



English Compounds and Russian Relational Adjectives¹

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English noun-noun compounds are often translated into Russian as relational adjective-noun constructions with the adjective parallel in function to the non-head noun of a compound. However, a large subclass of English compounds which are sometimes referred to as ‘deverbal’ do not have a relational adjective-noun equivalent in Russian. In deverbal compounds (e.g. *van driver*), as opposed to so-called ‘root’ compounds (e.g. *bookstore*), the head noun is derived from a verb and the non-head noun is interpreted as an internal argument of the head noun. In Russian, the same meaning is expressed by means of a genitive construction. It is proposed that this restriction is due to the morphological difference between English compounds and Russian relational adjective-noun constructions. Following Chomsky (1970) and others, nouns derived from transitive verbs may retain the internal arguments of their base verbs. Kayne (1981) shows that internal arguments may only be expressed as DPs and never as APs. Assuming that internal arguments are realized within the lowest maximal projection of their heads (Williams, 1981), adjectives may not express internal arguments because they are adjuncts and as such are realized outside of the lowest maximal projection. Thus, in English deverbal compounds, the non-head member can express an internal argument, whereas it is impossible in Russian since the non-head member of the construction is an adjective.

1 Introduction

English has a productive process of noun-noun compounding by which two nouns are combined to express a certain relation between two entities or ideas denoted by these nouns (Marchand, 1960; Downing, 1977; Selkirk, 1982; Lieber, 1983; Hoeksema 1985; Cinque, 1993 and others). In particular, noun-noun compounds such as *bookstore* constitute a large subclass of English compounds. Such compounds are sometimes referred to as ‘root’ compounds. They are often translated into Russian as relational adjective-noun constructions with the Russian relational adjective parallel in function to the non-head noun in the English noun-noun compound. Such adjectives are called ‘relational’ because they refer to a relation between the entity denoted by the noun they are derived from and the noun they modify (Dudnikov, 1974; Townsend, 1975; Maltzoff, 1985 and others). Thus, both expressions in (1) mean ‘a store that sells books’:

- (1) a. bookstore
 b. knizh-n-yj magazin
 book-ADJ-INFL store
 ‘a/the bookstore’²

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²Since Russian does not have determiners, many Russian examples in this paper can be translated into English as definite or indefinite.

Following Selkirk (1982), I assume that for compounds, the notion of head is defined semantically. For example, *bookstore* designates a store which is somehow related to book or books, e.g. being a place for selling books. It does not designate a book or books which are related to a store. I also assume that the fact that English compounds and Russian relational adjective-noun constructions are often mutually translatable suggests a similarity in their semantic structure. First, both constructions express a relation between two entities. However, this relation is not a part of the lexical meaning of either part of the construction in question. Second, the relation expressed by the construction depends on the lexical meaning of the modified noun. Finally, in both constructions, this relation seems to be arbitrary and the number of possible relations expressed by compounds and relational adjective-noun constructions is potentially unlimited.

English also has noun-noun compounds that sometimes are referred to as ‘deverbal’ (Selkirk, 1982) or ‘synthetic’ (Hoeksema, 1985). In these compounds, the head noun is derived from a verb and the non-head noun is interpreted as an internal argument of the head noun:³

- (2) a. van driver
b. bookseller

English compounds such as in (2) may not be translated into Russian as relational adjective noun constructions. In Russian, this meaning is usually expressed by means of a genitive construction:

- (3) a. voditel’ furgon-a
driver van-GEN
‘a/the van driver’.
b. prodavec knig-Ø
seller book-GEN.PL
‘a/the bookseller’

I propose that this contrast is due to the difference in the morphological structure of the two constructions. In English, two nouns are combined without changing the syntactic category of either of them. In contrast, the formation of Russian relational adjective-noun constructions involves a change of the syntactic category: a noun becomes an adjective. I assume, following Chomsky (1970), Williams (1981), Grimshaw (1990) and others that there is a regular relation between the argument structures of morphologically related words. In particular, nouns derived from transitive verbs may retain the argument structure of their base verbs, including the internal argument. I also assume, following Kayne (1981) that adjectives, unlike essentially synonymous genitive

³According to Selkirk (1982), deverbal compounds are adjective or noun compounds whose head, adjective or noun respectively, is derived from a verb and whose non-head constituent is interpreted as an argument of the head adjective or noun. By *argument* she means an element bearing a thematic relation such as agent, theme, goal, etc. That is, she does not distinguish between a direct internal argument (direct object) and other internal arguments. This approach is problematic for my analysis of English noun-noun compounds and Russian relational adjective-noun constructions. For example, Selkirk lists compounds such as *cake baker* under the same heading with *schoolteacher*. For my purposes, *schoolteacher* differs from *cake baker* in that *school* is not bearing a thematic role assigned to a thematic object – *school* is not a thematic object of the verb *teach*. This is crucial because in Russian, a relational adjective-noun constructions *shkol’nyj uchitel’* ‘schoolteacher’ is possible, whereas *anglijskij uchitel’* ‘English teacher’ meaning a teacher who teaches English, where *English* is a direct object of the verb *teach*, is not. In this paper, I make use of Selkirk’s analysis of deverbal compounds but distinguish between a direct object and other internal arguments. I am using the term *internal argument* to refer to a direct object as opposed to other internal arguments such as theme or goal.

constructions, cannot express a theta-role assigned to an internal argument. Given these assumptions, Russian constructions may not express the head-internal argument relation because the member of the construction which expresses an internal argument is an adjective.

2 Some Relevant Russian Data

2.1 Two types of adjectives

Traditionally, in the Russian linguistic literature, two classes of adjectives are distinguished – relational and qualitative (Dudnikov, 1974; Townsend, 1975; Maltzoff, 1985 and others).⁴ Russian relational adjectives are derived from nouns by means of suffixation and designate a relation between the entity denoted by the noun they are derived from and the entity denoted by the noun they modify. Qualitative adjectives also may be derived from nouns; however, constructions that contain this type of adjectives do not express a relation. Qualitative adjectives attribute a quality to the denotation of the noun they modify:

Relational adjectives:

- (4) a. *igrushech-n-aja fabrika*
 toy-ADJ-INFL factory
 ‘a/the toy factory’
 b. *knizh-n-yj magazin*
 book-ADJ-INFL store
 ‘a/the bookstore’

Qualitative adjectives:

- (5) a. *bol’shoj dom*
 big house
 ‘a/the big house’
 b. *um-n-aja devushka*
 intelligence-ADJ-INFL girl
 ‘a/the smart girl’

In (4), both expressions denote a relation: (4a) refers to a factory that produces toys, whereas (4b) refers to a store that sells books. In (5a), the adjective *bol’shoj* ‘big’ is qualitative in the sense that it attributes a quality to the denotation of the head noun *dom* ‘house’: being big is a quality of a house rather than a relation between a house and something that is big or bigness. In (5b), even though the adjective *umnaja* ‘smart’ is derived from the noun *um* ‘intelligence’ it refers to a quality rather than a relation between *devushka* ‘girl’ and something which is smart or smartness.

The fact that both types of lexical items are adjectives is confirmed by inflectional morphology. The two types of adjectives agree in number, gender and case with the head noun according to the same declensional paradigm:

⁴In fact, sometimes a more fine-grained distinction is made. For example, Vinogradov (1947/1986, pp. 177-8) suggests that all Russian adjectives should be divided into three categories: (i) possessive, (ii) pronominal and (iii) qualitative-relational. The last category should be further divided into three sub-categories: (iii a) qualitative, (iii b) relational and (iii c) derived from active participles. However, since this third category is not extremely relevant for my purposes, I am going to assume the qualitative-relational distinction.

Relational adjective:

- (6) a. Eto igrushech-n-aja fabrika.
 This toy-ADJ-FEM.NOM.SG factory-FEM.NOM.SG
 'This is a toy factory'
- b. V gorode postroili igrushech-n-uju fabrik-u.
 in town PERF-built toy-ADJ-FEM.ACC.SG factory-FEM.ACC.SG
 'In the town was built a toy factory.'

Qualitative adjective:

- (7) a. krasiv-aja devushka
 pretty-FEM.NOM.SG girl-FEM.NOM.SG
 'a/the pretty girl'
- b. Ivan u-videl krasiv-uju devushk-u.
 John PERF-saw pretty-FEM.ACC.SG girl-FEM.ACC.SG
 'John has seen pretty girls'

The distinction between relational and qualitative adjectives also exists in other languages. Examples of English relational adjectives below are from Levi (1978):

- (8) a. presidential interpretation
 b. bacterial infection
 c. biochemical engineer

The adjectives in (8) are derived from nouns by means of suffixation. All three constructions express a relation between the entity denoted by the head noun and the entity denoted by the noun that the adjective is derived from – the expressions in (8) may be interpreted as 'interpretation by a president', 'infection caused by bacteria' and 'engineer working in biochemistry' respectively.

2.2 Semantics: relation versus quality

Although the distinction between relational and qualitative adjectives is primarily semantic, the semantic boundary between these two types of adjectives is vague in part because many relational adjectives may acquire a qualitative meaning (Vinogradov, 1947/1986, pp. 175-8; Dudnikov, 1974; Townsend, 1975; Shvedova, 1980 (I), pp. 542-3 and others). The following examples are from Townsend (1975, p. 210):

- (9) a. serdech-n-aja bolezni'
 heart-ADJ-INFL disease
 'a/the heart disease'
- b. serdech-n-yj chelovek
 heart-ADJ-INFL person
 'a/the cordial, warm hearted person'
- (10) a. knizh-n-yj magazin
 book-ADJ-INFL store
 'a/the bookstore'

- b. knizh-n-yj jazyk
 book-ADJ-INFL language
 ‘a/the bookish language’

In (9) – (10) above, the a-expressions are interpreted as involving a relation, whereas the b-expressions are interpreted as expressing a quality of the modified nouns. The a-expressions clearly involve a reference to the entity denoted by the base noun of an adjective. For example, in (9a), *serdechnaja bolezni* ‘the heart disease’ is a disease of the heart, in (10a), *knizhnyj magazin* ‘the bookstore’ is a store that sells books, etc. In contrast, the b-examples do not involve a direct reference to the entity denoted by the base noun of an adjective. Thus, in (9b), *serdechnyj chelovek* ‘the cordial, warm hearted person’ does not involve a direct reference to a person’s heart. Similarly, in (10b), *knizhnyj jazyk* ‘the bookish language’ does not refer to a language that bears a relation to some books. It refers to a type of language similar to that used in books in general. For example, if we imagine a situation where there are no books left in the world, bookstores probably would disappear but we still would be able to use ‘bookish’ language.

Some adjectives may be ambiguous between a relational and a qualitative reading depending on the noun they modify:

- (11) a. igrushech-n-yj magazin
 toy-ADJ-INFL store
 ‘a/the toy store’
 b. igrushech-n-yj pojezd
 toy-ADJ-INFL train
 ‘a/the toy train’

The expression in (11a) is ambiguous. It may refer to a store that sells toys, in which case this is a relational reading. It also may refer to a store which is a toy, in which case this is a qualitative reading. Intuitively, being a toy is a quality rather than a relation. In contrast, the expression in (11b) does not have a relational interpretation: it only can refer to a train which is a toy.

Since for the purposes of this paper I am interested in the semantics of relational adjective-noun constructions I should define a set of relational adjectives that I will focus on. Despite the fact that the semantic criteria are not always reliable, there are a number of formal properties that distinguish relational and qualitative adjectives. In the next section, I outline some of these formal properties discussed in various sources.

2.3 Formal properties of relational and qualitative adjectives

Relational and qualitative adjectives have different syntactic distribution. For example, qualitative adjectives may be used attributively and predicatively, whereas relational adjectives are normally used only attributively:

- (12) a. umnaja devushka
 smart girl
 ‘a/the smart girl’

- b. Devushka byla umnaja.
 girl was smart
 ‘The girl was smart’⁵
- (13) a. knizh-n-yj magazin
 book-ADJ-INFL store
 ‘a/the bookstore’
- b. *Magazin byl knizh-n-yj.
 store was book-ADJ-INFL
 ‘The store was book’

Levi (1978) discusses English relational adjectives that she calls *nonpredicating* adjectives in the course of developing her theory of complex nominals. She refers to these adjectives as nonpredicating because just like their Russian counterpart, they are normally excluded from the predicate position. However, Levi (1978, pp. 259-260) points out that such adjectives are consistently more acceptable in this position when used in an explicit or implied comparison. Levi’s examples (7.16) and (7.17) are repeated below as (14) and (15):

- (14) a. Our firm’s engineers are all mechanical, not chemical.
 b. ??Our firm’s engineers are all mechanical.
- (15) a. That interpretation of the subpoena is presidential, not judicial.
 b. ??That interpretation of the subpoena is presidential.

The same seems to be true in Russian as well. The expression in (16b) above improves considerably if the relational adjective is used in a comparison:⁶

- (16) magazin byl ne product-ov-yj a knizh-n-yj
 store was neg food-ADJ-INFL but book-ADJ-INFL
 ‘It was a bookstore, not a grocery store.’

If a DP contains one relational and one qualitative adjective, the relational adjective must be adjacent to the head noun. As the examples in (17) show, if this order is reversed, the construction is ungrammatical:

- (17) a. bol’shoj igrushech-n-yj magazin
 big toy-ADJ-INFL store
 ‘a/the big toy store’
- b. *igrushech-n-yj bol’shoj magazin
 toy-ADJ-INFL big store
 ‘a/the toy big store’

⁵Since Russian does not have an overt copula in the present tense, I use the examples in the past tense, for ease of exposition.

⁶I thank Amanda Pounder for pointing this out to me.

Relational and qualitative adjectives may not be conjoined with each other:

- (18) a. *novaja i igrushech-n-aja fabrika
 new and toy-ADJ-INFL factory
 ‘a/the new and toy factory’
 b. *krasivyj i derev-jann-yj dom
 beautiful and wood-ADJ-INFL house
 ‘a/the pretty/beautiful and wooden house’

Gillon (1999, p. 135 (29)) points out the same facts for English:

- (19) a. rich and famous advisor
 b. presidential and senatorial advisor
 c. *rich and presidential advisor

Of course, not only relational and qualitative adjectives may not be conjoined with each other. This restriction on conjunction might reflect more general independent principles and should not be taken as a sufficient condition for being a relational adjective. For example, Vendler (1968) discusses the semantics of adjectives and shows that not all qualitative adjectives may be conjoined with each other:

- (20) a. She is a slow and beautiful dancer.
 b. *She is a blonde and slow dancer. (Vendler, 1968, p. 89 (12) – (13))

The adjectives *blonde* and *slow* describe different qualities: a blonde dancer is a dancer who is blonde, whereas a slow dancer is a dancer who dances slowly. According to Vendler, (20b) can be broken down as follows: *she is a dancer who is blond* and *she is a dancer who dances slow*. Thus, since two different structures are involved the conjunction cannot work (for discussion see Vendler, 1968).

Many qualitative, but not relational adjectives can have short forms that may be used only predicatively and agree only in number and gender with the modified noun (Shaxmatov, 1941, p. 494; Vinogradov, 1947/1986, p. 175; Babby, 1973; Dudnikov, 1974; Townsend, 1975; Siegel, 1976; Maltzoff, 1985 and others):⁷

- (21) a. Ona umn-aja.
 She smart-LONG FORM
 ‘She is smart.’
 b. Ona umn-a.
 She smart-SHORT FORM
 ‘She is smart’

⁷Shvedova (1980 (I), p. 558) notes that in Russian, semantic restrictions on the formation of short forms of adjectives are not very rigid. Therefore, in literature and poetry, relational adjectives may have short forms.

- (22) a. umn-aja devushka
 smart-LONG FORM girl
 ‘a/the smart girl’
 b. *Umn-a devushka.
 smart-SHORT FORM girl (Babby, 1973, p. 349 (1))

While many qualitative adjectives form comparatives, relational adjectives, normally, do not – something can be more or less *rainy* or *tasty* but not more or less *toy* or *book* (Shaxmatov, 1941, p. 494; Vinogradov, 1947/1986, p. 175; Dudnikov, 1974; Townsend, 1975; Gillon, 1999 and others). The expressions with the qualitative adjectives *dozhdlivyj* ‘rainy’ in (23a) or *vkusnyj* ‘tasty’ in (23b) are fine, whereas the expressions with the relational adjectives *knizhnyj* ‘book’ in (24a) or *kirpichnyj* ‘book’ in (24b) is ungrammatical:

- (23) a. Klimat v pustyne meneje dozhdlivyj, chem na poberezh’je.
 climate in desert less rainy than on seacoast
 ‘Climate in a desert is less rainy than that on a seacoast.’
 b. Tim schitajet, chto Pepsi vkusn-eje, chem moloko s maslom.
 Tim thinks that Pepsi tasty-COMP than milk with butter
 ‘Tim thinks that Pepsi is better than milk with butter’
- (24) a. *Etot magazin knizh-n-eje, chem tot.
 this store book-ADJ-COMP than that
 ‘This store is more book than that one.’
 b. *Eta fabrika kirpich-n-eje, chem ta.
 this factory birck-ADJ-COMP than that
 ‘This factory is more brick than that one.’

Also, as shown by ungrammaticality of the expressions in (26) below, qualitative but not relational adjectives may be modified by *very*:

- (25) a. ochen’ vkusnyj tort
 very tasty cake
 ‘a/the very tasty cake’
 b. ochen’ dozhdlivyj den’
 very rainy day
 ‘a/the very rainy day’
- (26) a. *ochen’ knizh-n-yj magazin
 very book-ADJ-INFL store
 ‘a/the very bookstore’
 b. *ochen’ igrushech-n-aja fabrika
 very toy-ADJ-INFL factory
 ‘a/the very toy factory’

Note that not all qualitative adjectives may form comparatives or be modified by *very*. It is possible only with those qualitative adjectives that denote relative and gradable qualities. For

example, adjectives such as *pregnant* denote a quality that is neither relative nor gradable: somebody cannot be more or less pregnant or very pregnant. What is important is the fact that relational adjectives never form comparatives or be modified by *very*.

Gillon (1999) also observes the same formal restrictions on English relational adjectives: they resist comparative and superlative forms and modification by *very*. Note that the examples (27) – (28) are grammatical on a qualitative reading:

- (27) a. *more lunar
b. *more presidential (Gillon, 1999, p. 134 (26.2))

- (28) a. *very lunar
b. *very presidential (Gillon, 1999, p. 134 (27.2))

Relational and qualitative adjectives behave differently with respect to derivational morphology. For example, qualitative but not relational adjectives may form abstract nouns (Townsend, 1975; Shvedova, 1980 (I), p. 541 and others):

- | | | | |
|---------|---------|---|-------------|
| (29) a. | teplyj | > | teplota |
| | ‘warm’ | | ‘warmth’ |
| b. | pustoj | > | pustota |
| | ‘empty’ | | ‘emptiness’ |

These observations suggest that relational and qualitative adjectives are different creatures.⁸ Relational adjectives refer to a relation between two entities – the entity denoted by their base noun and the entity denoted by the noun they modify. In contrast, qualitative adjectives describe qualities of entities in the world. They often denote qualities that are relative and gradable. Although the semantic boundary between the two types of adjectives is often blurry, the formal pattern appears to be quite consistent. For the purposes of this paper, I am going to ignore the qualitative reading of relational adjectives and other ambiguous cases. I consider the Russian constructions with adjectives that have the formal properties of relational adjectives to be the counterpart of English noun-noun compounds.

3 Noun-Noun Compounds and Relational Adjective-Noun Constructions

3.1 Similarity in semantic structure

In this section, I finally turn to the discussion of English noun-noun compounds and Russian relational adjective-noun constructions. I assume that the fact that these two constructions are often mutually translatable might suggest a similarity in their semantic structure. For example, as was mentioned earlier, one of the properties of English compounds and Russian relational adjective-noun constructions is that they are typically interpreted as denoting a relation between two entities – the example (1) is repeated below as (30):

⁸For a more detailed discussion of formal properties of relational and qualitative adjectives and also for more examples of vague cases see Mezhevich (2002) and references there.

- (30) a. bookstore
 b. knizh-n-yj magazin
 book-ADJ-INFL store
 ‘a/the bookstore’

However, a specific relation is not a part of the lexical meaning of either of the parts. In (30), neither the English noun *book* nor the Russian adjective *knizhnyj* ‘book’ suggests that the head nouns *store* and *magazin* ‘store’ respectively should be interpreted as ‘a place that sells books’. In both constructions, the relational meaning of the whole crucially depends on the meaning of the head noun. For example, the expressions in (31) show that in English compounds it is possible to have several different relations with the same modifier but different head nouns:

- (31) a. a fingernail
 b. a finger post
 c. a fingerprint
 d. a finger wave (Marchand, 1960, p. 22)

The expression in (31a) means ‘a nail of the finger’, (31b) means ‘a guide post for bearing a finger index’, (31c) means ‘an impression made by the fingers’ and (31d) means ‘waves produced by the help of the fingers’.

As the examples in (32) demonstrate, Russian relational adjective-noun constructions have the same property. A specific relation expressed by the construction is determined by the meaning of the head noun:

- (32) a. moloch-n-yj magazin
 milk-ADJ-INFL store
 ‘a/the store that sells dairy products’
 b. moloch-n-aja ferma
 milk-ADJ-INFL farm
 ‘a/the farm that produces dairy products’
 c. moloch-n-yj stakan
 milk-ADJ-INFL glass
 ‘a/the glass for milk’⁹
 d. moloch-n-yj koktel
 milk-ADJ-INFL cocktail
 ‘a/the milk cocktail’

The expressions in (32) denote four different relations between the entity denoted by the base noun of the adjective *molochnyj* ‘milk’ and the entity denoted by the head noun: (32a) denotes a relation of selling, (32b) denotes a relation of producing, (32c) denotes a relation of purpose and (32d)

⁹This expression may sound odd to some native speakers, but it is perfectly acceptable, for example, among Russian-speaking religious Jews who observe the Kashrut laws. In accordance with these laws, kitchenware used for dairy and meat products shall be kept separately. In this context, the expression *molochnyj stakan* ‘milk glass’ would refer to a glass that belongs to the dairy set, as opposed to other items that belong to the meat set.

denotes the made-of relation. In every expression, a specific relation emerges from the meaning of both parts and our knowledge of the world, namely, what kind of relation is possible between the two entities involved in the construction.

Finally, as was noted by a number of researchers (Marchand, 1960; Downing, 1977; Selkirk, 1982 and others), the relation expressed by a particular construction seems to be arbitrary and the range of possible relations is potentially unlimited. For example, Marchand (1960, p. 22) suggests that compounds in English are formed when we see or want to establish a connection between two ideas, choosing the shortest possible way. This connection may be very different and often becomes clear from the context only:

- | | | |
|---------|---------------|------------------|
| (33) a. | keyhole | purpose |
| b. | milk cocktail | made-of relation |
| c. | water-nymph | place relation |
| d. | nightclub | time relation |

In (33a), neither the noun *key* nor the noun *hole* have the notion of purpose as a part of their meaning. Nonetheless, this is exactly the meaning of the English compound *keyhole* – a hole for the key. The same is true for Russian relational adjective-noun constructions. Russian adjective constructions also may express relations such as purpose, the material that the thing is made of, place or time relation. The expressions in (34) are translations of the English compounds in (33):

- | | | | |
|---------|-----------------------|-----------|------------------|
| (34) a. | zamoch-n-aja | skvazhina | purpose |
| | lock-ADJ-INFL | hole | |
| | 'a/the keyhole' | | |
| b. | moloch-n-yj | koktel | made-of relation |
| | milk-ADJ-INFL | cocktail | |
| | 'a/the milk cocktail' | | |
| c. | vod-jan-aja | nimfa | place relation |
| | water-ADJ-INFL | nymph | |
| | 'a/the water nymph' | | |
| d. | noch-n-oj | klub | time relation |
| | night-ADJ-INFL | club | |
| | 'a/the nightclub' | | |

Just like in the corresponding English constructions, the relation expressed seems to be arbitrary. For example, in (34a), neither the relational adjective *zamochnaja* 'lock' nor the noun *skvazhina* 'hole' express a relation of purpose. The same is true for other examples in (34). This list of possible relations is by no means exhaustive. For English compounds, as well as for Russian relational adjective-noun constructions, the relation expressed by a particular construction emerges from the meaning of its members and our knowledge of the world. Based on our knowledge of the world we are able to establish a possible relation between the two entities denoted by the parts of the construction in question.¹⁰

¹⁰For an extensive discussion of how English compounds are created and interpreted see Downing (1977).

3.2 What is the difference between *bookstore* and *van driver*?

The so-called ‘deverbal’ or ‘synthetic’ compounds in English do not have a relational adjective-noun equivalent in Russian. The head member in a deverbal compound is a derived noun and the non-head member is interpreted as an argument of the head noun. As opposed to root compounds with non-derived heads discussed in the previous section, the relation expressed by deverbal compounds is not arbitrary. This is the same relation as the one expressed by the base verb of the head noun and its internal argument (Selkirk, 1982; Hoeksema, 1985 and others):

- (35) a. van driver
 b. bookseller
 c. French teacher

The compounds in (35) refer to somebody who drives a van, sells books and teaches French, respectively.¹¹ As the ungrammaticality of the examples in (36) shows, it is impossible to translate English compounds such as in (35) as relational adjective-noun constructions into Russian:

- (36) a. *furgon-n-yj voditel’
 van-ADJ-INFL driver
 ‘a/the van driver’
 b. *knizh-n-yj prodavec
 book-ADJ-INFL seller
 ‘a/the book seller’
 c. #francuz-sk-ij uchitel’
 French teacher
 ‘a/the French teacher’

The expressions in (36a-b) are ungrammatical, while (36c) is only acceptable if it refers to a teacher who is from France. To convey the same meaning, Russian uses genitive constructions:

- (37) a. voditel’ furgon-a
 driver van-GEN
 ‘a/the van driver’
 b. prodavec knig-Ø
 seller book-GEN.PL
 ‘a/the bookseller’
 c. uchitel’ francuz-sk-ogo (jazyk-a)
 teacher French-ADJ-INFL (language-GEN)
 ‘a/the French teacher’

These data suggest that English noun-noun compounds but not Russian relational adjective-noun constructions can express the argument-head relation. In section 4 I show that this contrast may be accounted for in terms of the difference in morphological structure.

¹¹The expression *French teacher* may also refer to a teacher who is from France. In this case, this is not a noun-noun compound but a noun modified by an adjective. I am not considering this reading here.

3.3 A note on Russian compound nouns

It should be mentioned that Russian allows the formation of compound nouns based on coordination, as in (38a) and subordination, as in (38b). In compound nouns, two stems are joined directly or by means of a connecting vowel (*o* or *e*) (Townsend, 1975; Shvedova, 1980 (I), pp. 242-54 and others):

- (38) a. divan – krovat'
couch – bed
'a/the couch-bed'
- b. sneg- o -zaderzhanije
snow- o -retention
'snow retention'

A coordination compound does not express a relation between the two entities but names an object that has properties of both entities denoted by its members. Thus, (38a) refers to an object that has properties of both a couch and a bed. In contrast, a subordination compound expresses some kind of relation: the only way (38b) can be interpreted is 'retention of snow'.

I assume that in Russian, compound nouns (at least compound nouns formed by subordination) are formed morphologically and the formation of such nouns is more restricted than the formation of compounds in English. For example, the compound nouns in (38b) exist in Russian but those in (39) do not:

- (39) a. *avtobus- o -voditel'
bus- o -driver
'a/the bus driver'
- b. *anglij-sk- o -uchitel'
English-ADJ- o -teacher
'a/the English teacher'

In contrast, in English, the formation of compounds is extremely productive. A phrase or a sentence can be a member of a compound, as in (40). Also, there exist compounds where a modifier is a another compound, as in (41):¹²

- (40) a. [do-not-mess-with-me] attitude
b. [God-is-dead] theology
c. [I-am-so-handsome-you-cannot-resist-me] look
- (41) a. bathroom robe
b. [bathroom robe] production
c. [bathroom robe production] crisis
d. [bathroom robe production crisis] committee...

Since the issue of Russian compound nouns does not play a direct role in this paper (except for the fact that because of the limitation on compounding in Russian, speakers often have to use relational

¹² See Hoeksema (1985) for more examples.

adjective-noun constructions where English uses compounds) I am not exploring it here. An extensive discussion of compound nouns in Russian is provided in Shvedova (1980 (I), pp. 242-54).

4 Compounds, Adjectives and Argument Structure

4.1 Theoretical assumptions

Before providing an account for the data outlined above a number of assumptions are necessary. First, I assume, following Chomsky (1970), Williams (1981), Grimshaw (1990) and others, that there is a regular relation between the argument structures of morphologically related words. For example, nouns derived from transitive verbs may retain the argument structure of their base verbs. In particular, nouns derived from verbs by means of the agentive suffix *-er* preserve the internal argument of their base verb:

- (42) a. John drives a van.
b. John is a van driver.

- (43) a. Mary sells books.
b. Mary is a bookseller.

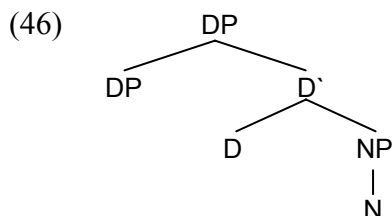
The semantic relation between *driver* and *a van* in (42b) is the same as the semantic relation between the verb *drive* and its internal argument *a van* in (42a). The same is true for (43). Structurally, it can be represented as follows:

- (44) a. drive: $\lambda y \lambda x$ [drive (x, y)]
b. driver: $\lambda y \lambda x$ [driver (x, y)]
c. the van driver: the x: [driver (x) & drive (x, van)]

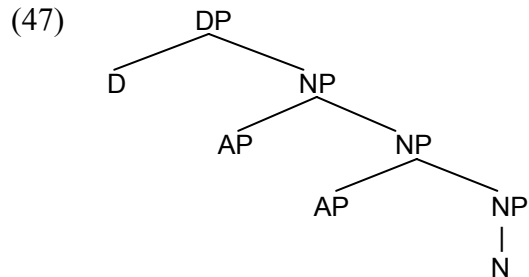
- (45) a. sell: $\lambda y \lambda x$ [sell (x, y)]
b. seller: $\lambda y \lambda x$ [seller (x, y)]
c. the bookseller: the x: [seller (x) & sell (x, books)]

According to (44) – (45), the derived nouns *driver* and *seller* have the same number of arguments as their base verbs and the semantic relation between *driver* and *van* in (44c) and *seller* and *books* in (45c) is the same as the semantic relation between their respective base verbs *drive* and *sell* and their internal arguments.

Furthermore, following Abney (1987), Valois (1996) and others, I assume the DP-hypothesis according to which the lowest maximal projection of N is NP which does not dominate material such as determiner, possessor, etc. According to this analysis, the determiner is the head of the noun phrase and the structure of a DP is as represented in (46) below:



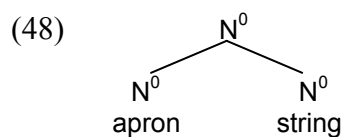
Following Williams (1981), that in D-Structure, all arguments except for the external argument are realized within the maximal projection of their head. This means that internal arguments are complements to the head and are included within the lowest maximal projection of their head. In contrast, modifiers are realized outside the lowest maximal projection, i.e. modifiers are adjuncts which are not included within the lowest maximal projection of the head. I also assume that attributive APs are modifiers, which means they are realized outside the lowest maximal projection. By the lowest maximal projection I mean the lowest phrasal node dominating the head. This gives rise to the following structure:



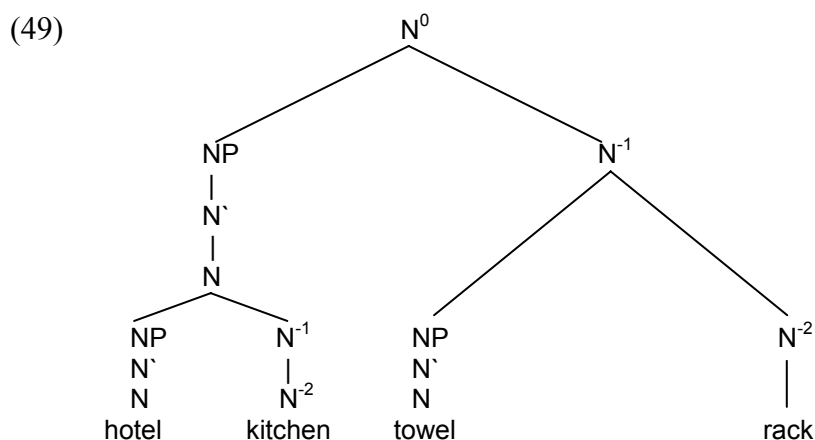
In what follows, I show that given these assumptions, the fact that Russian relational adjective-noun constructions can translate English root compounds but not deverbal compounds is explicable in terms of the argument structure of the head nouns of English compounds and a morphological change involved in the formation of Russian constructions.

4.2 Morphology and Syntax

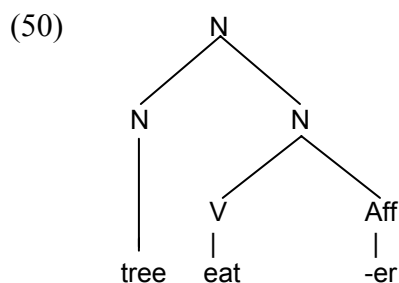
As a starting point, let us again look at English compounds. As was mentioned earlier, given that deverbal nouns may inherit the argument structure of their base verbs the difference between compounds such as *bookstore* and *van driver* lies in the argument structure of their head nouns. According to the assumptions outlined in section 4.1, *van* is an internal argument of the head noun *driver* and as such it must be realized within the lowest maximal projection of the head. Under various analyses of English compounds it is possible. English compounds are often analyzed as instances of N^0 . For example, Selkirk (1982, p. 19) points out that the syntactic definition of head does not work for compounds. Traditionally, in syntactic structure, a constituent C_i is the head of a constituent C_j if it bears the same syntactic category features as C_j , and if its level is one lower than that of C_j . Thus, in the configuration $_{VP}[V VP]_{VP}$, the daughter V is the head because it bears the same syntactic category features as VP and it is one level lower than VP . However, in compounds, the head is of the same level as the parent node and the members of the compound may be of the same category as the parent. Thus, the root compound *apron string* is assigned the following structure:



Similarly, Cinque (1993, p. 278) proposes the following structure for the compound *hotel kitchen towel rack*:



Selkirk (1982) suggests a nontransformational account of deverbal compounds according to which root and deverbal compounds are generated in the lexicon. In other words, compounds such as *van driver* are not derived from corresponding verb phrases, e.g. *drive van* but are created independently. For example, according to Selkirk (1982, pp. 28-9), the compound *tree eater* is ambiguous: it might denote a creature that habitually eats in trees, in which case it is a root compound. It also might denote an eater of trees. Under the latter interpretation, it is a deverbal compound. However, in either case, the structure of this compound would be the one shown in (50):



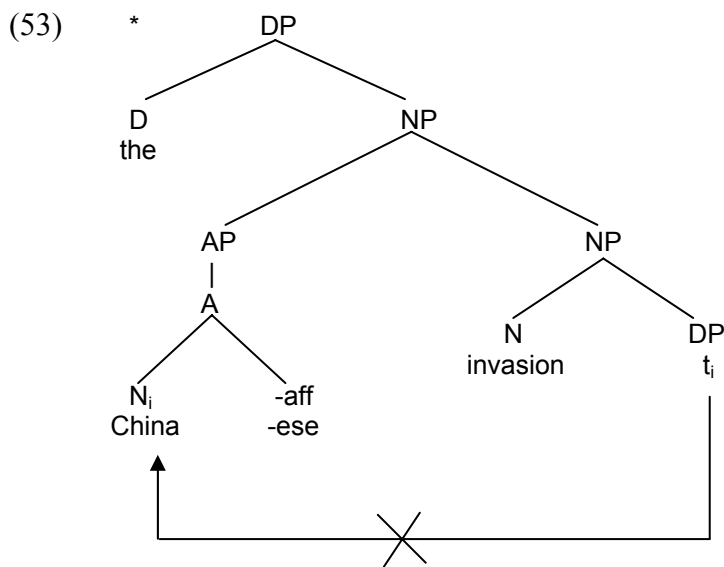
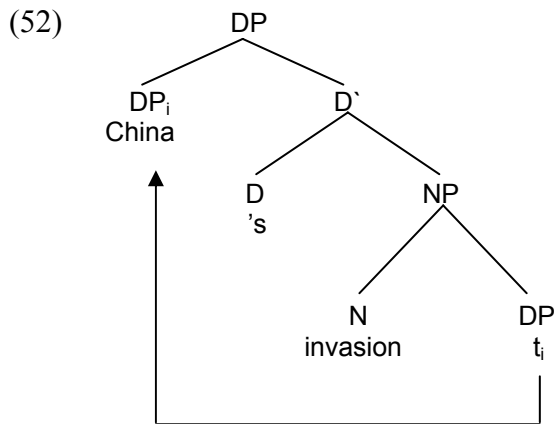
This analysis of English compounds suggests that the non-head noun of a compound is realized within the lowest maximal projection of its head and therefore may express an internal argument.

However, this kind of analysis may not be suggested for Russian constructions. Crucially, the process of formation of Russian relational adjective-noun constructions, as opposed to English noun-noun compounds, involves derivational morphology: the member of the Russian construction parallel in function to the modifier noun in an English compound is an adjective. As Giorgi & Longobardi (1991), following Kayne (1981), point out, adjectives, unlike essentially synonymous genitive constructions, cannot express an internal theta-role assigned to a thematic object:¹³

- (51) a. Everyone deplored Russia's invasion of China.
 b. Everyone deplored China_i's invasion t_i by Russia.
 c. *Everyone deplored the Chinese_i invasion t_i by Russia. (Kayne 1981, p. 111)

¹³I should make clear that Kayne (1981) only briefly addresses this issue in the course of his discussion of ECP extensions. The properties of adjectives – either relational or qualitative – are not the focus of his paper.

In (51c), the internal argument is expressed by an adjective and the sentence is ungrammatical. The contrast between (51b) and (51c) is shown by (52) and (53):¹⁴

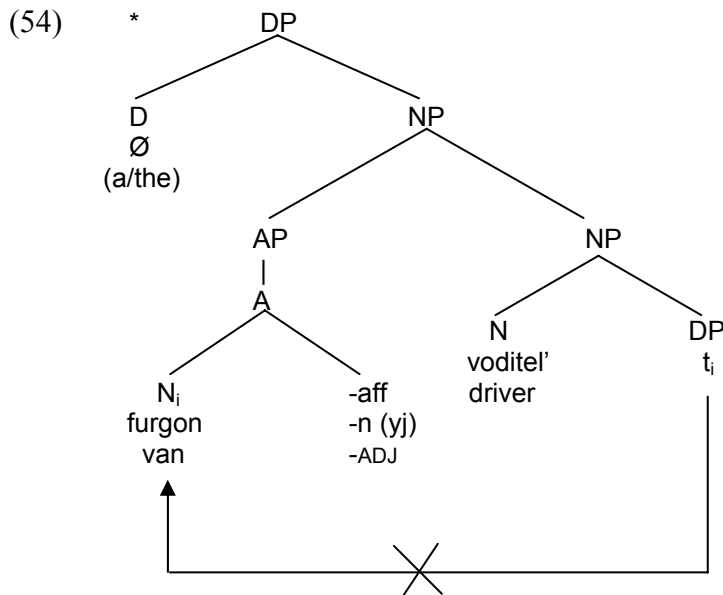


In (52), the internal argument is realized as a DP. It is base generated within the lowest maximal projection of the head and then moves to Spec-DP. However, in (53), the internal argument is expressed by an AP. It is impossible to move a DP into an AP position for a number of reasons. For example, a phrase would have to move into a word position, namely, a DP would move from the internal argument position into an adjective position. Also, according to the Empty Category Principle (ECP), the trace must be c-commanded by its antecedent, which is impossible in (53)

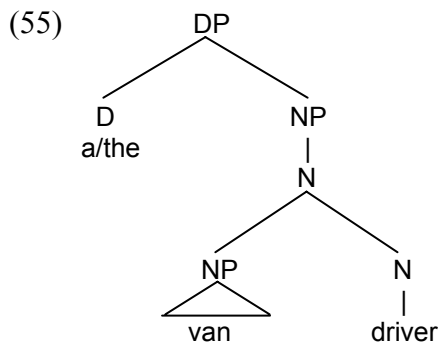
¹⁴Abney (1987, pp. 78-85) discusses various possibilities of the position of 's. In particular, he suggests that 's may be analyzed as a determiner or as a postpositional case marker. Although, as Abney points out, there is little evidence clearly favoring one analysis over the other he prefers 's-as-case-marker analysis based on the fact that historically, 's was a case morpheme and also because in many languages (e.g. Hungarian) lexical determiners may co-occur with possessors. Since nothing in this paper crucially depends on it, I adopt the 's-as-determiner analysis because the other analysis involves a more complicated syntactic structure.

(Chomsky, 1981; 1986). Thus, the structure in (53) may not be derived by movement. Under the assumption that the relational adjective is base-generated in its surface position and there is no movement involved, it is not within the lowest maximal projection dominating the head so it cannot express an internal argument of the head.

The same problem arises with Russian relational adjective-noun constructions such as **furgonnyj voditel'* 'van driver'. Since in Russian, the non-head member is an adjective, relational adjective-noun constructions may not express the internal argument-head relation:



This explains why Russian relational adjective-noun constructions may not be used as a translation of English deverbal compounds. In contrast, in English, there is no morphological change involved, i.e. the process of compounding does not change the category of either noun. Thus, the deverbal compound *van driver* can be assigned the following structure:



Without going into much detail as to what analysis seems to be more preferred – lexical or transformational, under either approach, the non-head member of the compound can express an internal argument of the head. As shown above, under the lexical analysis, the non-head member is a

noun and is base generated within the lowest maximal projection of its head. Under the transformational analysis, the non-head noun is base generated in the internal argument position.¹⁵

5 Conclusion

The data above demonstrate that English compounds and Russian relational adjective-noun constructions have a very similar semantic structure. Both constructions are interpreted as denoting a relation between two entities. In both constructions, a relevant relation for each case is inferred based on the context of use. However, the important difference between the two constructions is that in English, two nouns are combined to express the connection between two entities whereas the process of formation of Russian relational adjective-noun constructions involves a morphological change: a noun becomes an adjective. Although, at first glance, this might seem to be a formal requirement of the language that has nothing to do with the semantics of the expression, this appears to give rise to a number of differences between the two constructions. It is shown that adjectives cannot express a theta-role assigned to an internal argument: assuming the movement analysis, formation of an adjective-noun construction would involve movement of a phrase into a head position (DP into A). On the other hand, assuming that adjectives are base generated in their S-structure position they are not within the lowest maximal projection of the head. As a result, Russian adjective-noun constructions as opposed to English deverbal compounds may not express the head-argument relation. The morphological structure of the two constructions is crucial for the semantic interpretation and morphological change has an effect on what kind of meaning the construction in question may express.

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¹⁵The transformational or syntactic analysis of compounds was proposed in early generative grammar. See Hoeksema (1985, pp. 70-1) for a number of arguments against this analysis.

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