only refers an old car that John has newly come to own. It does not refer to a new car that John used to own. By contrast (6b) has the opposite sense: it refers to a new car that John used to own, not to an old car that John has newly acquired. So in a sequence of two temporal adjectives (A1, A2), the first adjective must be understood as POSS-modifying, and the second as N-modifying:

- (7) **XP's** **A1** **A2** **N**
 POSS-mod N-mod

This suggests that the semantic ambiguity of (6a,b) might be due to a structural ambiguity that we cannot directly observe. Specifically, it suggests that on the POSS-Modifying reading of (6a,b), the adjec-

² Although we concentrate here on temporal modifiers, the N-/POSS-modifying ambiguity is also found with intensional adjectives like *alleged*, *purported* and *putative*, as pointed out to us by Chris Barker. Thus *John's alleged crimes* can refer either to actions by John that are alleged to be crimes (N-modifying), or to crimes that are alleged to be John's (POSS-modifying). Similarly for *John's purported child* and *my putative forgeries*.

tive is in the position of A1, whereas on the N-Modifying reading, the adjective is in the position of A2 (8):

- (8)
- | | | | | | |
|----|-------------|-----------|-----------|----------|--------------------------------------|
| | XP's | A1 | A2 | N | |
| a. | John's | old | | car | "the car John formerly possessed" |
| b. | John's | | old | car | "the car John possesses that is old" |

With no intervening material we would be unable to see the positional difference.

2.2 The N- /POSS-Modifying Ambiguity Elsewhere

Data parallel to those in English are found in other languages as well. Korean examples like (9) show the same ambiguity as English. There is an N-modifying reading and a POSS-modifying reading.

- (9)
- | | | | | |
|----|-----------------|----------|-----|------------------------|
| | John-uy | yeys | cha | |
| | John-POSS | old | car | |
| a. | John's & | old(car) | | N-Modifying Reading |
| b. | former(John's & | a car) | | POSS-Modifying Reading |

Korean also can iterate temporal adjectives, and shows the same correlation between position and interpretation found in English. The examples in (10) are exactly parallel to those in (6). The first adjective is POSS-modifying and the second is N-modifying:

- (10)
- | | | | | |
|----|----------|---|--------------|-----|
| | | POSS-mod | N-mod | |
| a. | John-uy | say | yeys | cha |
| | John-GEN | new | old | car |
| | | 'the old car that John has newly come to own' | | |
| b. | John-uy | yeys | say | cha |
| | John-GEN | old | new | car |
| | | 'the new car that John formerly owned' | | |

This pattern is also seen when Korean temporal adjectives permute with color adjectives like *palan*, 'blue' (11), and quantity predicates like *modun*, 'all' (12):

- (11) a. John-uy palan say cha
 John-POSS blue new car
 'the car of John's that is blue and that is a new model'
 b. John-uy say palan cha
 John-POSS new blue car
 'the car that John has newly come to own and that is blue'
- (12) a. John-uy modun say cha
 John-POSS every new car
 'All of John's new-model cars'
 b. John-uy say modun cha
 John-POSS new every car
 'All of the car's John has newly come to own'

Both adjective orderings are possible. But note that when the color or quantity adjective comes first and *say* is in second position, only an N-Modifying reading is possible. When the temporal adjective comes first, a POSS-Modifying reading is possible.

The N-modifying/POSS-modifying ambiguity is also seen in the Salishian language Halkomelem. Burton (1997) notes that Halkomelem allows the past tense morpheme (*-elh/-alh*) to attach in nominals.³ When it does the result is much like attaching English *former*. When the morpheme affixes in a non-possessive N, the result means 'former N'. When the morpheme affixes in a possessive nominal, it yields the N-modifying/POSS-modifying ambiguity (13):

- (13) a.i. te sqwemá:y ii. te sqwemá:y -elh 'the dead dog'
 the dog the dog-PST
 b.i. tel xeltel ii. tel xeltel-e 'my broken pencil'
 my pencil my pencil-PST or 'my former pencil'
 c.i. tel kopú ii. tel kopú -elh 'my destroyed coat'
 my coat my coat-PST or 'my former coat'

³ We are grateful to Matt Pearson for alerting us to this reference, and the parallels with the English modification data.

3 A Challenge to Compositional Semantics

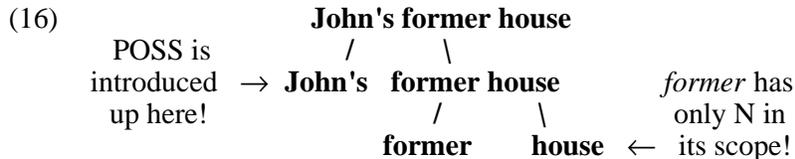
The N- /POSS-modifying ambiguity poses an interesting challenge for compositional semantics. The schematic representations we've given for the ambiguity represent it as a matter of scope. Look back at (4), repeated as (14). On the N-modifying reading only N is in the scope of *former*. On the POSS-modifying reading, possession is in its scope as well.

- (14) That is John's former house.
 a. John's & a **former**(house) N-Modifying Reading
 b. **former**(John's & a house) POSS-Modifying Reading

In typical Montague Grammar analyses, possession is introduced in the interpretation of the genitive determiner. Consider (15) (cf. Barwise & Cooper (1981), Cooper (1983), Engdahl (1986)).

- (15) $John's \Rightarrow \lambda Q \lambda P \exists x \forall y [[[Q(y) \ \& \ \mathbf{POSS}(j,y)] \leftrightarrow y = x] \ \& \ P(x)]$

But this places *POSS* outside the scope of any adjective. Adjectives combine with nouns. The determiner combines with their result. So by the time *John's* is combined, an adjective like *former* has already been put together with N. *POSS* falls outside the semantic scope of *former*, permitting only a N-Modifying reading:



These results suggest that to capture the POSS-Modifying reading we need to extract the interpretation of *POSS* from the interpretation of *John's* and introduce it "lower" in the structure or derivation. There are a number of ways we could do this.

We could allow *POSS* to be added to the meaning of the adjective (so that *former* can optionally mean 'formerly possessed by x'). Rule 1 below pairs adjectives like *former* with counterparts that

contain *POSS*.

Rule 1: If $\delta \in P_{CN/CN}$, then $F_{1001}(\delta) \in P_{CN/CN}$, and $F_{1001}(\delta) = \delta$
Translation: $\lambda P[\delta'(\wedge \lambda y[POSS(x,y) \ \& \ P\{y\}])]$

Alternatively we could allow *POSS* to be incorporated into the meaning of Ns (so that *house* can optionally mean "house possessed by x"). Rule 2 pairs nouns like *house* to counterparts containing *POSS* (cf. Partee & Borschev (1998)):

Rule 2: If $\delta \in P_{CN}$, then $F_{1002}(\delta) \in P_{CN}$, and $F_{1001}(d) = \delta$
Translation: $\lambda y[POSS(x,y) \ \& \ \delta'(y)]$

Neither of these moves is attractive, however. *POSS*-Modifying readings arise specifically in possessive nominals; (4) has a *POSS*-Modifying reading, but (2b) doesn't:

- (4) John's former house
- (2b) That is a former house.

If the A or N can optionally incorporate the *POSS* relation, then why don't we find the ambiguity in simple DPs like *a former house*? The ambiguity seems to involve possessives in particular. These moves lose that connection.⁴

4 Possessive Sentences and Possessive DPs

Temporal modifiers in possessive sentences offer a useful model for thinking about temporal modifiers in possessive nominals. Compare the possessive nominal (4) (repeated below) to the sentential possessives in (17a,b):

⁴ Examples like *A former student (is in your office)* may seem at first a counterexample to the claim that *POSS*-modifying readings require a possessive nominal; this NP can refer to an individual who is currently a student, and where *former* modifies the possession relation. We attribute this reading to the relationality of the noun, which (in effect) licenses an implicit possessive phrase "of X's". *A former student* is analyzed as underlyingly *a former student of X's* and *former* modifies the possession relation. We discuss these constructions in a longer version of this paper in preparation.

5 Temporal Modification Again

Let's return now to the issue of temporal adjectives in possessive DPs. It is not hard to see in an intuitive way that our syntax will offer scopal possibilities similar to that afforded by a sentential possessive. Consider the structures in (23a,b):

- (23) a. [DP John's THE [PP [NP **former** car][P' TO t]]] (N-Mod)
 b. [DP John's THE **former** [PP [NP car][P' TO t]]] (P-Mod)

In (23a) *former* modifies just the nominal (*car*), whereas in (23b) it modifies the entire PP (*a car TO John*).

This intuition can be made precise. Our analysis can be given the straightforward Montague Grammar-style interpretation presented (24)-(26). Without going through the details, we simply draw your attention to lines (27d) and (28d). These show the results for the N-Modifying and POSS-Modifying readings, respectively. Notice that in the first only **car'** is within the scope of **former'**, whereas in the second, **former'** has scope over POSS. These are the interpretations desired.

- (24) a. [P' P DP] \Rightarrow P'(^DP')
 b. [NP N] \Rightarrow N'
 c. [PP NP P'] \Rightarrow λx [NP'(x) & P'(x)]
 d. [D' D PP] \Rightarrow D'(^PP')
 e. [DP *John*] \Rightarrow **j**
 f. [P *TO*] \Rightarrow $\lambda x \lambda y$ [POSS(x,y)]
 g. [N *car*] \Rightarrow **car'**
 h. [D *THE*] \Rightarrow $\lambda Q \lambda P \exists x \forall y [[Q(y) \leftrightarrow y = x] \& P(x)]$
- (25) a. [P' *to John*] \Rightarrow $\lambda x \lambda y$ [POSS(x,y)](**j**) \Rightarrow λy [POSS(**j**,y)]
 b. [NP *car*] \Rightarrow **car**
 c. [PP *car TO John*]
 \Rightarrow $\lambda x [\lambda y [\mathbf{car}'(y)](x) \& \lambda y [\text{POSS}(\mathbf{j},y)](x)]$
 \Rightarrow $\lambda x [\mathbf{car}'(x) \& \text{POSS}(\mathbf{j},x)]$

- d. [D' *THE car TO John*] / [DP *John 's car*]
 $\Rightarrow \lambda Q \lambda P \exists x \forall y [[Q(y) \leftrightarrow y = x] \& P(x)]$
 $(\wedge \lambda x [\mathbf{car}'(x) \& \text{POSS}(\mathbf{j}, x)])$
 $\Rightarrow \lambda P \exists x \forall y [[\mathbf{car}'(y) \& \text{POSS}(\mathbf{j}, y)] \leftrightarrow y = x] \& P(x)]$
- (26) a. *former* \Rightarrow **former'**
b. [XP AP XP] \Rightarrow AP' (^XP')
c. [[**former'**]]^{M,g,w,t} is that function h from $D_{\langle s, \langle e, t \rangle \rangle}$ to $D_{\langle e, t \rangle}$ such that for all $\alpha \in \text{ME}_{\langle s, \langle e, t \rangle \rangle}$ and $x \in \text{Var}_e$, $[[h(\langle w, t \rangle)](\alpha)](x) = 1$ iff $\alpha(\langle w, t \rangle)(x) \neq 1$ and for some $t' < t$, $[\alpha(\langle w, t' \rangle)](x) = 1$ (basically, DW&P (1981), p.164)

The N-modifying reading of *John's former car* :

- (27) a. [NP *car*] \Rightarrow **car'**
b. [NP *former car*] \Rightarrow **former'**(^**car'**)
c. [PP *former car TO John*]
 $\Rightarrow \lambda x [\mathbf{former}'(\wedge \mathbf{car}')(x) \& \lambda y [\text{POSS}(\mathbf{j}, y)](x)]$
 $\Rightarrow \lambda x [\mathbf{former}'(\wedge \mathbf{car}')(x) \& \text{POSS}(\mathbf{j}, x)]$
d. [D' *THE former car TO John*] / [DP *John's former car*] \Rightarrow
 $\lambda P \exists x \forall y [[\mathbf{former}'(\wedge \mathbf{car}')(y) \& \text{POSS}(\mathbf{j}, y)] \leftrightarrow y = x] \& P(x)]$

The P-modifying reading of *John's former car*:

- (28) a. [PP *car TO John*] $\Rightarrow \lambda x [\mathbf{car}'(x) \& \text{POSS}(\mathbf{j}, x)]$
b. [PP *former car to John*] \Rightarrow
former($\wedge \lambda x [\mathbf{car}'(x) \& \text{POSS}(\mathbf{j}, x)]$)
c. [D' *THE former car to John*] / [DP *John's former car*] \Rightarrow
 $\lambda P \exists x \forall y [[\mathbf{former}(\wedge \lambda x [\mathbf{car}'(x) \& \text{POSS}(\mathbf{j}, x)])(y)]$
 $\leftrightarrow y = x] \& P(x)]$

6 More on Possessive Clauses & Possessive Nominals

The analysis of possessive nominals proposed here captures the N-Modifying/P-Modifying ambiguity by creating a strong structural parallel to sentential possessives. The account is further supported by various similarities of behavior between possessive clauses and possessive nominals.

6.1 Constraints on Subjects

Freeze (1992) notes that possessive constructions are sensitive to the [\pm human] value of their possessor subject. Specifically, a [-human] subject of *have* requires the theme to be an "inalienably possessed, or 'characteristically associated' noun (i.e., treated as inalienably possessed)" (p.583). Possessives containing an alienable theme and a [-human] subject are of reduced acceptability. Compare (29a-d), from Freeze (1992). By contrast, Freezes notes that when the subject is [+human], the theme is not limited to these possession types, and may be alienable, inalienable or characteristically associated (30a-c):

- (29) a. The tree has branches. ('inalienable possession')
b. The flour has weevils (in it). ('characteristic association')
c. *The tree has a nest.
d. *The flour has a ring.
- (30) a. The boy has a needle.
b. The boy has a cousin/nose
c. The boy has fleas (on him).

This same pattern of facts appears to hold in the case of possessive nominals, compare (31) and (32):

- (31) a. The tree's branches ('inalienable possession')
b. The flour's weevils ('characteristic association')
c. *The tree's nest
d. *The flour's ring
- (32) a. The boy's needle
b. The boy's cousin/nose
c. The boy's fleas

Assuming this distribution is a grammatical matter, it supports the idea of treating the two classes of possessives in a syntactically parallel way.

6.2 Hungarian Possessors

This analysis also provides an attractive view of certain case alterna-

tions in possessive nominals. English has nominative-marked possessive subjects and a "possessive copula" (*have*) that (according to Freeze) is produced by incorporating a locative P (*to*) into an existential copula (*be*) (33):

- (33) a. Mary has a husband.
 b. [IP **Mary** TO+be [pp t [p' t]]] (*TO+be = have*)
- |_____|

A second, more common pattern is one in which the existential copula appears throughout, and where a locative preposition or oblique case-marking surfaces in the possessive. This pattern is illustrated by the Hindi and Finnish data in (21) and (22). On Freeze's account, the latter derive by raising of the entire P' to IP spec position; no incorporation of P into the copula occurs (34):

- (34) a. Liisa-lla on mies (= (21b))
 Lisa-*adessive* COP(LOC) man
 'Lisa has a husband'
 b. [IP **Liisa-lla** on [pp mies [p' t]]]
- |_____|

Given our analysis, we might expect parallel variation to show up in possessive nominals. That is, we might expect nominals parallel to (33) and nominals parallel to (35). Hungarian, as described by in an interesting series of papers by Szabolsci (1983, 1994), suggests itself as such a case. Szabolsci observes that the subjects of Hungarian possessive nominals may occur without overt case-marking, a situation she diagnoses as involving Nominative case (35a). Alternatively, Hungarian possessors may show up in the dative case (35b). With the nominative possessor, the definite determiner may be absent, whereas with the dative possessor, the definite determiner is required:

- (35) a. Mari kalap-ja-i
 Mari-**NOM** hat-POSS-PL(-3SG)
 Mari's hats'
 b. Mari-nak a kalap-ja-i
 Mari-**DAT** the hat-POSS-PL(-3SG)
 Mari's hats'

Under our analysis, we can view this alternation in terms of the English/Finnish alternation shown above. That is, we can take Hungarian to show in possessive nominals both of the two options noted by Freeze. With the nominative possessors, P incorporates into the definite determiner. The determiner + preposition aggregate (*TO* + *a*) spells out as \emptyset and the subject surfaces in nominative case, as in English sentential possessives. With the dative possessors, no incorporation of P into the definite determiner (*a*) occurs. Thus the latter shows up obligatorily, and the subject surfaces in an oblique case, as with Finnish sentential possessives.⁶

References

- Abney, S. (1987) *The English Noun Phrase in its Sentential Aspect*. Ph.D. dissertation, MIT, Cambridge, MA.
- Barwise, J. and R. Cooper (1981) "Generalized Quantifiers and Natural Language," *Linguistics and Philosophy* 4: 159-200.
- Burton, S. (1997) "Past Tense on Nouns as Death, Destruction and Loss," in K. Kusumoto (ed.) *Proceedings of the North East Linguistic Society 27*, GLSA, University of Massachusetts.
- Cooper, R. (1983) *Quantification and Syntactic Theory*. Dordrecht: D. Reidel.
- Dikken, Marcel. den. 1996. How external is the external argument? Paper presented at WECOL.

⁶ These remarks leave open the case in Hungarian where the possessor is marked nominative and the definite determiner is present, as in *a Mari kalap-ja-i* 'Mari's hats'. Interestingly, in addition to the English and Finnish paradigms, Freeze (1992) identifies a third possibility with sentential possessives. This is the case where the bare location phrase moves to subject position, and where P reanalyzes with the copula, but spells out as *be+P*. Freeze suggests that Portuguese shows both of these possibilities: both have and the possibility of spelling out *be+P* explicitly. A natural possibility that we will not explore here is that the alternation in Hungarian possessive nominals with a nominal subject is parallel to the Portuguese case.

- Dowty, D., R. Wall, and S. Peters (1981) *Introduction to Montague Semantics*. Dordrecht: D. Reidel.
- Filmore, C. (1968) "The case for Case," in E. Bach and R. Harms (eds.) *Universals in Linguistic Theory*. New York: Holt, Rinehart and Winston.
- Freeze, Ray. 1992. Existentials and other locatives. *Language* 68:553-95
- Guéron, J. "On HAVE and BE," In J. Beckman (ed.) *Proceedings of the North East Linguistic Society 25*, GLSA, University of Massachusetts.
- Hoekstra, T. (1994) "Have as BE plus or minus," In G. Cinque et. al. (eds.) *Paths Towards Universal Grammar*. Georgetown: Georgetown University Press.
- Kayne, Richard. 1993. Toward a modular theory of auxiliary selection. *Studia Linguistica* 47: 3-31.
- Larson, R. (1998) "Events and Modification in Nominals," in D. Strolovitch and A. Lawson (eds.) *Proceedings From Semantics and Linguistic Theory (SALT) VIII*. Cornell University, Ithaca, NY.
- Larson, R. (1999) "Semantics of Adjectival Modification," lectures presented at the LOT Winter School, Amsterdam.
- Neale, S. (1990) *Descriptions*. Cambridge, MA: MIT Press.
- Partee, B. (1997) "Uniformity vs. Versatility: The Genitive, a Case Study," appendix to T. Janssen (1997) "Compositionality" in J. van Bentham and A. ter Meulen (eds.) *The Handbook of Logic and Language*, Elsevier.
- Partee, B., and V. Borchev (1998) "Integrating Lexical and Functional Semantics: Genitives, Relational Nouns, and Type-Shifting," in R. Cooper and T. Gamkrelidze (eds.) *Proceedings of the Third Tbilisi Symposium on Language, Logic and Computation*.
- Szabolsci, Anna. (1983) "The Possessor That Ran Away From Home," *The Linguistic Review* 3: 89-102.
- Szabolsci, Anna. (1994) "The Noun Phrase," In I. Kenesei (ed.) *Syntax and Semantics 27: The Syntactic Structure of Hungarian*. New York: Academic Press.
- Taylor, J. (1992) "Old Problems: Adjectives in Cognitive Grammar," *Cognitive Linguistics* 3: 1-35.

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