Arguments and Adjuncts: at the Syntax-Semantics Interface[*]

ROXANA-MARIA BARBU   IDA TOIVONEN
Carleton University   Carleton University
roxanamariabarbu@cmail.carleton.ca   ida_toivonen@carleton.ca

Abstract: There is a clear and intuitive distinction between arguments and adjuncts, yet the exact nature of this distinction has been difficult to characterize. We report the results of an experimental study that indicates that there is not only a difference between arguments and adjuncts, but also between semantic and syntactic arguments. The study consisted of two tasks. The first task elicited speakers' semantic intuitions, based solely on the meaning of specific verbs, and the second asked speakers to create sentences with the same verbs. We focused on verb classes controversial with respect to their argument structure. We specifically considered verbs that possibly require more than three arguments, instrument verbs, and motion verbs.

1.   Introduction

The relationship between heads (typically verbs) and their arguments is central to syntax and semantics, yet the notion of argumenthood has proven difficult to define. Textbook definitions commonly point to two main characteristics that identify arguments: they are semantically core participants of the activity or state denoted by the verb, and they are syntactically obligatory (Kroeger 2004, Tallerman 2005). Consider (1), for example:

(1)   The child kicked a ball in the park.

In (1), *the child* is the kicker and *a ball* is kicked, and both are actively engaged in the activity denoted by the verb, whereas *in the park* merely denotes the setting of the entire event. Time and place expressions can be specified for any event, and are therefore not specific to or required by the verb itself. *The child* and *a ball* are arguments in (1), and *in the park* is an adjunct.

It has often been noted that the notion of semantic core participants does not always align with the arguments that are expressed in the syntax (Jackendoff 2002, Ágel and Fischer 2009, Ackema 2015, a.o.). For example, expletive subjects are not semantic arguments of the verb. It is also possible for semantic arguments to be left unexpressed, as in *we were eating*.

Whether or not an argument is obligatory seems to be a syntactic criterion, and the syntax can also place other requirements on arguments that seem independent of semantics. To illustrate this point, we consider verbs of food consumption. Examples include *eat*, *devour*, *dine*, *munch*, *nibble*, *chow*, *feast*, and *snack*. While all of these verbs seem to involve the same participants,

---

someone eating and something being eaten, they differ in how these participants are linguistically expressed. The verb *eat* takes an optional object (2) (as indicated by the parentheses); the verb *devour* takes an obligatory object (3); and the verb *dine* cannot take a direct NP object (4):

(2)   Ehsan ate (a pizza).

(3)   Dan devoured the poutine.

(4)   Chris and Krista were dining.

The verbs *munch*, *nibble* and *chow* can take a complement, but not as a plain NP object. The preposition *on* is required for *munch* and *nibble* (5), and the particle *down* (often followed by the preposition *on*) is required for *chow* (6):

(5)   Mary munched/nibbled on some potato chips.

(6)   Omid chowed down on a hamburger.

The verbs *feast* and *snack* take an optional argument (7-8), which is expressed as an *on*-PP:

(7)   Marly snacked (on some carrots).

(8)   The men feasted (on smoked salmon and champagne).

Together, the examples in (2-8) illustrate that meaning is not sufficient in determining the arguments of a verb. Contrasting examples (2, 7-8) with (3-6), we notice a discrepancy between the number of participants required by the meaning of the verb, and their obligatoriness in a linguistic string. This discrepancy can be interpreted as a syntax-semantics mismatch.

There thus seem to be two sides to argumenthood: semantic intuitions about what participants are crucial to an event, and syntactic intuitions about what should be expressed and how (e.g., Grimshaw 1990, Jackendoff 2002, Ackema 2015). This paper reports the results of two tasks designed to tap into these distinct aspects of argumenthood. The first task elicited intuitions about participants conceptually needed for different events to occur. The second task gauged what participants are syntactically needed for a sentence to be considered linguistically complete. The experiment is presented in section 3. Before that, we provide a brief overview of how the argument-adjunct distinction is captured in various theories of syntax and semantics (section 2).

2.   Arguments and adjuncts across theories

This section provides a very brief overview of the theoretical status of arguments and adjuncts in a selection of grammatical frameworks. The main conclusion is that despite other differences, the

connection between the verb and its arguments is central to most, perhaps all, approaches to syntax and semantics.

We begin our discussion with Lucien Tesnière's Dependency Grammar (DG) and Valency Theory because the grammatical theories rooted in that framework all have in common an emphasis on the connection between the verb and its dependents (Tesnière 1959, Ágel et al. 2003, Ágel and Fischer 2009). Tesnière compares sentences to dramas with *actants* (actors) and *circonstants* (circumstances). The actants are arguments and the circumstances are adjuncts. The verb and the actants form the center of the sentence, and the circumstances are external to the core, framing the center. The meaning of the verb largely dictates how many actants the verb takes. The distinction between arguments and adjuncts is thus core to the group of theories that have developed from Tesnière's DG. However, researchers within that paradigm have long recognized that the distinction is not always obvious and straightforward. For example, Jacobs (1994) argues that valency is a multidimensional phenomenon with a number of relevant factors (e.g., obligatoriness and case marking) that do not necessarily align.

In Role and Reference Grammar (RRG; Van Valin and LaPolla 1997, Van Valin 2005), the sentence is divided into three parts: nucleus, core and periphery. The nucleus contains the predicate (the verb), and the core consists of the nucleus and its arguments. The periphery contains the non-arguments (adjuncts). The lexicon is central in RRG, but lexical information contains mainly semantic information. Based on the lexical information, verbs are categorized into different semantic classes, and information about semantic roles follow from this classification. Syntactic subcategorization is not directly encoded in the lexical entries, but is derived by general principles from the semantics. In sum, the distinction between arguments and adjuncts is crucial in RRG, since the sentence is organized to separate arguments from adjuncts by distinguishing the core from the periphery, and information about argument structure is indirectly deduced from lexical information.

The conceptualization of grammar embraced by the Minimalist Program (MP) and its predecessor, Government and Binding Theory (GB) is quite different from that developed in DG and RRG, but the relationship between the verbal head and its arguments is central to all of these frameworks. In GB, two central principles constrain the distribution of arguments: the Theta-Criterion and the Projection Principle (e.g., Chomsky 1981). Together, these principles ensure that information about the verb's arguments is represented at every level of syntactic representation. The verb lexically specifies the number of theta-roles (thematic roles) it assigns. The theta-roles must then be assigned to every syntactic argument, and only to syntactic arguments (the Theta Criterion). This information must be present at every stage of the derivation (the Projection Principle). These core grammatical principles do not cover the presence and distribution of adjuncts. The difference between arguments and adjuncts is also crucially signaled in the phrase-structural representation, which is central to both GB and MP. Arguments occupy specifier and complement positions, whereas adjuncts are adjoined: their sister phrase is the same as their mother phrase ("Chomsky-adjunction").

The transition between GB and MP was gradual, and many versions of MP maintain the Projection Principle and the Theta Criterion (van de Koot 1994, Adger 2003). Arguments and adjuncts are also assumed to differ phrase-structurally in MP just as in GB. However, there are several views on exactly how arguments and adjuncts differ in the phrase structure. Some still represent adjunction with Chomsky-adjunction, as in GB. Chomsky (1995, Chapter 4) suggests that adjunct phrases are labelled differently than argument phrases. Hornstein (2009, Chapter 4) proposes that, contrary to previous accounts, adjuncts are structurally simpler than arguments: arguments are part of complex, labelled structures, whereas adjuncts modify the event directly by concatenation. Despite these theoretical differences, the approaches to argumenthood within GB and MP seem to have in common the idea that verbs are lexically specified for their arguments, typically in terms of thematic roles. Also, the argument-adjunct distinction is in general important across different versions of the framework.

In Lexical-Functional Grammar (LFG; Kaplan and Bresnan 1982, Dalrymple 2001, Bresnan et al. 2016), different kinds of linguistic information are modelled by distinct, parallel grammatical modules. Each module is formalized with its own type of representation (e.g., syntactic trees, feature structures). The connection between a verb and its arguments and the argument-adjunct distinction are crucial in each of the three syntactic modules: c(constituent)-structure, f(unctional)-structure, and a(rgument)-structure. At c-structure, arguments appear in complement or specifier position and adjuncts appear in adjunct positions, if a configurational language is being modelled. A-structure models the basic specifications of the argument structure of verbs: each head is associated with a list of arguments ordered according to the thematic hierarchy. A-structure also models the mappings between different forms of verbs, such as passives and applicatives. Information about adjuncts is not included in the a-structure. F-structure models grammatical functions (e.g., SUBJECT, OBJECT) as features structures. There are specific adjunct functions (ADJUNCT, XADJUNCT), the other functions are different argument functions. Two principles, Completeness and Coherence, ensure that exactly the arguments specified by the predicate are present in the f-structure headed by that predicate.

In Head-Driven Phrase Structure Grammar (HPSG; Pollard and Sag 1994), arguments are introduced as an ordered list, lexically associated with heads. The list is the value of a feature called "SUBCAT" (for subcategorization). The arguments are ordered on this list according to the obliqueness hierarchy (Pollard and Sag 1987, 21–23, 32). In contrast, adjuncts select their heads through a specific function called MOD(ifier) (Pollard and Sag 1987, 55–56). Later work (Sag et al. 2003) split the SUBCAT feature into two features: VALENCE, where the arguments are separate so that the external argument occupies its own list, and "ARG-ST" (for argument structure), which allows reference to all arguments on the same list. In Sag et al. (2003), modifiers are introduced with a special head-modifier rule, which adds members to a separate list ("MOD") alongside the argument lists as part of the VALENCE feature.

Construction Grammar (CG; Goldberg 1995, Kay and Fillmore 1999) differs from the approaches listed above in that arguments are not necessarily introduced by lexical heads. Arguments can also be introduced by constructions. The verb and the arguments introduced by the

verb must match the semantic characteristics of the construction and its arguments (Goldberg 1995, 2006). The arguments introduced by constructions can be compared to arguments introduced by derivational morphology (such as applicatives) and lexical rules in many other frameworks. Adjuncts are introduced by their own constructions (Kay 2005, Goldberg 2006). The constructional approach to argumenthood is a bit different from the approach of other theories, but the distinction between arguments and adjuncts is nevertheless important in CG.

This concludes our discussion of theoretical approaches to the argument-adjunct distinction. The overview here is superficial and more can be said (and has been said) about argumenthood in the frameworks listed here, as well as in frameworks that we have not mentioned. For example, we have not said anything about formal semantics, even though the argument-adjunct distinction is not only crucial but in fact presupposed in first-order predicate logic, for example. Arguments and adjuncts are also clearly distinct in Davidsonian event semantics. We will not present more details here, but we hope this basic review has served to remind the reader that the following two questions are central to most formal approaches to grammar: How do we represent the argument structure of verbs? How do arguments differ from adjuncts?

3.   Current Study

The present study explored speakers' intuitions about verbs and their participants. We were interested in what participants certain verbs require, and their argumenthood status. More specifically, we wanted to investigate, for a variety of verbs, whether naïve speakers portray these participants as syntactic arguments, semantic arguments, or both. We attempted to capture the distinction between syntactic and semantic arguments with two tasks. In task 1, speakers were presented with a verb (e.g., *eat*) and asked to state the participants required for the event denoted by the verb, as illustrated in Table 1:

Table 1: Experimental design for task 1, aimed to capture speakers' semantic intuitions

Task 1: Instructions and sample answers
Imagine an *eating* event is taking place in a large box. What needs to be in the box (people, objects, places, etc.) for *eating* to take place? *Possible answers:* a person; a person and food; a person, food, place, etc.
Now imagine a *dancing* event. What needs to be in the box? Possible answers: a dancer; a dancer and a place; a dancer, place, song, etc.

In task 2, speakers were presented with the beginning of a sentence and asked to complete the sentence as they found appropriate.

Table 2: Experimental design for task 2, aimed to capture speakers' syntactic intuitions

Task 2: Instructions and sample answers
Please complete the following sentences however makes most sense to you.
Given the phrase *'The man sang,'* possible ways to complete it include but are not limited to: not adding anything (*The man sang*); a song; a song about love;

| a song about love for his wife, etc. |
| Please limit your responses to include only information that you find necessary for the sentence you formed to make sense. |

The experimental design was inspired by Jackendoff's (2002, p. 132-134) distinction between semantic and syntactic arguments. For example, given a verb such as *devour*, two participants are necessary "some character has to be cramming some other character (or some stuff) into its mouth." These participants, essential to the meaning of the verb, are referred to as semantic arguments. We intended task 1 to capture speakers' semantic intuitions, as they were encouraged to imagine the event, perhaps visualizing it, rather than forming a sentence.

In task 2, we asked speakers to complete a sentence, arguably tapping into their syntactic intuitions. Jackendoff (2002, p.132) suggests that syntactic arguments are best revealed in sentences illustrating the simple active use of the verb, as in the sentence *The lamb devoured the lion.* We included ditransitive verbs as control verbs, as there is little disagreement with respect to how many and what arguments they require. Our target verbs were verbs potentially requiring four or more arguments, motion verbs, and instrument verbs. For more details about our experimental design, see Barbu (2015), Barbu and Toivonen (2016).

3.1.   Subjects
Seventy-nine English speakers between the ages of 18 and 24 were recruited from Carleton University, using the school's psychology recruitment system. As reimbursement for their participation, students received 0.75% class credit towards a course. Since our intention was to investigate naïve speakers' intuitions, students who had taken a course in linguistics were not eligible.

3.2.   Control verbs: ditransitive verbs
Ditransitive verbs are verbs with two arguments, typically a recipient/beneficiary/addressee argument and a theme argument, in addition to the subject. An example of such a verb is *pass*. A *passing* event requires three participants: someone passing something to someone, so we can assume that *pass* takes three semantic arguments. In terms of syntactic arguments, a match between semantics and syntax gives rise to a well formed sentence (9a), omitting the recipient gives rise to a sentence that sounds odd out of context (9b), and omitting both the recipient and the theme gives rise to an ungrammatical sentence (9c):

(9)   a.   The mother passed the plate to the boy.
      b.   ? The mother passed the plate.
      c.   * The mother passed.

We expected speakers to state three participants in both tasks. Table 3 illustrates the proportion of speakers who mentioned the recipient/beneficiary/addressee and the theme in task 1 (as semantic arguments) and in task 2 (as syntactic arguments). The responses are given per verb. For

example, when presented with a *giving* event, in task 1, 95% of the speakers mentioned a theme (e.g., donations, gifts, wrapped present), and 25% mentioned a recipient (e.g., the receiver, a person to receive, recipient); in task 2, 100% mentioned a theme (e.g., a kiss, her time, a gift), and 65% mentioned a recipient (e.g., her child, her baby, her daughter).

Table 3: Mentions of Theme and Recipient as Semantic and Syntactic Arguments

	Semantic (task 1)			Syntactic (task 2)	
	Theme	Recipient[1]	People[2]	Theme	Recipient
Feed	100%	30%	70%	50%	90%
Give	95%	25%	80%	100%	65%
Send	80%	5%	40%	100%	79%
Bring	79%	10%	60%	100%	40%
Deny	26%	32%	84%	100%	10%
Promise	22%	11%	61%	95%	37%

With respect to theme, *feed*, *give*, *send* and *bring* seem to group together, as theme is a strong semantic argument; on the other hand, in the case of *deny* and *promise*, what is being denied or promised seems to be semantically unnecessary. From a syntactic perspective, theme is a strong candidate as a potential argument for all verbs aside from *feed*, where only 50% mentioned it. With respect to the recipient, at first sight it seems to be mentioned more often in task 2 than in task 1; however, no generalizations can be drawn as the responses included in the *People* category are unclear with respect to their status as agent, recipient, or both. In task 2, it seems that theme is preferred over recipient as to whether it is syntactically expressed in a linguistic string. In sum, while there was variation across speakers, both themes and recipients were mentioned in both tasks, suggesting both are potential semantic and syntactic arguments.

3.3. Verbs requiring three or four arguments

It has been claimed that verbs can take at most three arguments (Tesnière, 1959, p.108); however, certain verbs are argued to potentially take four (Adger, 2003, p.61; Steedman, 2000, p. 32). For example, a *betting* event requires four participants: someone betting with someone that something might or might not happen and a price/reward/punishment for the winner or loser. The

---

[1] Recipient is used here loosely, for example, in the case of *denying*, it refers to the person being denied something.

[2] The People category was included in task 1 to accommodate for its open nature. While in task 2 speakers were provided the subject, that was not the case in task 1, and oftentimes speakers mentioned it. Also, some answers were difficult to interpret as agent or theme as they provided examples such as *people*, or *a person*.

verb *bet* thus potentially takes four semantic arguments. Syntactically, however, while all four arguments can be present (10a), they need not be (10b):

(10)   a.   I bet you $20 that Messi will score.
       b.   I bet it will rain.

Other verbs that may take four arguments are transaction verbs such as *purchase*, *buy* and *sell*. We expected speakers to state (up to) four participants in task 1, since such verbs require someone buying or selling something from/to someone, and a price. While all participants are crucial to the event, just as for *bet*, some participants can be omitted without rendering the sentence ungrammatical. Therefore, in task 2, we expected speakers to mention fewer participants.

Table 4 illustrates the proportion of speakers who mentioned the theme, seller/buyer, and price in the two tasks, for each verb given. For example, when presented with a *purchasing* event in task 1, 95% of the speakers mentioned a theme (e.g., merchandise, an object or product to be purchased, items to purchase), 25% mentioned a seller (e.g., a salesperson, a cashier to assist with the purchasing, cashier), and 83% mentioned a price (e.g., money; master card; wallet, money, cards); in task 2, 100% mentioned a theme (e.g., a telephone, some antibiotics, the deluxe package), and none of the speakers mentioned the seller or the price.

Table 4: Mentions of Theme, Seller/Buyer, and Price as a Semantic and Syntactic Arguments

	Semantic (task 1)				Syntactic (task 2)		
	Theme	Seller/Buyer	People	Price	Theme	Seller/Buyer	Price
Purchase	95%	25%	80%	83%	100%	0%	0%
Buy	22%	11%	61%	47%	95%	37%	0%
Sell	26%	32%	84%	21%	100%	10%	5%

Surprisingly, even though *purchasing* and *buying* are synonyms, they seem to differ in what semantic arguments they require. Both the seller and buyer were mentioned by less than 50% of the speakers in both tasks, suggesting it is a very weak semantic and syntactic argument. In task 1, theme and price were mentioned by the majority of speakers for *purchasing*, but not for *buying*. On the other hand, responses to task 2 suggest that theme is a strong candidate as a syntactic argument for both verbs while price is syntactically unnecessary. Similarly, for *sell* the theme was barely mentioned in task 1, while task 2 suggests it is a syntactic argument. A possible interpretation of these results is that, at least for some of these transaction verbs, the theme is a syntactic but not a semantic argument, and the price is conversely a semantic but not a syntactic argument.

3.4.   Verbs requiring many arguments

We previously mentioned that there might be a cap of three or four arguments. However, Apresjan (1992, p.137) challenges this claim and argues that verbs can have not only four, but

also five or six arguments. A five-argument verb would be *rent*. A *renting* event requires some-one renting, what is being rented (e.g., an apartment), from whom, for what period of time, and a compensation, as illustrated in (11):

(11)   a.   She is renting an apartment from Vertica Riversides for a year for $1040/month.

Similarly, the verb *dispatch* is expected to have six arguments: someone sending someone, a point of departure, a point of arrival, a reason/goal, and a period of time. Arguably, the rea-son/goal is crucial because dispatching implies that the trip is undertaken to perform a certain task at the point of destination. Similarly, a period of time is required because the person who has been dispatched needs to return at some point, in contrast to *sending*, for example (Apresjan, 1992, p.140). However, not all these participants need to be overtly expressed.

The verbs included here are very similar in meaning: *expatriate*, *deport*, *evacuate*, *exile* and *expel*. We expected up to five participants: someone expatriating someone, initial location, tar-get location, and a reason. Table 5 illustrates the proportion of speakers who mentioned a patient, initial location (source), target location (goal) and reason. For example, when presented with *ex-patriate* in task 1, 20% of the speakers mentioned the patient (e.g., expatriate, an immigrant, in-dividual), 20% mentioned the source (e.g., a country of origin, home country), 20% the goal (e.g., a country to travel to, foreign country, foreign place), and no speakers mentioned a reason. In task 2, all speakers mentioned the patient (e.g., foreign citizens, an offender, its prisoners of war), 5% mentioned the source (e.g., from the building), 5% mentioned the goal (to Siberia), and 5% mentioned a reason (e.g., who were against the government's controversial policies). Over-all, the patient was mentioned by 53% or less of the speakers in task 1, and by the majority in task 2, suggesting it is strong syntactic argument. Places were mentioned by less than 50% of the speakers in all verbs except *evacuate* in task 1, and were negligibly mentioned in task 2. In task 1, reason was mentioned for *evacuate* by 45% of the speakers, and in task 2, for the verbs *expel*, *evacuate* and *expatriate* by 35%, 21% and 5%, respectively.

Table 5: Mentions of Theme, Source, and Goal Semantic and Syntactic Arguments

	Semantic (task 1)					Syntactic (task 2)			
	Patient	Source	Goal	Place[3]	Reason	Patient	Source	Goal	Reason
Evacuate	5%	25%	5%	70%	45%	95%	5%	0%	21%
Expatriate	20%	20%	20%	27%	0%	100%	5%	5%	5%
Exile	47%	5%	16%	26%	0%	100%	0%	5%	0%
Deport	21%	5%	11%	21%	0%	100%	0%	5%	0%
Expel	53%	12%	0%	18%	0%	100%	0%	0%	35%

---

[3] Here Place refers to any mentions of a location, be it a source, goal, or path. It also includes answers that were un-clear as to which category they belong in (e.g., place, airport, in the water).

Source, goal and reason seem to be neither semantic nor syntactic arguments. Based on these results, it is difficult to argue that any of the verbs actually take more than three arguments.

3.5.   Instrument verbs

Instrument verbs refer to a class of verbs that require some sort of tool or utensil as in (12):

(12)   a.   The chef cut the turkey with a knife.

There is little agreement as to whether instruments such as *with a knife* are arguments or adjuncts. In this study we were interested in whether speakers would mention instruments as semantic arguments, as syntactic arguments, or both. Table 6 illustrates the proportion of speakers who mentioned the theme and instrument in the two tasks. For example, when presented with a *cutting* event, less than half of the speakers mentioned a theme in task 1; while the majority did in task 2 for all verbs except *cut*, where the responses were reversed. The difference between the tasks was even more striking with respect to the mentions of instruments: while at least some of the speakers mentioned an instrument for each of the verbs in task 1, almost none did in task 2.

Table 6: Mentions of Themes, and Instruments as Semantic and Syntactic Arguments

	Semantic (task 1)		Syntactic (task 2)	
	Theme	Instrument	Theme	Instrument
Cut	74%	39%	20%	0%
Draw	0%	47%	90%	0%
Paint	15%	80%	100%	0%
Scrape	32%	85%	100%	0%
Scratch	45%	90%	95%	0%
Scrub	32%	95%	100%	0%
Sketch	15%	95%	100%	0%
Write	15%	100%	85%	5%

In summary, results suggest that theme is a weak semantic argument but a strong syntactic argument. On the other hand, instruments are strong semantic arguments but not syntactic.

3.6.   Motion verbs

Motion verbs describe events involving some kind of movement and are often accompanied by a location: a source, a goal, or a path. While motion verbs can be accompanied by any of these location types (source, goal, path) or a combination, it is unclear whether these are arguments or adjuncts. For example, consider (13a-e) where each illustrates a different use of the verb: a) standalone verb; b) verb + goal; c) verb + source; d) verb + source + goal; and e) verb + path:

(13) a. Sarah ran.
      b. Sarah ran to the beach.
      c. Sarah ran from the beach.
      d. Sarah ran from the beach to the house.
      e. Sarah ran along the shore.

We were interested in whether speakers would mention a place more predominantly in one task or the other, as well as whether certain verbs are more frequently used with a goal, source, path or any combination than others. Table 7 illustrates the proportion of speakers who mentioned the goal, source and path in the two tasks. For example, when presented with an *arriving* event, 15% of the speakers mentioned a goal in task 1, while 35% did in task 2.

Table 7: Mentions of Source, Goal and Path as Semantic and Syntactic Arguments

	Semantic (task 1)				Syntactic (task 2)			
	Goal	Source	Path	Place[3]	Goal	Source	Path	Place
Climb	5%	0%	0%	89%	10%	0%	5%	100%
Travel	11%	0%	0%	15%	84%	0%	16%	100%
Swim	0%	0%	0%	85%	32%	0%	32%	89%
Arrive	15%	5%	0%	55%	35%	0%	0%	35%
Enter	0%	0%	0%	10%	89%	0%	0%	89%
Float	0%	0%	0%	50%	6%	0%	22%	83%
Crawl	0%	0%	0%	37%	20%	10%	40%	80%

Place seems to be a weak potential semantic argument and a strong syntactic potential argument. Note that goals are mentioned more often than sources and paths. This lends support to the claim that some motion verbs take goals as arguments (see Kearns 2011, p.39; Van Luven 2014).

4.   Conclusion

In this study, we addressed a number of verb classes with controversial valence. For example, are *goals* arguments of motion verbs? We specifically addressed the following question: Do naïve speakers perceive phrases with unclear argumenthood status as semantically obligatory, syntactically obligatory, or both? Despite the noise in the data, the two tasks were successful at capturing the distinction between semantic and syntactic arguments. This was most clear for instruments and price. This experiment therefore suggests that while instrument phrases and price phrases are potential semantic arguments, they behave as adjuncts syntactically. The fact that our data contained a lot of noise is at least in part due to the open-ended nature of the tasks. To address this problem, future studies could involve a brief training session, where the speakers are taught to better understand what we mean by conceptually necessary in task 1. It might also be beneficial to stress to the speakers that they are expected to limit their answers in task 2 to what is strictly necessary for a sentence to be acceptable.

References

Ackema, Peter. 2015. Arguments and adjuncts. In Tibor Kiss and Artemis Alexiadou (eds.), *Syntax: Theory and analysis*. Berlin: De Gruyter Mouton, 246–274.

Adger, David. 2003. *Core syntax: A minimalist approach (Vol. 33)*. Oxford: Oxford University Press.

Ágel, Vilmos, and Klaus Fischer. 2009. Dependency Grammar and Valency Theory. In Bernd Heine and Heiko Narrog (eds.), *The Oxford Handbook of Linguistic Analysis*. Oxford: Oxford University Press, 223–255.

Ágel, Vilmos, Ludwig Eichinger, Hans Werner Eroms, Peter Hellwig, Hans Jurgen Heringer, and Henning Lobin, (eds.). 2003. *Dependenz und Valenz*. Berlin: De Gruyter Mouton.

Apresjan, Yuri Derenikovich. 1992. *Lexical Semantics: User's guide to contemporary Russian vocabulary*. No. 13. Karoma Pub.

Barbu, Roxana-Maria. 2015. Verbs and Participants: Nonlinguists' intuitions. Master's Thesis, Carleton University.

Barbu, Roxana-Maria and Ida Toivonen. 2016. Event participants and linguistic arguments. *Proceedings of the 38th Annual Meeting of the Cognitive Science Society.*

Bresnan, Joan, Ash Asudeh, Ida Toivonen, and Stephen Wechsler. 2016. *Lexical Functional Syntax (2nd edition)*. Hoboken, NJ: Wiley-Blackwell.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris Publications.

Chomsky, Noam. 1995. *The Minimalist Program*. Vol. 28. Cambridge, MA: MIT press.

Dalrymple, Mary. 2001. *Lexical Functional Grammar*. Syntax and Semantics 34. New York, NY: Academic Press.

Goldberg, Adele. 1995. *Constructions. A Construction Grammar approach to argument structure*. Chicago, IL: University of Chicago Press.

Goldberg, Adele. 2006. *Constructions at Work: The nature of generalization in language*. Oxford: Oxford University Press,

Grimshaw, Jane. 1990. *Argument Structure*. Cambridge, MA: MIT Press

Hornstein, Nobert. 2009. *A Theory of Syntax: Minimal operations and Universal Grammar*. Cambridge: Cambridge University Press.

Jackendoff, Ray. 2002. *Foundation of Language: Brain, meaning, grammar, evolution*.

Jacobs, Joachim. 1994. *Kontra Valenz*. trier: Wissenschaftlicher Verlag.

Kaplan, Ronald M., and Joan Bresnan. 1982. Lexical-Functional Grammar: A formal system for grammatical representation. In Joan Bresnan (ed.), *The Mental Representation of Grammatical Relations*. Cambridge, MA: MIT, 173–281.

Kay, Paul, and Charles Fillmore. 1999. Grammatical constructions and linguistic generalization: The *What's X doing Y?* construction. *Language* 75(1): 1–33.

Kay, Paul. 2005. Argument-structure constructions and the argument-adjunct distinction. In Hans C. Boas and Mirjam Fried (eds.), *Grammatical Constructions: Back to the roots*. Amsterdam/Philadelphia: John Benjamins, 71-98.

Kearns, Kate. 2011. *Semantics (2ⁿᵈ edition)*. Palgrave Modern Linguistics.

Kroeger, Paul R. 2004. *Analyzing Syntax: A Lexical-functional approach*. Cambridge: Cambridge University Press.

Pollard, Carl, and Ivan Sag. 1994. *Head-Driven Phrase Structure Grammar*. Stanford: CSLI.

Sag, Ivan, Thomas Wasow, and Emily Bender. 2003. *Syntactic Theory: A formal introduction (2ⁿᵈ edition)*. Stanford, CA: CSLI.

Steedman, Mark. 2000. *The Syntactic Process* (Vol. 24). Cambridge, MA: MIT press.

Tallerman, Maggie. 2005. *Understanding Syntax*, 2nd edition. London: Hodder Arnold.

Tesnière, Lucien. 1959. *Éléments de syntaxe structurale*. Paris: Klincksieck.

van de Koot, Hans. 1994. The Projection Principle in the Minimalist Program. In UCLWPL 6, 125–148. London: UCL.

Van Luven, Katie. 2014. The argument status of directional PPs. Master's thesis, Carleton University.

Van Valin, Robert, and Randy J. LaPolla. 1997. *Syntax: Form, meaning, and function*. Cambridge, UK: Cambridge University Press.

Van Valin, Robert. 2005. *Exploring the Syntax-Semantics Interface*. Cambridge, UK: Cambridge University Press.