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An integrated approach to lexicon, syntax, and functions

Zygmunt Frajzyngier
University of Colorado

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Zygmunt Frajzyngier

Abstract

This study demonstrates that lexicons of individual languages reflect some of the functions encoded in their grammatical system. These functions determine the syntactic properties of lexical items. Since the grammatical functions coded across languages vary, so do lexicons in individual languages. This study explains the origin of features of lexical items that affect their syntactic properties. Such features have been noted by others, e.g. Levin and Rappaport-Hovav, 2005 and Ramchand, 2014, but their origin has been left unexplained. The study also raises one fundamental question that remains to be answered: Is there some principle by which some functions encoded in the grammatical system of a language are reflected in the lexicon and other functions are not? The present study considers several hypotheses to answer this question.

The study also explains a long-time question in the theory of lexical semantics, viz. why verbs that refer to the same notions or events, e.g. breaking, hearing, or running, and nouns that refer to the same entities, e.g. the place where one lives, body parts, or water, have different syntactic properties across languages. [2]

Keywords

semantic features, syntactic features, lexical categories, locative, benefactive, indirect object, predication

1 Introduction

1.1 Approaches to the role of the lexicon in syntax

Chomsky (1995) and many scholars to follow, e.g. Levin and Rappaport-Hovav (2005), attribute to the lexicon the fundamental role in syntax involved in argument selection. Neither Chomsky nor other scholars who accept the deterministic role of the lexicon in the formation of phrases and clauses (syntax) explain why the choice of lexical items affects the form of utterances, nor do they explain why the choice of lexical items having the same reference across languages has different effects on the formation of phrases and clauses across languages. Traditional linguistics, starting from Aristotle and up to and including the contemporary minimalist approach, conceives of syntax as a way of forming larger structures from the

lexicon. The meaning of larger units is conceived of as a sum of the meanings of the lexical items used to compose it: 'It is widely assumed, and I will take for granted, that the basic units out of which a sentential concept is constructed are the concepts expressed by words in the sentence—that is, lexical concepts' (Jackendoff 1989/ 2004, p. 324). The generative approaches differ with respect to the role of the lexicon in syntax (for a recent overview, see Fasanella, Gallego and Rubio, 2014). In those descriptions, the notion of event plays a prominent role (Rappaport-Hovav and Levin, 2008, and their other works). To use the notion of the event as a research tool in linguistics one needs a language-independent way of defining the 'event'. Even if such a definition were to be available, and if the nature of the event were to affect the properties of the lexical items that describe it, then one would not expect to find cross-linguistic differences with respect to the lexical items that refer to the same event.

Construction Grammar claims that lexical items acquire their meanings from the frame in which they occur (Goldberg, 1995, p. 125ff). That is an overgeneralization of Wittgenstein's claim that '(f)or a *large* class of cases–though not for all–in which we employ the word "meaning" it can be defined thus: the meaning of a word is its use in the language' (Wittgenstein, 1963, Sect. 43 of *Philosophical Investigations*). Goldberg's claim is based on the properties of a single language: English. Goldberg's approach is illustrated by her analysis of the following example:

(1a) 'He sneezed his tooth right across town.' (Robert Munsch, *Andrew's Loose Tooth*, as quoted in Goldberg, 1995, p. 6)

The structure in example (1) a) implies movement of the object 'tooth' across town. According to Goldberg, the interpretation of 'caused motion' in English is triggered by the phrase 'across town'. The interesting question is why the equivalent of this sentence in Polish is ungrammatical:

Polish

(1b)	**Kichnął*	*ząb*	*przez*	*całe*	*miasto*
	sneeze:PRF:3M:PAST	tooth:ACC	across	whole	town

for 'He sneezed his tooth right across town' or any other meaning

Using the instrumental rather than the accusative case for the noun 'tooth' in the sentence above would result in a grammatical sentence but one that would imply that he sneezed through the tooth rather than he sneezed the tooth:

(1c)	*Kichnął*	*zębem*	*przez*	*całe*	*miasto*
	sneeze:PRF:3M:PAST	tooth:INSTR	across	whole	town

'He sneezed through his tooth right across town'

The reason why the Polish utterance (1b) is ungrammatical and the English sentence (1a) is grammatical is that the two languages code different functions in their grammatical systems. Polish codes the point of view of the subject (Frajzyngier, 1999), i.e. the function that tells the listener to consider how the proposition affects the subject or what happens to the subject but not what the subject does, even if the subject may control the event. For verbs that do not inherently code the point of view of the subject, this function is coded by the short reflexive

marker *się*. Verbs that inherently code the point of view of the subject cannot take an argument marked by the accusative case, because that would imply the point of view of the goal and would result in an internal semantic contradiction within the clause. The verb *kichać* 'sneeze' inherently codes the point of view of the subject, as evidenced by the fact that this verb cannot be followed by the reflexive marker *się*. Since this verb codes the point of view of the subject, it cannot take the object marked by accusative case.

There are two important conclusions from the above discussion: (1) Contrary to Goldberg (1995), the meaning and properties of lexical items are not determined by the environment in which they occur, and (2) lexical items carry functions that are encoded in the grammatical systems of different languages, and the properties of lexical items in different languages are determined accordingly.

Pustejovsky (1991) proposes one of the most complete models for the description of lexical items. This model includes the following components:

1. Argument structure: This is the predicate argument structure for a word, which indicates how it maps to syntactic expressions;
2. Event structure: identification of a particular event type, in the sense of Vendler (1967);
3. Qualia structure: The essential attributes of an object, as defined by the lexical structure;
4. Inheritance structure: How the word is globally related to other concepts of the lexicon (Pustejovsky, 1991, p. 419).

These are all useful pieces of information for making inferences about the properties of individual words in English. They do not, however, provide information about the classes of words that share syntactic properties. Moreover, Pustejovsky does not discuss where the properties of the lexicon, as modeled in Argument structure and Event structure, come from. Since Pustejovsky (1991) is a study of the lexicon in English, he does not consider the question of why lexical items having similar Qualia structure differ cross-linguistically in both Argument structure and Event structure.

1.2 The aim of the present study

The present study rejects the assumptions that the choice of lexical items determines the form of phrases and clauses and that constructions, in the sense of Construction Grammar, impose properties on the lexicon. Instead, the study shows that it is the choice of functions encoded in the grammatical system of the language, and whether the selected lexical items inherently match or do not match these functions, that determines the forms of phrases, clauses, and sentences. The choice of functions encoded in the grammatical system and the properties of lexical items fully explain the apparent cases where the choice of lexical items affects the form of the utterance.

1.3 The main hypothesis of the present study

The main hypothesis of the present study is that lexical items reflect some of the functions encoded in the grammatical system of their languages. The features reflecting these functions are those that determine the syntactic properties of lexical items. Within the proposed approach, the interaction of the lexicon with syntax and morphology has the following form: The speaker chooses to convey some function(s) encoded in the grammatical system of her/his language.

Which construction[3] is selected to convey the function depends on the choice of lexical items to which the function applies. If the lexical item(s) happen to carry the feature matching the chosen function, the least-marked construction is deployed to code the function. If the lexical items do not carry the features matching the function, some morphological or syntactic means must be deployed to ensure that the lexical items do not contradict the chosen function(s) and do not duplicate the information provided by other means.
The rest of this study is composed of the following sections:

(2) Theoretical background and methodology
(3) Hypothesis regarding lexical features
(4) The evidence for the hypothesis
(5) Why some functions and not others are reflected in the lexicon
(6) Towards a more complete description of the lexicon
(7) The diachrony of the features of the lexicon
(8) Explanatory benefits of the approach
(9) Open questions

As can be seen from the above choice of questions, the role of the lexicon in the coding of meaning, or the totality of the relations between the lexicon and syntax, is not in the scope of this study.

2 Theoretical and methodological background

The following theoretical and methodological background is necessary for understanding the analysis of the interaction between lexicon and syntax, the main aim of the present study. In particular, two issues are considered:
(1) What is the meaning encoded in the grammatical system? The answer to this question also provides the answer to the question about the properties of a linguistic form.
(2) How does one discover the meaning of a linguistic form? Much of the philosophical and linguistic literature examines the meaning of a linguistic form through the study of inferences about the real or imagined world, based on an utterance or a collection of utterances. Tarski's (1944) highly influential study took this approach. At least since Austin (1962), philosophical literature has also included the functions of forms in discourse and human interactions. In the discussion that follows I argue that to understand the meaning of any linguistic form, including individual utterances, it is necessary to take into consideration the functions encoded in the grammatical system of the language.

2.1 The meaning of a linguistic form within the proposed approach

The following are fundamental assumptions in this study: The grammatical system of every language encodes a unique semantic structure. At any given time, this structure is composed of a finite number of functional domains. Each functional domain has a finite number of functions. The functional domains and functions encoded differ across languages. Even if languages have similar domains, the internal structure of the domains may differ in the types and number of functions encoded.

At any given time each language has a finite number of formal means of coding, which may include: lexical categories and subcategories; derivational morphology used to change the lexical category of an item or derive a new lexical item; linear orders; use of lexical items to code functions, e.g. serial verb constructions and auxiliaries; use of nouns to code a variety of semantic functions, such as spatial relationships; prepositions and postpositions (often derived from verbs and nouns); phonological means such as pauses, intonations, phrase-final and clause-final markers; inflectional morphology used to indicate relationships with members of the utterance or to directly code elements from semantic structure; repetition of lexical items and phrases; and potentially other formal means. The number and types of coding means cannot be determined at this time, as thousands of languages remain undescribed and many languages have been described with the conceptual apparatus developed in the description of Indo-European languages. The formal means within each language can be combined with each other, creating an even larger number of coding means and thus creating forms to code more functions. The role of the formal means is to (1) code functions that compose the semantic structure of the language, and (2) ensure the principle of functional transparency, i.e. a principle that states that the role of every constituent in the utterance must be transparent to the listener (Frajzyngier, 2004). Lexical categories, linear orders, use of lexical items to code functions, adpositions, and particles are components of what is traditionally called 'syntax'. Within the proposed approach, all the formal means in a language interact in the coding of functions encoded in the grammatical system. The autonomy of syntax as a system of rules for forming large structures, and the process of combining lexical items into larger units as an outcome of lexical properties of the heads, as proposed in Chomsky (1995), cannot be maintained in the proposed approach.

In the process of language use, the speaker chooses to produce functions encoded in her/his language and chooses lexical items that represent the activities and entities that the speaker wants to talk about. The only rules of syntax that exist are the rules that allow the speaker to convey the chosen functions with the chosen lexical items.

Within the proposed approach, the object of semantic investigation is not a sentence, a clause, or an utterance. The main object of semantic investigation is the semantic structure of the language. Much of the past literature on semantics is based on questions about the meaning of a given sentence or a given word in a given language. Moreover, the answers to such questions were usually based on inferences about reality stemming from the analysis of some utterances. These types of questions are essentially irrelevant to the task of describing the semantic structure encoded in the grammatical system. On the other hand, having a list of functions encoded in the grammatical system of a given language will make it easier to answer questions about the meaning of individual utterances. The meaning of individual utterances is the sum of all the functions encoded in the utterance.

The semantic structure of every language needs to be discovered, i.e. linguists need to discover what are the domains encoded in any given language and what are the functions composing every domain. Neither the domains nor the functions are available through speakers' introspections, in the same way in which, just because we are human beings, we cannot describe the functioning of our anatomy, physiological or mental processes. Moreover, the discovery of the meanings encoded in the grammatical system cannot be based on inferences from individual utterances.

2.2 The methodology for the discovery of functions

The methodology for discovering the functions encoded in a language follows the theoretical assumptions stated above, whereby the grammatical system of every language encodes a unique semantic structure composed of a finite number of functional domains. All members of a domain share a single semantic function that is not present in any other domain. For example, all members of the domain 'aspect' share the function of coding the internal structure of an action or an activity, a function not found in any other domain. Within a given domain, each function has a unique feature that is not found in other functions within the same domain. For example, the feature 'imperfective' is not carried by any other function within the domain of aspect. The way to decide whether a language codes a given domain is to compare various forms and discover whether they can or cannot co-occur within a single unit of speech. If they do co-occur, that means that they belong to different domains. If they cannot co-occur, that may mean that (a) they belong to the same domain and code different functions within that domain, or (b) they belong to different domains and in one way or another they contradict each other. The content of a function is thus determined by (a) what the function shares with other functions within the same domain, and (b) the difference between the given function and other functions within the same domain. Inferences about functions that are based on reality or imagined reality play no role in the discovery of the meaning of the form. In what follows, I illustrate the analytical methodology on the locative predication in Mina (Central Chadic). The analysis shows that the presence of locative expressions in a language does not mean that the language codes the function of locative predication, and it also shows how the presence of a function in the grammatical system affects the properties of lexical items.

2.3 Locative predication in Mina

The basic question starts with the restrictions on the co-occurrence of certain forms in Mina: for example, why there is no locative preposition in example (2) a and b but there is a preposition in example (2) c. A related question is why there are prepositions in the English translations of both (2) a. b and (2) c: (all data from Frajzyngier, Johnston with Edwards, 2005):

Mina

(2a) *ábə̀ nd-á ngə̀n wùtá*
ASSC go-GOAL 3SG village
'Then she returned **to** her village.'

(2b) *séy mə̀ ngùl ngùl tìy á tìy-ù*
so REL husband see 3SG see-3SG
*wàl tsú zə́ **dámù***
wife went EE bush
'So the husband saw that his wife went into the bush.' (EE: end-of-event marker)

(2c)	*mìnjée*	*mbə̀*	*mə̀*	*mármàr*	*ká*	*nàz-á*
	now	boy	REL	pasture	INF	abandon-GOAL
	kw-yîì	*zə́*	***nə̀***	***láy***		
	goat-PL	EE	PREP	field		

'Now the shepherd left the goats in the field.' (Frajzyngier, Johnston with Edwards, 2005)

The presence of a preposition in English and its absence in one example in Mina cannot be used to claim that Mina has no prepositions, because a preposition does occur in Mina in example (2).

Another question concerns the presence of the marker *á* in the following examples from Mina. The question is why examples (3) and (4) have the marker *á* while examples (2a-b) and (2) c. do not. Note also that the English translations do not have a similar marker and, moreover, that the English versions have two different prepositions, namely 'into' and 'on', before the locative complements 'room' and 'ground':

(3)	*nd-á*	*yà*	*ngùl*	*ngə̀n*	***á***	*bìŋ*
	go-GOAL	call	husband	3SG	PRED	room

'And [she] called her husband into the room.'

(4)	*ŋ̀kwə̀*	*tə́*	*lə̀véŋ*	*hì*	*ká*	*skə̀m-á*	*zà*
	goat	GEN	black	2PL	INF	buy-GOAL	EE
	hì	*fə̀t*	*kà*	***á***	*káyàk*		
	2PL	skin	POS	**PRED**	ground		

'A black goat, when you have bought it, you skin it on the ground.'

There are three arguments against the potential claim that the marker *á* is a preposition. The first argument is that its presence is fully dependent on the nature of the predicate: If the predicate is inherently locative, the marker *á* does not occur. The second argument is that the marker *á* does not code the role of the noun phrase. The third argument is that the form *á* can cooccur with the locative preposition in the language.

The marker *á* occurs with both inherently locative and inherently non-locative complements (examples 3, 4, 7), hence its presence does not depend on the features of the complements. The marker *á* occurs after the verbs *yà* 'call' (example 3), *fə̀t* 'skin' (example 4) and *tə́wə̀r* 'suffer' (example 7). These verbs have no semantic feature in common. On the other hand, the marker *á* does not occur after the verbs *nd-á* 'go to' (ex. 1a), *tsú* 'went' (ex. 1b), and *nàz-á* 'abandon, leave'. These verbs do have something in common, as they all indicate movement and directionality. The marker *á* also occurs in locative expressions when no predicate is present:

(5)	*kwáyàŋ*	*zá*	*ɮì*	*mə̀*	*mə̀ts-yí*
	squirrel	COMP	meat/animal	REL	die-STAT
	bàytáŋ	***á***	*dámù*		
	large	**PRED**	bush		

'The squirrel said, "There are a lot of dead animals in the bush."'

The marker *á* also occurs when the predicate is the verb 'exist' but the intent of the speaker is to produce a locative predication with a locative complement:

(6) *háɮàm dǎhá* **á** *bìŋ ngàn*
daughter exist **PRED** house 3SG
'There is a girl at her house.'

We may conclude now that the marker *á* is in complementary distribution with verbs having the feature [locative]: If the verb is inherently locative (and all directional verbs are), the marker *á* does not occur in the locative predication. If the verb is inherently non-locative and the intended predication is locative, the marker *á* codes the predication as locative.

The second argument involves the use of the preposition *nà*. The preposition *nà* is used when the complement is inherently non-locative and is not used when the complement is inherently locative. Note that in example (7) the preposition *nà* occurs before the third-person plural pronoun, a non-locative constituent that is preceded by the spatial specifier *fálà* 'among':

(7) *hà táŋ təwàr* ***á*** ***nà*** *fálà tàtàŋ*
2SG DED suffer PRED PREP among 3PL
'You suffer [a lot] among them.'

The presence of the marker *á* before the preposition *nà* constitutes the second argument that the marker *á* is not a preposition. The sole function of *nà* is to code the following complement as locative, without any indication of spatial relationship or directionality.

As shown in example (2c) above, the preposition *nà* can also occur before the noun *láy* 'field'. The evidence that the noun *láy* 'field' is a non-locative noun is provided by the fact that in Mina it is treated as an entity, in that it can be bought and sold. When the noun *láy* 'field' is a syntactic object the end-of-event marker *zà* occurs after the noun rather than before it, as would have been the case before the locative complement:

(8) *guzak naŋ kə vl-a-k lay za*
uncle 1SG INF give-OBJ-1SG field EE
'My uncle gave me a field.' (written sources, hence no tonal notation)

Note also that the preposition *nà* does not occur before nouns that are inherently locative, such as *dámù* 'bush, outdoors' (example 1), *bìŋ* 'room' (example 3), and *káyàk* 'ground' (example 4). The properties of the preposition *nà*, as illustrated above, are not idiosyncratic features of judiciously selected examples but are supported by all the relevant data in Mina. Hence, the function of the preposition *nà* is to mark the locative function of a complement that is inherently non-locative. The function of the preposition *nà* is thus quite different from the functions of prepositions in English, whose presence does not depend in any way on the inherent feature [locative] in the complement. And the most important conclusion from the above discussion: Some nouns in Mina are inherently locative and others are not, and whether they are or are not inherently locative makes a difference in the formation of locative complements in the language. In English, whether a noun is inherently locative or not makes no difference in the formation of locative complements. In other words, the semantic structure of English does not include the locative predication, and consequently the language does not

distinguish between classes of inherently locative nouns and non-locative nouns. The nouns 'home' and 'south' in expressions of the type 'go home', 'go south', etc. represent adverbs of manner rather than locative complements, as evidenced by the fact that they cannot be modified by other locative complements, e.g. '*go home over there', etc.

The grammatical system of Mina thus includes the function of locative predication, which is distinct from all other predications. Consequently, some verbs and nouns in Mina carry the feature [+locative] while others do not. If the verb is not inherently locative, the locative predication must be marked by the locative predicator *á*. If the complement is not inherently locative, the noun must be marked for the locative complement function by the preposition *nə̀*. If neither the predicate nor the complement is inherently locative, both the predicator *á* and the preposition *nə̀* must be deployed in the locative predication.

The methodology illustrated in the analysis of the locative predication in Mina is applied below to other functions that are encoded in the grammatical systems of various languages. The methodology is used to discover features of the grammatical systems that are reflected in the properties of lexical items.

2.4 Locative versus non-locative features

If a language codes locative predication in its grammatical system, one should expect that some verbs and/or some nouns have the inherent feature [+locative] and other verbs and nouns do not have this feature. In a language that does not code the function [locative] in its grammatical system, lexical items do not carry the semantic feature [±locative] in such a way that it would affect the form of the utterance. There are several interesting variants of how the locative predication is encoded in the grammatical system and consequently there are various ways of how the locative predication is reflected in the lexicon.

In some languages, a distinction is made between inherently locative predicates and inherently locative complements, as opposed to all other types of predicates and all other types of complements, as described for Mina and illustrated in section 2.1.

Traces of a locative predication appear in the grammatical system of Lele (East Chadic). If the complement is inherently locative, such as the noun corresponding to 'home' or a toponym, the complement does not require a morphological marker indicating that it is a locative complement (all data from Frajzyngier, 2001):

Lele

(9a) *cànìgé* ***dà*** ***Debreng***
Canige **PREP** **Debreng**
'Canige is in Debreng'

(9b) *se* *è-gé* ***dà*** ***túgú*** *póì* *kúsíge-ŋ* *kè-y*
INCEPT go-3PL **PREP** **house** Poi Kusige-DEF GEN-3M
'they went to the house of Poi Kusige'

If the locative complement is not a toponym or the noun 'home', the noun must be followed by the postposition *nì*. The role of the postposition is solely to mark the noun as a locative complement. The postposition *ni* does not mark spatial relations or directionality:

(10a) *kama* ***dà*** *kùlmá* ***ni***
water PREP well LOC
'there is water in the well'

(10b) *kùrmbàlò* *tamɜ̃-y* *àn* *ná* *wáyngulú*
chief wife-3M leave ASSC morning
àgi-y *saar-iy* ***dà*** ***kàrgà-ro*** ***ni***
take-3M attach-3M PREP back-3F LOC
'The chief's wife left in the morning, took him and attached him to her back.'

The noun meaning ‘village’ is not a toponym, and therefore it is marked by the postposition *ni* for the locative complement function:

(11) ***dà*** *túgú* *tóŋ* ***ni*** *kara* *kóŋdírè* *kusi-ge* *sùbù*
PREP village certain LOC people young.PL body-3PL three
'In a village, there were three young men.'

The same distinction between toponyms and all other nouns as locative complements holds if the predicate is a verb of movement:
Non-toponym complement:

(12) *dày* *kóŋ* *na-y* *kálè* *jénè* *dà*
3M certain HYP-3M climb:FUT sit:FUT PREP
luŋba *kùrmbàlò* *kè-y* ***ni*** *na-y* *bórè*
horse chief GEN-3M LOC HYP-3M cut:FUT
sàríyà *na* *ùs-ìy* *ɗé*
verdict HYP concern:FUT-3M NEG
'The other [said] that if he could climb on the chief's horse and pronounce judgments, [they could kill him], he does not care.'

A toponym as a complement:

(13) *ná* *go* *ŋ* *è* ***debreng*** *ná* *díglé* *téy*
ASSC DEM 1SG go Debreng ASSC year holiday
ŋ *kìn* *(màní)* *ɗé* *àlé*
1SG return there NEG anymore
'From the time I went to Debreng for the New Year's holiday, I have not returned there'

When the noun *túgú* ‘home’ and toponyms function as locative complements they are not marked by the postposition *ni*. Nouns that do not inherently carry the feature [+locative] are marked for this function by the postposition *ni*.

English and other Western Indo-European languages do not have a locative predication that is different from other predications. Consequently, there are no inherently locative complements or inherently locative predicates, and the feature [locative] is not a feature of lexical items in English or other Western Indo-European languages. In English, all locative

complements must be marked as such by a preposition, as illustrated by translations of Lele examples above and the following examples from COCA (Davies, 2008).

Non-locative noun:

(14) In the seventh, with Arizona leading 5-3, the Wildcats went to McQuillin [a player].

Locative noun:

(15) Before you **went to the room** there was she dirty then?
*Before you **went the room** there was she dirty then?

Note, however, that although all complements must be marked for the locative function by a preposition that does not mean that English has a distinct locative predication. Prepositions in English code a variety of distinct meanings including associative, instrumental, benefactive, and malefactive and a variety of locative, spatial, and directional meanings.

The conclusion from the above illustration is that if a language has locative predication coded in its grammar, one should expect that some verbs and some nouns will have the feature [locative], while other verbs and nouns will not have this feature.

3 Hypothesis regarding lexical features

Recall that the main hypothesis of the present study is that some lexical items reflect some of the functions encoded in the grammatical systems. It appears that there are three types of relations between lexical items and functions encoded in the grammatical system: lexical items that inherently code the semantic feature encoded in the grammatical system; lexical items that neither code nor contradict the semantic feature; and lexical items that inherently contradict the semantic feature encoded in the grammatical system. With respect to the first group, no additional means are necessary to deploy the lexical item for the function whose feature the lexical item carries. With respect to the second group, some morphological or syntactic means may be necessary to deploy the lexical item. One of the functions of derivational morphology is to make a lexical item compatible with the function for which it is to be deployed. With respect to the third group, the deployment of lexical items would result in an internal contradiction between the meaning of the structure and the meaning of the lexical item. Therefore, one should not expect such lexical items to be deployed in the coding of functions that are contradicted by the inherent properties of lexical items, unless some operation is performed to avoid the internal contradiction.

Note that this scenario applies only to functions coded in the grammatical system. It does not apply to all meanings a speaker may want to express. If a meaning is not coded in the lexical items or in the grammatical system, which encompasses morphology and syntax, speakers may deploy a variety of periphrastic means, often different for different speakers.

The open question to be addressed later in this study is which functions are reflected in the inherent properties of lexical items. But first, the evidence for the hypothesis.

4 The evidence for the hypothesis

The evidence for the hypothesis that some functions encoded in the grammatical system are reflected in features of lexical items consists in demonstrating that if the feature reflecting the function coded in the grammatical system is present in the lexical item chosen to fill the components of the utterance coding a given function, no further coding is required. If the lexical item contains a feature that contradicts the function to be coded, such a lexical item cannot be inserted, as it would make the expression ungrammatical. This has been demonstrated above in the discussion of locative predication in section 2.1. Here are additional pieces of evidence.

4.1 Major lexical categories

The purpose of this section is to reinforce the claim that the very existence of 'major lexical categories' ('parts of speech', 'syntactic categories', Croft, 2001) is in itself the evidence that some functions encoded in the grammatical system are reflected in the inherent properties of lexical items. The major lexical categories usually consist of nouns, verbs, often adjectives and, less often, adverbs. The interest of these classes of lexical categories is that they occur in many languages. However, these categories are not universal, as they do not occur in all languages. In some languages, certain lexical items are inherently characterized as belonging to one or another class, as is the case with some verbs, nouns, and adjectives in English, while in other languages some categories must be morphologically derived, as is the case with many lexical categories in Semitic languages. There are also languages, the 'basic variety' types of Klein and Perdue (1997), that distinguish only two categories, e.g. verbs and non-verbs. Given the cross-linguistic variation among types of major lexical categories, their existence cannot be taken as an outcome of the very existence of a language. Therefore, the motivation for the existence of lexical categories has to be explained.

It has been long claimed that the existence of major lexical categories is motivated by their functions in larger constructions (Frajzyngier, 1986; Hengeveld, 1992; Croft, 1991, 2001). These larger functions involve predications that may involve some participants, the modification of an entity, and possibly the speaker's attitude toward a proposition. One can expect many languages to code such functions, and therefore one can expect similar lexicalizations across unrelated languages. But these lexicalizations are by no means universal. Lexicalization of various categories is an economic device that enables the deployment of the lexical item in a given function without the need for morphological or syntactic means to indicate the role of the lexical item. Indication of the specific functions of the lexical categories in the larger construction is necessitated by the principle of functional transparency, whereby the role of every constituent in the utterance must be transparent to the listener (Frajzyngier, 2004). The term 'role' refers to the role within the utterance, not the role of the constituent in some non-linguistic realm in the real or imaginary world. I do not address here the issue of how lexicalization of nouns, verbs, or adjective comes about. For speculation on this issue, see Croft (1991, 2001) and Behrens and Sasse (2003).

Once a major category has been lexicalized, the syntactic properties of many members of the category are mainly determined by narrower functions encoded in the grammatical systems of those languages. The principle involved is as follows: If the grammatical system encodes a

certain function, some lexical items carry this function as their inherent feature and other lexical items do not. The term 'feature' is here understood as a semantic characteristic that has consequences in the formation of the utterance (syntax). These features are the subject of the present study. This understanding of the term feature is different from the one in Kibort and Corbett (2010) and in Corbett (2012), where the term 'feature' seems to encompass both formal means of coding and functions. Since the functions encoded in the grammatical systems differ across languages, the features characterizing lexical items also differ across languages.

In addition to the evidence presented earlier for Mina, I will now present a few other cases supporting the hypothesis. I will then consider a logical follow-up, viz. whether there is a way to predict which functions encoded in the grammatical system of a language are reflected in the lexical features of the language.

4.2 The benefactive function in English

The following hypothesis is proposed in this section: the English construction V NP NP codes a benefactive function[4]. Some lexical items are compatible with the benefactive function and other lexical items are not. Consider the following example from COCA:

(16) He'd **pour** him a bowl of cold milk to drink- no, for all his troubles, he'd, by god, **cook him** a steak!

The evidence that (16) represents a benefactive predication is provided by the fact that replacing the verb 'pour' with the verb 'spill' or replacing the verb 'cook' with the verb 'ruin' would result in an ungrammatical utterance. The evidence that the construction V NP NP in English codes the benefactive predication is provided by the fact that if one uses a verb with an inherently deleterious meaning the construction yields either an ungrammatical outcome or is interpreted as benefactive. One piece of evidence for the proposed hypothesis is provided by the fact that there are no instances of 'broke him a [Noun]', 'broke her the [Noun]', 'burned him a [Noun]', 'burned her the [Noun]', 'stole him a [Noun]', 'stole her the [Noun]', 'ruined him a [Noun]', 'ruined her the [Noun]' in the multimillion-word corpus in COCA. A reader has pointed out that one can say 'burn me a hamburger' in English in a jocular way or in addressing somebody with doubtful cooking skills. This is indeed perfectly true, but the important fact here is that the clause is still understood as benefactive, and not as malefactive. Here is another example of the use of the verb 'burn' with benefactive meaning:

(17) All the time Mickey quietly fumed in the back seat; I had to ask her twice to burn me a second copy of the flycam footage, and even then she did so grudgingly. (COCA; 'burning' presumably involves making a CD or some other electronic copy rather than destroying something. The event takes place on an airplane).

There are plenty of instances where the verbs involving destruction, burning, and other adverse actions are followed by a direct object:

(18) Booze had nearly **destroyed him** a second time. (COCA)

There are four instances of ‘kill him a [Noun]’ in COCA. In all of these instances the indefinite article ‘a’ precedes an adverbial expression rather than a direct object:

(19) Apparently, there is a report that there was a threat made that they would **kill him** a week ago. (COCA)

Hence, in English some verbs must be marked for the feature [malefactive] to indicate that they cannot occur in the benefactive construction. One can use the verb ‘kill’ in a V NP NP construction, but when it is used it has a benefactive meaning:

(20) **Kill me a chicken**, send me the wing
They think I'm workin', Lord, I ain't doin' a thing.
Kill me a chicken, send me the head,
Think I'm workin', Lord, I'm layin' in bed. (Railroad Bill, Song by Ramblin' Jack Elliott lyrics © T.R.O. Inc).[5]

All transitive verbs, if not inherently malefactive, can presumably be used in the benefactive predication. The constructions V NP NP even when used with inherently malefactive verbs are interpreted as benefactive.

An anonymous reader has asked how one reconciles the fact that some grammatical functions encoded in the lexicon do not allow for internal contradiction between the inherent properties of lexical items and grammatical function encoded by a construction while others do appear to allow for internal contradiction. For example, Polish example (1) shows that verbs that inherently code the point of view of the subject do not co-occur with nouns coded for the goal function. On the other hand, the benefactive function coded by the structure V NP NP in English can co-occur with the seemingly inherently malefactive verb ‘kill’, as in example (20) above; moreover, the interpretation remains benefactive rather than malefactive. The case of example (20) and similar examples can be reconciled as follows: It is not merely the meaning of the verb that matters, but the meaning of the predication as a whole. Consider predications involving the verb ‘kill’. Killing a chicken most often implies providing food, resulting in an event that is benefactive rather than malefactive. Use of the same verb with a different complement, such as a person close to the subject, would result in internal contradiction between the benefactive function of the construction and the malefactive results of the verb plus complement.

The proposed analysis places the observations made by others with respect to the ditransitive construction in English, Goldberg (1995), Rappaport-Hovav and Levin (2008), Radetzky and Smith (2010), in a unified theoretical framework: it is the function encoded in the grammatical system that determines the form of clauses. The evidence that it is functions, rather than constructions, that interacts with the properties of lexical items is provided in a most interesting way by languages where the equivalent of the ditransitive construction does not interact with properties of lexical items because the ditransitive construction codes different functions.

Polish, like many other Indo-European languages with extensive case marking, has the dative case. The functions of the dative case remain the topic of lively controversy. With all predicates, the noun marked by the dative case is somehow affected by the event, whether positively, negatively, or in any other way. Consequently, verbs in Polish do not carry the

grammatically relevant features benefactive or malefactive, although they may indicate benefactive or malefactive activity. Any noun marked by the dative case can be used with any verb, and the interpretation of whether the event is benefactive, malefactive, or any other type depends on the properties of the verbs and the properties of the nouns that are used. Here are examples where the effect is benefactive:

Polish

(21) *Sam* *Coppola* ***ugotował*** ***mu*** *żeberka.*
INTENS:M Coppola cook:PRF:PAST:3M:SG 3M:SG:DAT spareribs
'Coppola himself cooked him spareribs' (NKJP)

In Polish, unlike in English, verbs that have a deleterious effect on the object can be used with nouns in the dative case. This is illustrated by the following examples, each containing a verb whose equivalent in English cannot occur in the ditransitive predication:

Polish

(22a) *Młodszy* *pod* *nieobecność* *brata* ***zniszczył***
younger:M:SG under absence brother:GEN destroy:PRF:PAST:3M:SG
mu *zeszyt* *do* *języka* *polskiego.*
3M:SG:DAT notebook to language:GEN Polish:GEN
'The younger one, while his brother was absent, ruined his Polish language notebook.' (NKJP)

(22b) *Dziewczyna* *mówiła* *prawdę;* *mędrzec*
girl speak:IMPF:PAST:3F:SG truth sage
ukradł ***mu*** *ciało!*
steal:PRF:PAST:3M:SG 3M:SG:DAT body:ACC
'The girl was telling the truth: the sage has stolen his body' (NKJP)

(22c) *Spirytus* *niemal* ***spalił*** ***mu*** *przełyk,*
pure alcohol almost burn PRF:PAST:3M:SG 3M:SG:DAT esophagus
'The pure alcohol almost burned down his esophagus.' (NKJP)

(22d) *z* *palcem* *na* *cynglu* *waha*
with finger on trigger hesitate:PRES:3SG
się *i* *waha,* *chociaż*
REFL CONJ hesitate:PRES:3SG even though
tamten ***zabił*** ***mu*** *brata.*
REM:DEM kill:PRF:PAST:3M:SG 3M:SG:DAT brother:ACC
'With the finger on the trigger he hesitates and hesitates, even though the other one killed his brother.' (NKJP)

(22e)	*a*	*Szarlej*	*krótkim*	*ciosem*	*z*	*góry*
	CONJ	Szarley	short:INSTR	hit:INSTR	from	above
	złamał	***mu***	*nos*.			
	break:PRF:PAST:3M:SG	3M:SG:DAT	nose:ACC			

'And Szarley$_1$, broke his$_2$ nose with a short hit from above' (NKJP)

In case one should want to interpret the clauses above as coding external possession, here are examples in which the dative-marked argument explicitly does not represent a possessor of the accusative-marked argument:

Polish

(23)	*I*	*przynieść*	***mi***	***jego***	*teczkę!*
	CONJ	bring:INF	1SG:DAT	3M:SG:POSS:ACC	file:ACC

'And bring me his file'! (NKJP)

And finally, the dative case can mark the second argument of an intransitive verb, again with benefactive interpretation, malefactive interpretation, or neither:

(24)	*Coto*	*skoczył*	***mu***	*do*	*pomocy*
	Coto	jump:3SG:PRF:PAST	3SG:DAT	to	help

'Coto jumped to help him' (NKJP)

The open question is why the function coded by the dative case in Polish is not reflected in the lexical properties of verbs, while the function coded by the VP NP NP construction in English function is so reflected.

5 Why some functions and not others are reflected in the lexicon

One of the most important questions emerging from this study is why some functions encoded in the grammatical system are reflected in the properties of the lexicon and other functions are not. To use issues discussed in the previous sections, more specific questions would be: (1) why English verbs have the features [benefactive] and [malefactive] and why Polish verbs are not sensitive to whatever function is coded by the dative case marking or, for that matter, to functions coded by any case marker; (2) why locative predication is reflected in the properties of lexical items in Chadic languages but other functions, such as associative, are not; and (3) why locative, associative, and instrumental functions coded by a large number of prepositions in English are not reflected in the lexical properties.

The discussion below must be considered tentative. In what follows, I advance some hypotheses with respect to functions that are not reflected in features of lexical items. I have no hypothesis that I can support with proper evidence as to which functions must be reflected in the lexical features.

An examination of an admittedly limited number of languages indicates that information structure and other pragmatic functions such as focus, topic, and new versus old information, are not reflected in the lexical properties of either nouns or verbs. Functions coded by phrasal

and clausal conjunctions, subordinators, complementizers, and by simple juxtaposition are also not reflected in the features of lexical items.

The cases of non-coding of features listed above would indicate that lexical items are sensitive only to functions whose scope does not extend beyond the clause or a phrase.

On the other hand, some inherent properties of lexical items, which form classes of verbs and nouns that behave in a similar way, are not necessarily a reflection of the functions coded by grammatical systems. Studies of aspectual properties of verbs in English, such as Vendler (1967), studies of verbs of motion in many languages, and studies of some aspectual properties (Talmy, 1985) represent classes of lexical items that share various properties but do not necessarily reflect the functions encoded in the grammatical system. These properties are outside of the scope of the present study.

6 Towards a more complete description of lexical items

The logical conclusion from the previous sections of the present study is that a description of the lexicon of a given language must include information about functions coded in the grammatical system that are reflected in the properties of lexical items. Moreover, given the conception of syntax as a coding means rather than as an independent component, the proposed approach explains the interrelationship between the properties of lexical items and the formation of structures to express various functions.

The features reflected in a lexical item are activated only when a given function is to be realized in the utterance. Thus, the features benefactive and malefactive in the English lexicon play no role when functions other than benefactive and malefactive are encoded. The features [benefactive] and [malefactive] are dormant, as it were, in all other predications:

(25a) He broke his normal routine by putting it in his laptop bag

(25b) It is a true tragedy that in the end **destroyed t**he entire family.

Features that affect the form of the utterance only when a specific function is encoded would need to be marked as such. Any type of representation of the features would be satisfactory provided it clearly marks the features reflecting grammatical functions. Traditional linguistics has been marking the features [noun] and [verb] for hundreds of years now. One would also need to mark features that are activated only in some functions, e.g. [locative], [benefactive], and [kinship], if kinship plays a role in some functions.

7 The diachrony of features of the lexicon

An important question is whether the lexical features that reflect functions encoded in the grammatical system are fixed and unchangeable or whether they are a product of language change. The answer must be that they are a product of language change. Consider the malefactive and the benefactive features of verbs in English. We know that related Indo-

European languages do not have such lexical features because they do not code the benefactive (or malefactive) function. Related Indo-European languages have a function, often labeled 'indirect object', encoded by the dative case. Hence, the features [malefactive] and [benefactive] with relevant syntactic properties emerged in the English lexicon after the loss of the dative case and the emergence of the benefactive function (Colleman & De Clerck, 2011). A more recent development in English is the encoding of the malefactive function through the construction V (NP) on NP, as in:

(26) He is going blind **on me** (said by a fellow dog walker about her dog)

Consequently, some predicates can be characterized as having the feature [+malefactive] in English and other languages, as demonstrated by Radetzky and Smith (2010). Such a feature does not exist in languages that code the indirect object function only.[6]

To conclude, lexical items may acquire features parallel with or after changes in the functions coded in the grammatical system.

8 Explanatory benefits of the approach

8.1 Explanation of syntactic versus non-syntactic features

Levin and Rappaport-Hovav (2005), Ramchand (2014) and references therein have rightly observed that individual lexical items have two types of features, namely those that affect syntax and those that do not. Neither Levin and Rappaport-Hovav (2005) nor Ramchand (2014) explains why some features affect syntax and others do not, nor do they explain why verbs referring to the same activities, as described earlier, vary in features that affect syntax. The present approach provides the explanation for the observations made in the earlier works.

8.2 Explanation of cross-linguistic differences

The fundamental question in the study of why lexical items referring to the same Qualia, in Pustejovsky's sense, have different syntactic properties across languages has not been addressed in previous studies of the syntactic properties of lexical items (Jackendoff, 1983, 1989, 1990; papers in Rappaport-Hovav, Levin, & Sichel, 2010a). In many functional approaches, especially those that take into consideration a wider number of languages, linguists have noted cross-linguistic differences with respect to the types of features encoded in lexical items, and more specifically the fact that features characterizing lexical items have an effect on syntax, e.g. Evans (2000) with respect to kinship verbs, Rijkhof (2000) with respect to classes of nouns and associated properties of adjectives, and Vogel (2000) and Broschart (2000) with respect to features determining lexical categories. By now, the readers may already have reached the answer that the author intends to provide. But just in case, here it is stated explicitly: lexicons of individual languages reflect some functions encoded in their grammatical systems.

The most important conclusion from this study is that the lexicon of any language is not a set of words with idiosyncratic characteristics but rather a set consisting of classes that reflect functions encoded in the grammatical system.

9 Open questions

A few questions have been left open in the present study. One question is whether all lexical categories reflect functions encoded in the grammatical system, and whether there are lexical categories that are immune to the functions encoded in the grammatical system. Ideophones may be such a category (Haiman, 2018 and Seongha Rhee's presentation at *20th International Congress of Linguistics*).

The question of which functions encoded in the grammatical system are reflected in the lexicon and which are not remains an open question. A future typology of functions encoded in grammatical systems will hopefully produce a hierarchy of functions encoded more often and less often in grammatical systems. Such a hierarchy will then serve as a research tool to see which elements of this hierarchy are encoded more often and which are encoded less often in the lexicon. The limited data looked at so far indicate that clause-internal relations are reflected in the lexicon more often than functions in other domains.

The grammatical relations subject and object do not appear to be reflected in the lexical features, even though many languages code those relations. This raises the question whether the traditional division between subject and object, rather than being a function coded in the language, is not merely a coding means whose main function is to distinguish two arguments without indicating the role of the arguments.

A study of the features characterizing lexical items can serve as a tool for the discovery of functions that were once encoded in the grammatical systems but have since been lost or replaced by other functions.

Notes

[1] I dedicate this study to the memory of Frank Lichtenberk, a linguist I very much respected, a good friend and a most gracious host. I also had an honor and pleasure of hosting him in Boulder, where he gave a much appreciated talk. We shared many views on a large number of issues. His passing was a personal loss for me.

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[3] The term ‘construction’ is used in the present study, in its traditional meaning, viz. a form that consists of more than one formal constituent and syntactically behaves like a single constituent. This corresponds to Bloomfield’s (1933) endocentric constructions. The notion of meaning is not involved in the definition of the term ‘construction’.

[4] Some benefactive inferences in English can also be drawn from other constructions, e.g. from constructions involving the preposition ‘for’ with intransitive and transitive verbs. See Kittilä (2005) for the classification of different kinds of beneficiaries. Colemann (2010), following Goldberg (1995), considers the V NP NP construction as basically coding the recipient and considers the other meaning to be extensions of this basic meaning.

[5] https://songmeanings.com/songs/view/3530822107859086198/, thanks to Scott DeLancey, p.c. for directing me to this example.

[6] Frajzyngier (2013) demonstrates that some languages code the indirect object function and the benefactive function at the same time in their grammatical system.

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Abbreviations

1	First-person
2	Second-person
3	Third-person
ACC	Accusative
AFF	Affected
APPL	Applicative
Ar	Arabic
ASSC	Associative
C.FOC	Contrastive focus
COL	Collective
COM	Comment marker
COMP	Complementizer
CONJ	Conjunction
DAT	Dative
DED	Deduced
DEF	Definite
DEM	Demonstrative
DEST	Destinative
DET	Determiner
DOF	Determiner of a function
EE	End of event
EP	Epenthetic
EX	Existential
EXCL	Exclusive
FOC	Focus
FUT	Future
GEN	Genitive
GOAL	Goal
HL	Human locative
HYP	Hypothetical
IMP	Imperative
IMPF	Imperfective
IN	Inner space
INCL	Inclusive
INF	Infinitive
INSTR	Instrumental
INTENS	Intensifier
LOC	Locative
M	Masculine
N	Noun
NEG	Negative
NOM	Nominalizer
NP	Noun phrase
NUM	Numeral
OBJ	Object
ON	Extension ‘on’
OPT	Optative
OUT	Extension ‘out’
PAST	Past
PL	Plural
POSS	Possessive
PNCT	Punctual
PRED	Predicator
PREP	Preposition
PRES	Present
PRF	Perfective
PRO	Pronoun
PROG	Progressive
PROX	Proximate
Q	Question
RE	Reverse
REFL	Reflexive
REL	Relative
REM	Remote
RQ	Rhetorical question
S	Source; subject
SEQ	Sequential
SG	Singular
STAT	Stative
T	Target
TO	Destinative preposition ‘to’
TOG	Together (plural participants)
TOP	Topicalization
VENT	Ventive