Coordination in morphology and syntax: The case of copulative compounds

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1. Introduction

This article is concerned with coordination in morphology and syntax whereby the main emphasis of the discussion will be placed on coordination in morphology, in particular as it is exemplified in the form of copulative compounds.[1] Descriptive studies of word formation in Germanic generally follow the early grammarians of Sanskrit in classifying compounds according to the major patterns given in (1):

(1)	a.	*computer monitor*	determinative
	b.	*bonehead*	possessive
	c.	*bartender-psychologist*	copulative

Determinative compounds are characterized by a subordinate relation in which the first constituent modifies the second constituent which functions morpho-syntactically and also semantically as the head of the construction: A *computer monitor* denotes a special kind of 'monitor', namely one 'for' a 'computer'. Possessive compounds follow the modifier-head relation of the determinative pattern formally but derive their meaning by extending their semantics to a third entity: *bonehead* doesn't actually designate a 'head of bone' but rather a 'person' possessing a 'head of bone' (i.e. lacking grey matter; a dunce). Copulative compounds, on the other hand, encompass a coordinative relation between the two constituents such that both concepts are predicated equally of the same referent. A *bartender-psychologist*, therefore, refers to someone who is both a 'bartender' and a 'psychologist'. For the major compound patterns, then, the relationship between the constituents of a compound can be either subordinative - as with determinatives (and possessives) - or coordinative - as in the case of copulatives.

This discussion is intended to show that both the determinative and copulative patterns are productive in Present-Day English and can in fact be explained from a theoretical perspective as different semantic options taken on the basis of a general morphological 'template' which characterizes the class of compounds in the lexicon. This view of composition provides important insights into the nature of morphological structure relevant to the theory of grammar: As the theory of syntax has become increasingly abstract over the past years, a number of linguists have attempted to extend the abstract principles of syntax (e.g. case and theta theory, merger, adjunction, head movement, etc.) to the field of morphology as well[2]. It will be argued here that for at least one large and well-studied area of word formation (i.e. composition), morphology must be considered its own field, governed by its own regularities and subject to restrictions that differ in crucial ways from those characterizing syntactic phrases.

2. Coordination in Syntax and Morphology

Copulative compounds by definition display a coordinative relation between their components.

In what sense, then, are copulative compounds similar to or different from related syntactic coordinations? The coordination of referential determiner phrases (DPs) at the syntactic level generally results in plural formation by means of the enumeration of a group of individuals as shown in (2a). Coordination at the morphological level, on the other hand, subserves word formation; it forms a new lexical stem as a means of denoting a single, complex concept, cf. (2b):

(2) a. *The poet and (the) translator were present at the lecture.*
b. *The poet-translator was present at the lecture.*

Upon closer consideration, however, the relationship between syntactic and morphological coordination cannot be this simple. As e.g. Quirk (1985:760ff.), Hoeksema (1987), Lang (1991) and others have pointed out, there apparently exists a close syntactic counterpart to copulative compounds found in so-called "coordinative appositions" such as those shown in (3). The singular verb form in (3a) makes it clear that the coordinated DP in subject position is singular, denoting a single individual. Furthermore, this same coordinative DP can also occur in apposition to a singular head noun as in (3b).

(3) a. *The poet and (the) translator was present at the lecture.*
b. *Austin Thomas, (the) poet and (the) translator, was present at the lecture.*

Such coordinative appositions are obviously related to copulative compounds, but there is a crucial distinction between the two constructions: The predicates used in the creation of a copulative compound join together to form a complex concept to be anchored in our ontological system of individuals. Coordinative appositions, on the other hand, merely assert a number of (possibly distinct) properties about one individual. The essential difference between coordinative appositions on the one hand and morphological copulatives on the other is contrasted in the examples in (4), where we see that it is possible to construe a series of arbitrary predicates as being in apposition to a head noun or within the scope of a single determiner, as in (4a) and (4b), but it is still not possible to conceptualize a new complex entity made up of these same predicates as required by the formation of a copulative compound:

(4) a. *Warhol, the pop artist and (the) instrument of the masses, thrived on irony.*
b. *The pop artist and (the) instrument of the masses thrived on irony.*
c. **The artist-instrument thrived on irony.*

The problem with (4c) is that the concepts 'artist' and 'instrument' cannot unify to pick out a single coherent individual in our ontological system of objects. The denotation of a word, then, is obviously subject to a fundamental cognitive restriction of ontological coherence that doesn't apply to the formation of syntactic phrases. This principle can be formulated as follows:

(5) Principle of Ontological Coherence
A complex concept as the denotation of a morphological object[3] picks out a coherent individual from one of the domains of individuals.

3. The Compound Template

In the view to be proposed in the following discussion, the lexicon provides a formal pattern of compounding conforming to the basic scheme given in (6a): A stem belonging to one of the open word classes of the lexicon may combine with another such stem to form a complex 'headed' stem where the resulting construction takes on the categorial and morphosyntactic features of the head (i.e. the second stem). Recursion is introduced into the scheme if either stem is complex. The semantic counterpart to the formal scheme of (6a) is given in (6b) which basically characterizes the two predicates P and Q that make up a compound as standing in an implicit relation R to one another. Together (6a) and (6b) constitute a template in the lexicon by which novel compounds can be formed.

(6) Compound Template:

a. $[[Y]\,[X]]_X$ where Y, X belong to an open lexical class

b. $\lambda P\,\lambda Q\,\lambda x\,\exists y\;[R(x,y)\;\&\;P(x)\;\&\;Q(y)]$

The theoretical framework I am assuming here is the theory of 'Two-Level Semantics' first developed by Bierwisch (1983) and (1988) and Bierwisch & Lang (1989)[4]. This theory assumes that meaning is best accounted for by adopting two distinct levels of semantic representation. A grammatical level of lexical-semantic representation termed "semantic form" (SF) - formulated in terms of the functor-argument structure of categorial grammar - is strictly compositional in nature and contains only the information necessary for mapping the invariant aspects of meaning directly onto the hierarchical structures of syntax. The decompositional nature of SF as seen in (6b) renders the semantic makeup of linguistic expressions transparent, thereby offering a principled basis for their combinatorial properties. "Conceptual structure" (CS), in contrast, is a more highly articulated level of representation which accommodates the contextually dependent aspects of meaning as well as conceptual inferences that guarantee an appropriate utterance meaning for the expression. As an extra-linguistic, conceptual level of representation, CS not only incorporates the grammatical information encoded in SF but may also draw on further knowledge structures.

The template in (6b) is intended to capture the context-independent, lexical-semantic (i.e. SF) representation of a regular compound. One way of accounting for the context-dependent meaning components present in the CS of the compound is through the instantiation of parameters left open in SF. The underspecified relation R on which the compound template is based is a case in point. It reflects the insights of Dowty (1979), Downing (1977), Günther (1981), Selkirk (1982) and others who have worked on composition and assume that the implicit relation between the two constituents of a compound is grammatically open and basically a function of the compound's use in a particular context. Dowty (1979:316), for example, uses a similar representation for the semantic structure of compounds in which an underspecified variable for the implicit relation is characterized as 'appropriately classificatory'. The variable R of the SF in (6b) has a similar function; it encodes an open parameter in SF that must be instantiated by a specific relation in CS whose content is either predictable from the meaning of the compound's constituents (cf. Fanselow (1981)) or can be inferred from a particularly salient aspect of the context in which the expression is used (cf. e.g. Boase-Beier & Toman (1987) and Meyer-Klabunde (1996)). When applied to the semantic representation of the compound's constituents, the template yields the output representation of the grammatical system - an SF which then must be mapped onto a CS in order to be fully interpretable. The crucial point is that

the grammatical (i.e. SF) representation for both determinative and copulative compounds originates from a single template as formulated in (6).

4. Instantiation of Determinative and Copulative Readings

The formation of a determinative reading for a compound such as *computer monitor* proceeds as follows. The SF template - repeated in (7a) - is applied functionally to the meaning of the head constituent (i.e. 'monitor') and then to the meaning of the nonhead ('computer') which are thereby bound into the formula for the predicate variables P and Q, respectively. Each step of functional application is followed by internal lambda conversion yielding the SF in (7e).

(7) SF of *computer monitor*

a. $\lambda\mathbf{P}\,\lambda Q\,\lambda x\,\exists y\,[R(x,y)\,\&\,\mathbf{P}(x)\,\&\,Q(y)]\,(\lambda u\,[MONITOR(u)])$

b. $\lambda Q\,\lambda x\,\exists y\,[R(x,y)\,\&\,\lambda\mathbf{u}\,[MONITOR(\mathbf{u})](x)\,\&\,Q(y)]$

c. $\lambda\mathbf{Q}\,\lambda x\,\exists y\,[R(x,y)\,\&\,MONITOR(x)\,\&\,\mathbf{Q}(y)]\quad(\lambda w\,[COMPUTER(w)])$

d. $\lambda x\,\exists y\,[R(x,y)\,\&\,MONITOR(x)\,\&\,\lambda\mathbf{w}\,[COMPUTER(\mathbf{w})](y)]$

e. $\lambda x\,\exists y\,[R(x,y)\,\&\,MONITOR(x)\,\&\,COMPUTER(y)]$

This SF represents the invariant meaning of the compound, i.e. the output of the lexical-semantic system of the grammar. In order to account for the actual utterance meaning of the compound, the SF in (7e) must be mapped onto a more explicit conceptual structure (CS) in which the underspecified relation R is given explicit content. One particularly plausible instantiation of R in this case is the 'part-of' relation shown in (8). The CS in (8) thus characterizes the denotation of the compound *computer monitor* as a property of an x, where x is in the extension of the predicate 'monitor' and stands in the 'part-of' relation to an instance of the predicate 'computer'.

(8) CS of *computer monitor*

$\lambda x\,\exists y\,[PART\_OF(x,y)\,\&\,MONITOR(x)\,\&\,COMPUTER(y)]$

As a morphological object, i.e. a word, the compound *computer monitor* denotes a single individual as indicated by the lambda expression λx. The existential quantifier binding the variable y (= $\exists y$) indicates that the first constituent of the compound is not referential. Given the determinative nature of the interpretation, the meaning of the first stem serves to restrict or modify the meaning of the head constituent.

Let us turn now to the case of coordination at the morphological level. In the case of *bartender-psychologist* applying the SF template in (9a) to the meaning of the compound's constituents will derive the SF shown in (9b). This SF - again - allows in principle any salient relation to hold between the head concept 'psychologist' and the nonhead 'bartender'. The compound *bártender psychòlogist*[5] can in principle, then, take on a number of determinative senses along the lines of those given in (10), e.g.: 'a psychologist for a bartender', 'one that treats a bartender', 'one who looks like a bartender' and so on and so forth.

(9) SF *bartender psychologist*

a. $\lambda P\,\lambda Q\,\lambda x\,\exists y\,[R(x,y)\,\&\,P(x)\,\&\,Q(y)]$

b. $\lambda x\,\exists y\,[R(x,y)\,\&\,PSYCHOLOGIST(x)\,\&\,BARTENDER(y)]$

(10) Determinative Senses of *bártender psychòlogist*

a.	R = FOR	psychologist for a bartender
b.	R = TREAT	psychologist that treats a bartender
c.	R = LOOK_LIKE	psychologist who looks like a bartender
d.	....	

Here the advantages of the general template as formulated in (6) become clear: Novel compounds are indeed correctly characterized grammatically by an open relation that in principle allows for a wide variety of possible instantiations depending on the context of use. This justifies the occurrence of the underspecified variable R in the SF of a novel compound which must be instantiated by a specific relation in CS along the lines indicated in (8) and (10).

The question, however, is how the copulative reading of *bártender psychólogist* arises. When the underspecified relation R is instantiated by the identity relation, the result is the reading given in (11a), namely: for a property x, where x is in the extension of the predicate 'psychologist' and an instance y of the predicate 'bartender', x and y refer to the same individual.[6]

(11) Copulative sense of *bártender psychólogist*

a. $\lambda x \exists y$ [=(x,y) & PSYCHOLOGIST(x) & BARTENDER(y)]

b. λx [PSYCHOLOGIST(x) & BARTENDER(x)]

The CS (11a) is equivalent to and hence reduces to the representation in (11b), where a coordination of predicates at the morphological level becomes clear. The result is in accord with the principled cognitive restriction limiting a complex concept underlying a word meaning to the denotation of a single, coherent individual. In (11b) both predicates are predicated of one and the same object x. The Principle of Ontological Coherence (POC) as formulated in (5) guarantees that a complex concept formed in the lexicon as the denotation of possible word denotes an individual that can be anchored in our ontology of individuals. It thus reflects a fundamental insight from psychology stemming from the 1970s (cf. Clark & Clark (1977)) that a complex concept cannot incorporate Boolean conditions in its internal structure such as group formation, disjunction or negation. The POC is thus obeyed by the mapping of the SF in (9b) onto the CS shown in (11b) when the relation chosen is the identity relation.

Interestingly, a principled difference comes to light in this connection between the coordination of two predicates used in the formation of a complex concept as (11b) and coordination at the syntactic level. As Hoeksema (1987:30) notes, coreferential noun phrases cannot be conjoined in syntax, since coordination entails group formation which is not defined in case x = y. Informally spoken: a single individual cannot make up a group.[7]

(12) Restriction on Syntactic Coordination after Hoeksema (1987:30)
"Coreferential NPs cannot be conjoined. The reason is that the group consisting of some individual a, a and a is not defined ..."

In contrast to syntactic coordination, a complex concept constituting the denotation of a word is made up of two or more predicates that do (in fact: must) apply to the same individual. The POC forces the referential variables of the predicates (i.e. x and y in (11a)) to refer to the same individual. Since an inanimate thing cannot be unified with an animate being into a single new

object in our ontological system of objects, the combination **pop artist-instrument* of (4c) is automatically ruled out for principled cognitive reasons, namely as a violation of the POC. The POC is obeyed, on the other hand, in the case of the determinative compound *computer monitor* in (8) since this complex concept refers only to one type of object, namely a 'monitor' of a certain type. The POC being a statement about the possible structure of a complex concept underlying a word meaning has nothing to say, on the other hand, about a series of properties predicated of one individual at the syntactic level such as '*pop artist and instrument of the masses*' in (4a) and (4b).

5. Copulative 'Compounds' in Sanskrit

As mentioned at the outset, copulative 'compounds' played a central role in the grammar of Sanskrit. In Sanskrit, copulatives are marked with either a dual or a plural morpheme and refer accordingly to either a group of two or a group of three or more individuals, cf. Whitney (1962). For example, the construction in (13a) denotes a group of two entities consisting of an elephant and a horse, while the same stem combination in (13b) with a plural marker in place of the dual morpheme on the final stem denotes a group of at least three elephants and horses.

(13) a. *hastyaçv_u*
elephant (*hastin*) + horse (*açva*-dual) 'the elephant and horse'
b. *hastyaçv_s*
elephant (*hastin*) + horse (*açva*-plural) 'elephants and horses'

If we adopt Hoeksema's (1987) view of conjunction as group formation, the denotation of (13a) would be the group indicated in (14a) and (13b) would entail different options, some of which are indicated in (14b):

(14) a. {e, h}
b. $\{e_i, e_j, h\}$, $\{e, h_i, h_j\}$, $\{e_i, e_j, e_k, h\}$ $\{e_i, e_j, e_k, h_i, h_j\}$ ...

Fanselow (1985), in his study of nominal compounds, points out this difference in meaning between copulative 'compounds' in Sanskrit (termed 'dvandvas' in Sanskrit grammar) and equivalent structures in German. Whereas copulatives in Sanskrit consistently denote a dual or plural group of individuals, similarly constructed compounds in German (or, for my purposes here, English) cannot refer to a set of individuals but only to one individual which unifies the two predicates named in the compound. The English example *elephant-horse* in (15a), for instance, carries the meaning represented in (15b) - not that of (14a). I.e. it denotes an animal comprising the properties of both elephants and horses.

(15) a. *elephant-horse*
b. λx [HORSE(x) & ELEPHANT(x)]

Interestingly, copulatives of the form attempted in (16) are not possible in Germanic.

(16) a. **Gore-Lieberman*
b. **Rhine-Main-Danube*

Fanselow attempts an explanation for this by appealing to the type-meaning correlation of Montague grammar. In Montague grammar the logical type of an expression is strictly correlated with the possible meanings the expression can adopt, restricting its possible denotations. Since the basic form of a copulative in German and English is singular, it must correlate with a singular meaning. However, the stems in (16) obviously need to refer to a group of two or three individuals, hence they are not possible. Fanselow notes, however, that there are environments of neutralization where the strict correlation between logical type and meaning is relaxed. One such environment is the front form of a compound as illustrated in (17) where an apparently plural form *Eier* (containing the linking morpheme *-er*) denotes a single individual and an apparently singular form (*Buch*) clearly conveys a meaning of plurality.

(17) a. *Eierschale* 'egg shell'
b. *Buchhandlung* 'book store'

Since front forms of compounds are formally ambiguous with respect to the singular-plural distinction, both the singular and the plural interpretation should be possible and still conform to the type-meaning correlation fundamental to Montague semantics. Fanselow uses this idea to explain why the ill-formed compounds in (16) like **Gore-Lieberman*, which are formally singular and, therefore, cannot stand on their own in a plural meaning, are nevertheless perfectly alright as front forms with a plural meaning as shown in (18).

(18) a. *Gore-Lieberman electors*
b. *Rhine-Main-Danube Channel*

Fanselow states this idea as follows, which I will refer to in the following discussion as 'Fanselow's Prediction':

(19) Fanselow's Prediction (1985:302)
"Where a form such as the front form of a compound does not have a fixed value for some semantically relevant feature such as [± singular], the set of its denotata is the union of the classes of logical types determined by any choice of a value for that feature."

Fanselow's Prediction leads us to expect that we should find the plural formation typical of Sanskrit copulatives in the front forms of complex compounds in English as well. What we actually find, however, is that English copulatives denote a complex concept subject to the POC in accordance with our assumptions up to now, not a group plural. The examples in (18) are not exceptions to this fundamental generalization but simply exemplify a different class of construction: A compound embedded under a head noun will conform to the semantic requirements of the head on which the interpretation of the whole compound depends. This idea will become clearer as soon as we turn to the English data in the next section.

6. Semantic Properties of Copulative Compounds in English

6.1 True Copulatives

Let us look first at unembedded copulative constructions. My corpus contains only a few copulatives denoting things[8]:

(20) *camper-trailer, washer-dryer, bird shelter-feeder, theater-museum, murder-robbery*

By far the most productive semantic pattern designates people by virtue of their professions. These patterns center semantically around business, entertainment, education, journalism, computer science and art, with a small group of other possibilities. Such copulatives can consist of two (*fiddler-guitarist*), three (*listener-viewer-reader*), four (*surgeon-linebacker-artist husband*) and even five (*broker-dealer-investment banker-adviser-owner*) constituents in a coordinative relation, cf. also Olsen (2001).

(21) a. Business:
banker-businessman, managing director-chief financial officer, broker-analyst, broker-dealer-investment banker-adviser-owner, engineer-manager, dealer-manager, partner-lobbyist, director-vice president, company founder-president, farmer-lawmaker, lawyer-negotiator, ranger-naturalist, worker-beneficiary, manufacturer-shipper

b. Entertainment:
filmmaker-playwright, artist-writer-film creator, publisher-executive director, listener-viewer-reader, pop singer-restaurateur, movie star-singer, performer-songwriter, bandleader-arranger, soap star-pop singer, fiddler-guitarist, dancer-aerialist, conductor-witchdoctor, composer-vocalist, actor-vaudevillean

c. Education: *teacher-researchers*[9], *teacher-interpreter, teacher-principal, scholar-educator, scholar-deputy, beggar-students, professor-consultant*

d. Writing: *author-detective, narrator-protagonist, opposition leader-playwright, reporter-narrator, author-philosopher, editor-interpreter, author-chef, author-cartoonist, poet-bard, magazine researcher-reporter, interpreter-translator*

e. Computer Science: *hacker-programmer, reader-users, user-programmer, supervisor-user, customer-user*

f. Art: *painter-pop artist, developer-architect, designer-builder, chief sculptor-engraver, curator-coordinator*

g. Other: *chiropractor-veterinarian, bouncer-doorman, barber-surgeon, mayor-barber, killer-rapist, victim-hero*

Furthermore, a profession is often found together with a kinship term in head position:

(22) Kinship:
(his) engineer-father, college professor mom, (her) surgeon-linebacker-artist husband, (the artist's) business manager-wife, lawyer-brother, dancer-girlfriend

The crucial point to be noted in this connection is that in all these cases of unembedded copulatives, a complex nominal stem establishes the identity of one ontologically coherent individual via the combination of two or more salient concepts used to identify the individual in accord with the compound template in (6b) and the POC in (5).

6.2 Copulatives as Front Forms

Let us look now more closely at the semantic properties of copulatives occurring as front forms of more complex compound stems. In contrast to 'Fanselow's Prediction' in (19), we don't

observe true plural formation in this putatively 'neutral' environment. Instead, the embedded compound conforms to the meaning required by the semantic properties of its head.

For reasons of space, I will limit attention here to the two most productive patterns of data in my corpus. The first group of examples are characterized by a relational head that requires a complex argument whose component parts stand in the 'between' relation to the head. For instance, (23a) can be rendered more explicitly as (23b):

(23) a. *lawyer-client relationship*
b. *relationship between a lawyer and a client*

The examples in (24) all follow this pattern as well.

(24) 'between'
conservative-liberal split, doctor-patient gap, father-daughter relationship, programmer-musician connection, lawyer-client talks, producer-consumer talks, teacher-pupil ratio, worker-employer disputes, worker-employer conflict, supervisor-employee interaction, computer-human interaction, mother-infant bonding, car-pedestrian accident, teacher-student sexual contact, investor-broker case, parent-teacher association, Chrysler-Daimler merger

A wide variety of different heads can be found in this argument position. We find *conservative-liberal split* and *doctor-patient gap* on the one hand, where the notions 'split' and 'gap' denote a cleavage between the component parts of their complex argument - certainly not their union into a group. Furthermore, even concepts like 'talks', 'bonding', 'disputes' denote specific types of interactions between the individual component parts of their complex arguments, not group formation. More abstract heads like 'ratio', 'case' and 'association' can also be found. But even in the case of 'merger' as in *Chrysler-Daimler merger* we are not witnessing genuine group formation of Chrysler and Daimler but rather the fusion of two companies into a new individual. None of these cases, then, can be characterized as group formation via an enumeration of individuals as Fanselow's prediction would lead us to expect. The compounds in front position all fulfill specific argument requirements of the semantic properties of the head on which their interpretation depends. For instance, the lexeme 'gap' denoting an abstract opening between two objects can be assigned a lexical entry along the lines of (25). The two constitutents of the compound front form can be seen to saturate the argument positions y and z of the head at the morphological level:[10]

(25) SF of *gap*
$\lambda z\, \lambda y\, \lambda x$ [OPENING(x) & LOC(x), BETWEEN* (y, z)]]]

A similar situation can be found where collective nouns as heads of the construction embed a compound as a front form. Collective nouns are grammatically singular terms whose meaning entails a collection of other elements. The elements making up the constitution of the collective term can be named by the constituents of the front form. For example, a 'duo' made up of a 'mother' and a 'daughter' is a *mother-daughter duo* and a 'mixture' made up of 'water' and 'alcohol' is a *water-alcohol mixture*.

(26) Collection:
mother-daughter duo, water-alcohol mixture, owner-employee company, dealer-broker firm, a worker-peasant state, teacher-parent council, parent-teacher-principal school management committee, producer-user consortium, copier-scanner-facsimile combination, broker-dealer unit

Since nouns like 'duo' and 'mixture' etc. are not actually relational in a grammatical sense, a conceptual operation must be possible allowing an inference from a term denoting a collection to the elements that constitute the parts of the collection (cf. the ELT function of Jackendoff (1991)). This inference is formalized as a meaning postulate in (27), where the concept 'duo' implies two parts or members y and z.[11]

(27) a. λx [DUO(x)]
b. λx [DUO(x)] $\Rightarrow$ element_of(x, y) & element_of(x, z)

Consequently, embedded compounds such as those in (24) and (26) don't constitute plural formation, but function rather as complex arguments in precisely the interpretation required and, hence, also licensed by the meaning of the head. The head can be relational semantically as in the case of 'gap' in (25) or can allow a conceptual inference from a collection to its constituent parts as in (27). The crucial point is that this type of interpretation is always triggered by a head; such meanings never occur alone.
On the other hand, the meaning that we have isolated for unembedded copulatives - that of a complex concept denoting an ontologically coherent individual - is also possible in embedded environments., cf. (28):

(28) *innatist-selectivist assumption, speaker-hearer competence,* (one-person) *writer-producer companies, computationalist-representationalist position*

An *innatist-selectivist assumption* is an assumption made by an 'innatist-selectivist' (that is, one individual) and *speaker-hearer competence* refers to the 'competence' of a 'speaker-hearer'. Furthermore, ambiguities are possible documenting the reality of the two distinct interpretations: An *educator-scientist commission*, for example, can have both readings in (29):

(29) *educator-scientist commission*
i. commission of educators and scientists
ii. commission of educator-scientists

7. Conclusion

Upon closer inspection then, Fanselow's Prediction doesn't capture the true essence of the problem. The point is not that a particular morphological environment of neutralization releases the restriction against plural formation, enabling the group reading of Sanskrit copulatives to occur in English as well. What is at issue here, rather, is the nature of morphological objects and their possible denotations. As a further piece of evidence against Fanselow's generalization, note that a group meaning is never found in the first constituent of a multi-stem copulative:

(30) *composer-pianist-singer*

The compound in (30) can never be understood as a 'singer' together with a 'composer' and a 'pianist', that is as a collection of three individuals.

The overall result of this study is, then, that copulative compounds in English are genuine morphological structures which instantiate the identity relation shown in (11) resulting in the coordination of two predicates which by virtue of their status as word denotations are subject to the POC. This pattern is found in all unembedded cases and can be shown to occur in embedded positions as well. However, when a compound occurs embedded under certain types of head nouns, it can take on an interpretation conforming to the semantic or conceptual properties of this head. This interpretation is still copulative, i.e. interpretated via a coordination of predicates, but one that isn't subject itself to the POC as long as it is licensed by the semantics of an appropriate head.

Why, then, do the Sanskrit copulatives have the meaning they do? One possible answer might be that they perhaps aren't true morphological structures after all but rather lexicalized remnants of minimal asyndetic syntactic coordinations. It isn't possible for me to go into reasons here why this might be the case.[12] But note that Sanskrit copulatives only occur in non-singular forms; they must be marked with a dual or plural morpheme which points to some type of syntactic origin. If the hypothesis of their basic syntactic nature can indeed be sustained by further study of this phenomenon, their meaning would be explicable: The distinction between the group meaning of copulatives in Sanskrit and the complex concept reading of copulatives in English would then be a direct reflection of the syntactic vs. morphological status of the construction in the two languages.

8. Appendix

The following constructions make up the corpus that served as the empirical basis of this study. Cf. Olsen 2001 for another body of data that complements this corpus in interesting ways.

Unembedded:

(i) BUSINESS

tax assessor-collector, auditor-investigator, limited partner-investors, banker-publisher, banker-businessman, banker-diplomats, managing director-chief financial officer, financier-diplomat, broker-analyst, broker-dealer-investment banker-adviser-owner, programmer-manager, engineer-manager, dealer-manager, manager-bookkeeper, player-manager, administrator-manager-slavedriver, owner-manager, partner-lobbyist, director-officers, director-vice president, officer-boss, owner-chef, company founder-president, founder-president, owner-president, farmer-statesman, farmer-senator, farmer-rancher, farmer-borrowers, farmer-lawmaker, lawyer-rancher, lawyer-agent, lawyer-musicians, lawyer-negotiator, lawyer-novelist, author-lawyer, lawyer-environmentalist, lawyer-detective, lawyer-lobbyist, lawyer-pilot, (her) lawyer-lover, housekeeper-personal assistant, housekeeper-nanny, ranger-naturalist, park ranger-naturalist, worker-beneficiary, manufacturer-shipper, dairy buyer-merchandiser, oil refiner-distributor, motel owner-developers, owner-inventor, grower-members, grower-owners, grower-shipper (of carnations), sponsor-members

(ii) EDUCATION

teacher-entrepreneurs, teacher-researchers, (the school and its) owner-teacher, teacher-interpreter, teacher-coach, teacher-astronaut, teacher-principal, scholar-educator, scholar-priest, scholar-deputy, scholar-athletes, beggar-students, professor-consultant, Marxist philosopher-economist, philosopher-

mechanic

(iii) ENTERTAINMENT

editor-director, publisher-producer, producer-editor, screenwriter-director, composer-politician, creator-producer , owner-producer, filmmaker-playwright, playwright-director, artist-writer-film creator, author-film director, publisher-executive director, listener-viewer-reader, singer-actress, pop singer-restaurateur, movie star-singer, performer-songwriter, singer-composer, pop singer-restaurateur, movie star-singer, performer-songwriter, singer-composer, bandleader-arranger, composer-pianist-singer, entertainer-producer, soap star-pop singer, fiddler-guitarist, dancer-aerialist, conductor-witchdoctor, composer-vocalist, composer/businessman, actor-vaudevillean, restaurateur-entertainer, dancer-defectors, model/actress, movie star-politician, entertainer-businessman, entertainer-businesswoman, listener-victims

(iv) WRITING

author-critic, author-detective, author-reporter, author-lecturer, writer-publicist, narrator-protagonist, opposition leader-playwright, reporter-narrator, philosopher-novelist, author-philosopher, editor-interpreter, editor-publisher, author-historian, author-chefs, author-cooks, author-cartoonist, author-editor, poet-bard, poet-satyrs, poet flacks, reporter-pilot, magazine researcher-reporter, interpreter-translator, street vendor-poet

(v) ART

painter-pop artist, philosopher-painter, poseur-painter, developer-architect, geographer-cartographer, designer-builder, chief sculptor-engraver, curator-coordinator, associate director-chief curator

(vi) COMPUTER SCIENCE

programmer-musicians, hacker-programmer, parser-generator, buyer-user, reader-users, builder-user, user-programmer, user-developers, supervisor-users, customer-user

(vii) MILITARY

payload officer-flight controller, officer-explorer, instructor-navigator, firefighter-engineer, crusader-fighter, bombardier-navigator, soldier-citizens, warrior-priestess, warrior-priest

(viii) OTHER

chiropractor-veterinarian, jeweler-watchmaker, night keeper-watchman, astronomer-physicist, bouncer-doorman, player-coach, firefighter-paramedic, barber-surgeon, multimillionaire novelist, plumber-inmate, owner-cook, preacher-patron, traitor-spy, dicator-president, mayor-barber, count/chicken farmer, arms dealer-wife beater, owner-pilot, killer-rapist, murderer-rapist, executor-murderer

(ix) KINSHIP

(his) mentor-father, engineer-father, filmmaker father, college professor mom, (her) surgeon-linebacker-artist husband, gardener-husband, (the artist's) business manager-wife, lawyer-brother, trader-friend, dancer-girlfriend, (her) painter-lover, lawyer-lover, (one of Bush's professional-)sports hero-buddies

(x) THINGS

sleeper-sofa, kneeler-sitters, clipper-schooner, camper-trailer, washer-dryer, copier-duplicator, video coder-decoders, assembler-disassemblers, refrigerator-freezers, bird shelter-feeder, combination telephone-microcomputer-facsimile-answering machine-alarm clock, theater-museum, dinner-auction, murder-robbery, (find the right) push-pull

Embedded:

(xi) BETWEEN

father-daughter relationship, father-son relationship, lawyer-client relationship, officer-clerk relationships, programmer-musician connection, lawyer-client talks, producer-consumer talks, teacher-pupil ratio, worker-employer disputes, worker-employer conflict, supervisor-employee interaction, computer-human interaction, mother-infant bonding, car-pedestrian accident, teacher-student sexual contact, investor-broker case, word-object associations, conservative-liberal split

(xii) COLLECTION

hotel-apartment complex, mother-daughter duo, city manager-city council system, mayor-commissioner form, water-alcohol mixtures, owner-employee company, dealer-broker firms, a worker-peasant state, teacher-parent councils, parent-teacher-principal, school management committee, producer-user consortium, copier-scanner-facsimile combinations, dinner-theater circuit, broker-dealer unit, Bush-Cheney electors

(xiii) OTHER

liver-intestine transplant, garlic-peanut butter-chocolate candies, shower-locker room, area, sea-air-space museum, mentor-teacher program, broker-deal funds, takeover-buyout mania, copier-fax machine, scatter-gather capability, hunter-gatherer-trader life-style, designer-generator tool, teacher-parent dinners, sitcom/standup show, retailer-wholesaler-manufacturer profit expectations, functor-argument notation, Clinton-Gore campaign-finance squalor, order-build-ship-bill cycle, album-tour-album-tour rat race

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[2] E.g., Baker (1988), Chomsky (1995), Halle & Marantz (1993), Hale & Keyser (1993), Koopman (1995), Lieber (1992), Sproat (1985), Toman (1987) among others.

[3] This notion is to be understood in the sense defined by DiSciullo & Williams (1987).

[4] This theory has been further elaborated by Wunderlich (1991), (1993) and (1997), Wunderlich & Herweg (1991), Herweg & Maienborn (1992), Maienborn (1996), Stiebels (1996), Dölling (1998), Härtl (2001) among others.

[5] For discussion of the differing accent patterns characterizing determinative and copulative compounds cf. Olsen (2000a) and (2000b).

[6] For discussion on this point I thank Claudia Maienborn. Cf. Meyer-Klabunde (1994) for a similar formalization of the copulative relation by means of the identity function.

[7] Partee, ter Meulen & Wall (1990:6) also make it clear that a single individual cannot occur more than once in a given set.

[8] The copulative constructions on which this discussion is based have been compiled from the corpus entitled Tipster Research Collection vol. 1, 1994, annotated by Gerhard Heyer and Uwe Quasthoff at the University of Leipzig. These particular constructions were taken from newswire reports from 1989 and are listed in their entirety in the appendix. For assembling this group of constructions for me I thank Anja Römhild. This study complements that of Olsen (2001) which discusses a similar large base of productive copulatives taken from different sections of the same corpus.

[9] Note that the plural is marked in such forms on the final constituent only (cf. *teacher-researchers, beggar-students, reader-users* etc.) offering further evidence for the lexical status of the copulative formation; the compound structure is a morphological object formed at a level opaque to syntactic plural marking.

[10] The meaning of 'between' is construed in (25) as follows: The constant BETWEEN maps the entities y and z onto an abstract region in relation to which an entity x is then located in the 'between' region of y and z, cf. Wunderlich (1991), (1993), Wunderlich & Herweg (1991) and Habel (1989).

[11] For discussion on this point, I thank Holden Härtl and Andrew McIntyre.

[12] Cf. Olsen (2001) for more discussion of this point.