



HÁSKÓLI ÍSLANDS

Hugvísindasvið

**“I shall assume that only binary branching
is permitted”**

*The Development of Binary-branching Theory in English Syntax
in Relation to Double Complement Structures.*

B.A. Essay

Pétur Már Sigurjónsson

May 2012

University of Iceland
School of Humanities
Department of English

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Kt.: 090889-2309

Supervisor: Dr. Matthew James Whelpton

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Abstract

This essay covers the theory of binary-branching in relations to double object and NP+PP complement structures. The discussion moves from generative grammar approaches by Kayne (1986) and Larson (1988) to pre-minimalist approaches by Bowers (1993) and minimalist approaches by Chomsky (1995), Harley (2003, 2007) and Stroik (2001) and finally looks at some opposing approaches headed by Culicover and Jackendoff (2005). The central argument is that strict binary-branching is currently the best method for drawing up tree diagrams as made clear by how it is applied in double-object structures. Kayne's reasoning for appealing for a binary-branching framework is explored first and then the problem of double object structures and anaphor restrictions introduced by Barss and Lasnik (1986). The discussion moves on to examine VP shell analysis and its evolvement since its inception by Larson. From there, predicate phrase structures, as introduced by Bowers, are explored, as well as his adaptation of the VP shell analysis and idea of null causative verbs. The central discussion revolves around the minimalist analysis of light verb phrase structures. Some evidence from cross-linguistic data and idioms is provided for support of the use of light verbs. The most current data provided is Harley's take on abstract verb entities HAVE and PLoc, and how they combine with causative light verbs to form lexical verbs. The essay then moves on to examine passives and whether they fit the same framework as double object structures or not. The essay concludes with some opposing data to binary-branching structures in relations to a linear approach to drawing tree diagrams and subsequent rejection of strictly binary-branching structures as argued for by Culicover and Jackendoff (2005).

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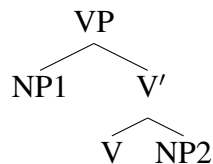
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1 Introduction

In this essay I will demonstrate a number of central components and problems relating to the theory of binary-branching, essentially arguing for its benefits.

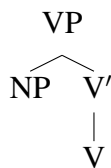
Binary-branching refers to a set operation which is applied within syntax that restricts the way in which sentences are derived and represented within tree diagrams. As the name of the operation implies it allows for every part of the tree diagram to diverge into two nodes with one head and one constituent (i.e. two branches), no more and no less, as demonstrated in (1a). This restriction eliminates the possibility for unary and ternary-branching traditionally found within syntax and as demonstrated in (1b) and (1c).

(1a)



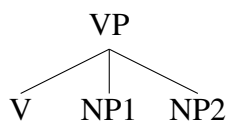
Example of Binary-branching

(1b)



Example of Unary-branching

(1c)



Example of Ternary-branching

In part 2, I recount some of the key aspects in the development of binary-branching theory since its introduction by Kayne (1983) and its functions in respect to Double-Object and NP+PP complement structures, looking at arguments from Barss and Lasnik (1986), Larson (1988) and Bowers (1993). My approach will eventually lead to discussion of the minimalist program in part 3, of which binary-branching is, as I will show, a fundamental part. Part 3 will constitute the bulk of the essay as I demonstrate how a binary-branching approach makes the analysis of

double object and NP+PP complement structures more structured and simpler within the minimalist program approach, referring to recent works by Harley (2003, 2007) and Stroik (2001). In part 4, I take a brief look at some of the more prominent opponents to binary-branching analysis, with emphasis on works by Jackendoff (1990) and Jackendoff and Culicover (2007), to present some contrast to the position taken in this essay. My thesis will be that treating all syntactic structures as binary-branching is highly beneficial considering how verb phrases taking two complements are presented within the binary-branching framework.

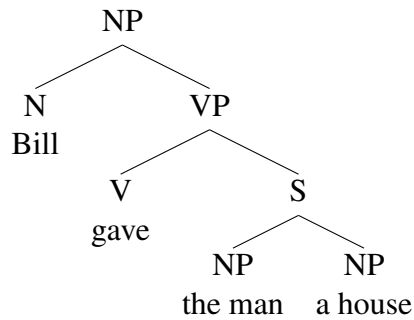
2 Emergence of Binary-branching Theory

Binary-branching remains a widely debated theory within syntax. First introduced by Kayne (1983), binary-branching refers to a principle which is applied to the analysis of sentences in tree diagrams and stipulates that each non-terminal constituent within a tree diagram has two daughter constituents which branch out beneath the mother constituent. Kayne's theory maintains that all syntactic structures are inherently binary-branching and is supported by reference to double-object structures.

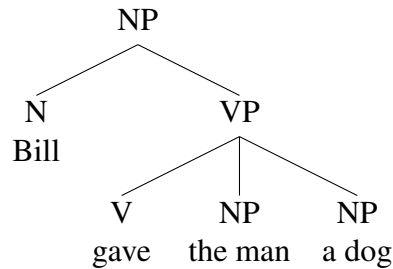
2.1 Double Object Structures

A double-object structure is a sentence containing a verb phrase (VP) which has two noun phrase (NP) complements with the former NP (NP1) being known as the indirect object and the latter NP (NP2) as the direct object. According to Kayne a sentence like *Bill gave the man a dog* takes the (simplified) form in (2), his argument being that this structure allows for the transitive verb *give* to assign case to its two complement NPs by virtue of government. This means that for *give* to be able to assign case to its complement NPs there must be an unambiguous path between the verb (V) and the NPs. An unambiguous path refers to the way in which the speaker processes the sentence, there cannot be any doubt on the speaker's part on how to string together the information he is about to convey. As is demonstrated, this is not possible if *give* serves as a sister to its complements as is the case in traditional ternary-branching structures, such as (3).

(2)



(3)



In the case of (3) the speaker, according to Kayne (1983), will not be able to process the information conveyed because he has to choose in which way to string together the words, allowing for failure in processing i.e. the speaker should be just as likely to interpret the data as *Bill gave a house the man*, taking it to have the same meaning as *Bill gave the man a house*. Since this is not semantically possible, Kayne rejects the ternary-branching option and opts for the binary-branching one, which eliminates all such ambiguities.

2.2 Anaphoric Restrictions

The problem with drawing the structure as is done in (2) can be presented through the use of anaphors as pointed out by Barss and Lasnik (1986). To make clear what is being referred to, I will make a brief summary of traditional binding theory and its relations to anaphors before illustrating how they prove problematic in Kayne's (1983) binary-branching structures. The rules on government and binding of anaphors stipulate that an anaphor, such as *himself* or *each other*, must be bound by its antecedent. Binding refers to structure relations within a sentence, a constituent is considered bound if it is asymmetrically c-commanded by its referring antecedent. C-commanding refers to constituent relations, a constituent alpha (*a*) is said to c-command its sister constituent beta (*b*, adjacent in the tree diagram) as well as all constituents gamma+ (*g*+) contained

within that sister. The constituent *b* also c-commands *a* and all constituents contained within it. The c-command relation is thus realized in (4).



Asymmetrical c-commanding occurs when the constituents do not mutually c-command each other. Therefore *g* in (4) does not c-command *a* despite being c-commanded by it. Binding may be illustrated by contrasting the use of the pronoun *he*, which must be free, i.e. not bound, within the clause containing it (known as local domain), with the use of the reflexive anaphor *himself* (which must be bound within its local domain). The pronoun *he* must not be co-referential with a nominal entity within its local domain (i.e. *he* cannot refer to an entity within its local domain by which *he* is c-commanded), however *he* can refer to a nominal outside of its local domain, either within the sentence structure or some person not even mentioned in the sentence. Therefore in a sentence like (5a), the pronoun *him* can either pick out *John* or some male entity *X* not present within the sentence itself, it cannot however pick out *Bill* since *Bill* is a member of its local domain as indicated by brackets.

(5a) John thinks [that Bill is cheating him]

(5b) John thinks [that Bill is cheating himself]

If the sentence is changed to (5b) only one interpretation of *himself* is possible, i.e. that it refers to *Bill* because (as in the pronominal example) *Bill* is contained within the local domain of *himself*, as again indicated by brackets.

However, in the case of double-object constructs there are some evident problems present with the binding of anaphors as visible from (6a) and (6b).

(6a) John showed Anne herself

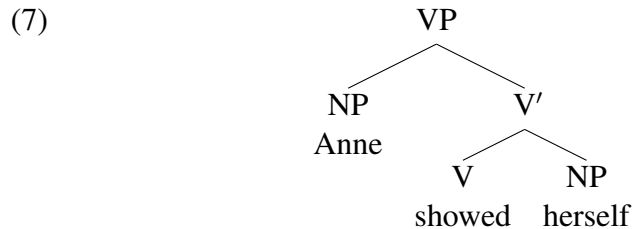
(6b) *John showed herself Anne

If both (6a) and (6b) demonstrate *herself* as c-commanded by *Anne*, then why is (6b) ungrammatical? If we imagine that the structure introduced by Kayne is correct then we

would expect both sentences to be equally grammatical. Since this is not the case there must be some other structure which explains the ungrammaticality of (6b). Barss and Lasnik do not present any solution to this problem, although suggesting that it may be a question of linear approach. What linear approach means is that the two complements could in fact be generated as mutually c-commanding as long as the antecedent precedes the anaphor, not eliminating the possibility of a ternary-branching structure. This will be explored further in chapter 5.

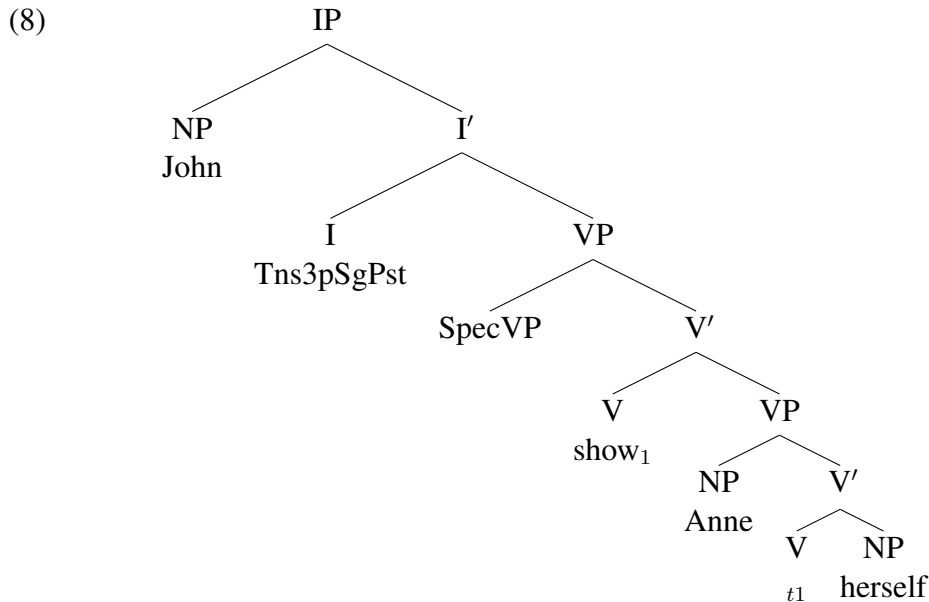
2.3 VP Shell Analysis

Larson (1988) suggests that both objects are formed VP internally in the way presented in (7) within the framework of X-bar theory. X-bar theory is a Chomskyan theory of syntax which has to do with the structuring of phrases. In short the theory involves splitting the phrase of a given functional category *X* into smaller entity within the XP, known as a bar and marked as *X'*. The head *X* of the *X'* also serves as the head of the XP.



The VP in (7) solves the problem of the binding of anaphors, since the NP *Anne* holds the specifier position of VP, it asymmetrically c-commands the anaphor *herself* and (7) can therefore be seen as representing (6a). If *herself* and *Anne* swap places within the structure we then get the ungrammatical counterpart shown in (6b). The structure in (7) appears not to follow the rules of case assignment asserted in Kayne (1983), discussed above, as the V does not govern its two complements and cannot therefore assign case to them both. Larson (1988) suggests that this can be accounted for by V raising to head position of another VP situated above the original VP. This V raising operation fulfils two requirements, first for V to be able to assign case to the indirect object (NP1) and, second, for V to head an immediate projection governed by inflection (I) (which has been replaced by tense (T) in more recent works). This has come to be known as the VP

shell analysis (as the outer VP is semantically empty, like an empty shell) and is demonstrated in (8).



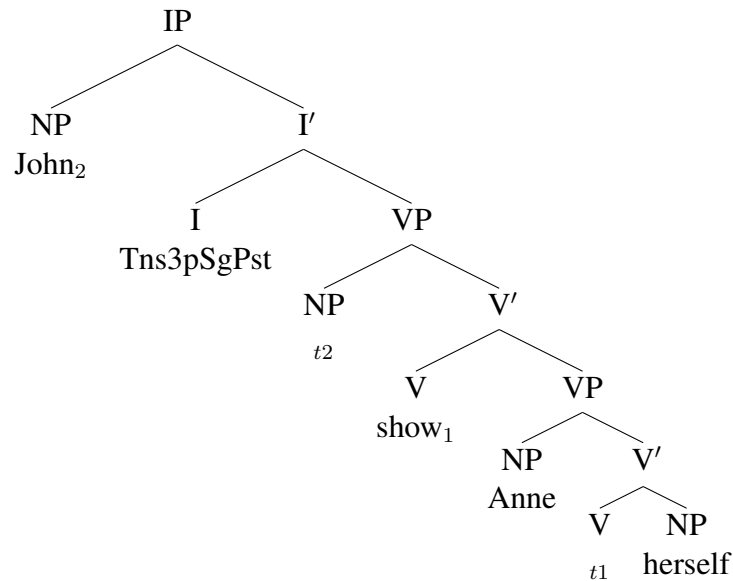
In this structure V originates as head of VP and adjacent to the direct object *herself* which is asymmetrically c-commanded by the indirect object *Anne* that originates in lower SpecVP. V then raises to the empty head position of the upper VP in order to assign case to the indirect object and to head a projection governed by I. All previously mentioned requirements are therefore fulfilled in (8). However we are left with the question of how the direct object receives case. Larsons proposal is that structures containing transitive V, that is a V which assigns accusative case, always carry two accusative cases, one inherent and one structural. In order for structural accusative case to be assigned, V must be governed by I and must in turn govern and be adjacent to its complement (as is indeed the case after V raising has occurred in (8)) and therefore the indirect object takes structural accusative case. For inherent case to be assigned the V must govern and be adjacent to the complement. In (8) the raised V leaves a trace copy (as indicated by *t1* in place of V in the lower VP) which inherits the case assigning properties of V and therefore assigns the inherent accusative case to the direct object. Note that the governing of direct object by *Vtrace* is possible since there is an unambiguous path between *Vtrace* and the direct object.

2.4 Predicate Phrase Analysis

One of the questionable aspects of Larson's (1988) theory (VP shell analysis) as noted in Harley (2007) is how a single V can project two VPs. Larson in fact calls the upper VP a strictly binary-branching structure (Larson, 1988, p. 342) which begs the question of whether the requirement of binary-branching actually supersedes the requirement for semantically relevant content. This (supposed) problem with Larsons analysis is given a different treatment in Bowers (1993), whose adaptation and development of the VP shell analysis moves the discussion closer to the minimalist approach which will be demonstrated later in this essay. Bowers argues that in between IP (or TP) and VP there is a new category which he dubs predicate phrase (PrP for short), with the name reflecting the semantic relevance of this new category. Furthermore, he claims that this PrP is a category contained within every clausal structure. A predicate usually denotes the function of a verb in a sentence so in a sentence like *John talks to Anne* the verb *talks* serves as the predicate and *John* and *to Anne* serve as arguments, the predicate attributes particular roles in the act of talking to each of its arguments. A predicate like *talks* in the previous sentence is known as a two-place predicate since it has two arguments whereas a predicate like *show* in (8) is a three-place predicate as it takes three arguments (Radford, 2009, p. 361, 362).

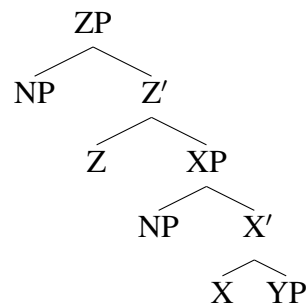
The PrP analysis is in short as follows. Bowers argues that there is something lacking in syntactic theory with assimilating Kurodas (1988) internal subject hypothesis, according to which subjects originate in SpecVP before raising to SpecIP (TP), to a unified definition of the structure of both main clauses and small clauses within the framework of binary-branching and X-bar theory. The raising of the subject from SpecVP to SpecIP, following a VP shell approach, is shown in (9). The subject originates in SpecVP of the inner VP and is raised to IP, while the verb originates as the head of outer VP and raises to inner VP to assign case.

(9)



Bowers suggests that PrP is the missing link in assimilating the internal subject hypothesis with the unified structure of main and small clauses. His unified clause structure hypothesis is shown in (10). He suggests that the PrP allows for all clauses to be drawn in this way with Z representing I in main clauses and V in small clauses and Y representing V, A (adjective), N or P (preposition) in both main and small clauses. X represents PrP in both clausal types.

(10)



(Bowers, 1993, p. 594)

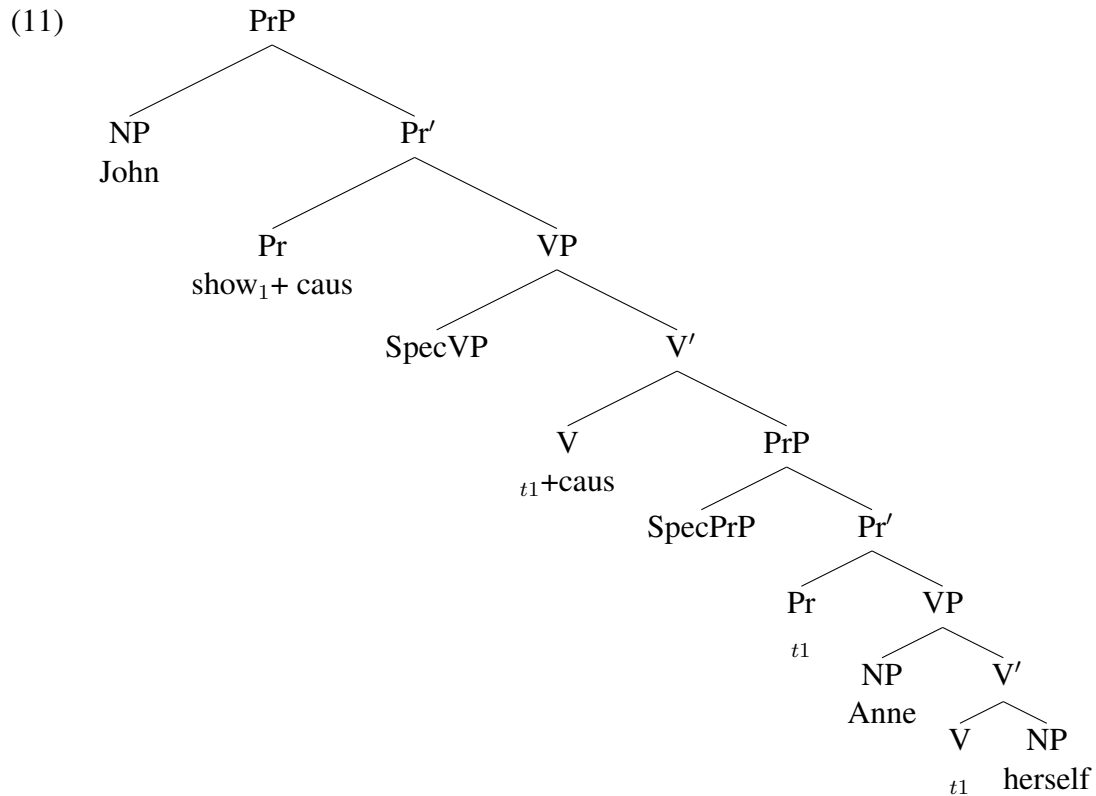
However, it is worth noting that within this proposed PrP category the subject originates in SpecPrP instead of SpecVP, thus not strictly conforming to the internal subject hypothesis but rather adapting it.

2.5 Causative Verbs

To best illustrate how Bowers treats double object structures let us assume that some verbs have a [+caus] feature that must be satisfied for the structure to make sense,

these verbs will be referred to as causative verbs. An example of a causative verb is *show* in a sentence like *John showed Anne herself*, drawn up in (11), which takes the literal meaning John caused Anne to see herself. Furthermore, let's assume that in order for the [+caus] to be satisfied it must be checked by another phonetically empty verb which originates above the lexical verb. Since all VPs project PrP (according to Bowers) and each VP can only be headed by one verb there must also be an accompanying VP and PrP with the phonetically empty [+caus] verb. Now, since the phonetically empty verb satisfies the requirements for checking it attracts the lexical verb to its position through V raising and conforming to head-to-head movement restrictions. Thus V raises from inner V head position to inner PrP head position where it assigns case to the direct object, from there it is attracted by the phonetically empty [+caus] verb head position of outer VP and finally raises to head position of outer PrP in order to satisfy the requirement of heading a structure governed by IP (or TP) and to assign case to the indirect object.

Although this structure seems plausible on all accounts (at least those presented by Bowers himself) one cannot help but feel it is overly large, with V going through three movement operations, which hardly conforms to principles of economy, which call for as simple a derivation process as possible and which we will see later represent a fundamental constraint on syntactic principles in the minimalist program. Further, as will be demonstrated below, some of the double-object structures end up with the V stranded as the only constituent of V', not conforming to the requirements of a strictly binary-branching structure (yet, notably, the same does not apply with NP+PP complements).



2.6 Similarities between Double Object and NP+PP Comp. Structures

Looking at double object structures it is apparent that they are in many ways similar to NP+PP complement structures, also referred to as oblique structures. This can easily be demonstrated by taking the double object sentence *John gave Mary a rope* and reversing the two objects generating *John gave a rope to Mary* requiring only the addition of the preposition *to*. Although the double-object and NP+PP complement structures are similar and express somewhat the same thought, the question remains whether they are formed in the same way or whether they are generated through different operations. It is worth mentioning that Larson argues that the double objects are derived from the NP+PP complement structures, meaning that the double object structures are formed by altering the oblique structure using what he terms dative shift, an operation that he claims is very much the same as the formation of passives. The issue of passives and double objects is taken up further in part 4.

3 The Minimalist Program and Binary-branching

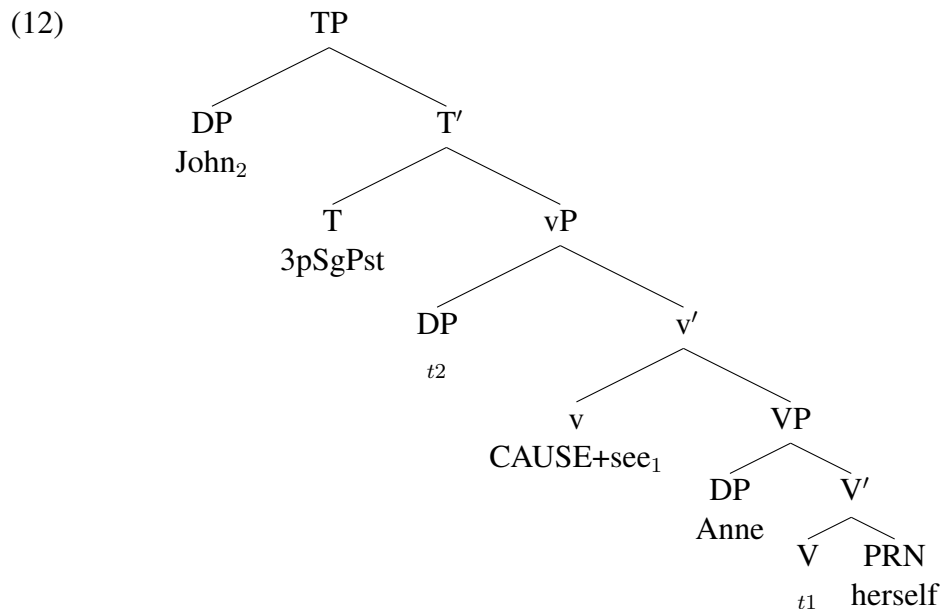
One of the interesting aspects of post binary-branching but pre minimalist program structures is that although the authors do not generally allow for ternary-branching they do in fact allow for unary-branching even though, I would argue, this does not conform to a strict binary-branching procedure. Bowers goes so far as to state that he “shall assume [...] that only binary-branching is permitted” (Bowers, 1993, p. 593) while many of his tree diagrams show a unary-branching terminal node (see for instance his examples number 12, 52 and 120). Within the framework of the minimalist program all such inconsistencies are eliminated by virtue of economy restrictions.

In *The Minimalist Program* (1995), Chomsky hypothesizes that language must be under restrictions of “virtual conceptual necessity” (1995, p. 171), meaning that a speaker should only need to invoke the bare necessity of operations in the syntax to form structures. This assumption leads to a principled account of economy in syntactic structures. Radford explains economy as follows “a principle which requires that (all other things being equal) syntactic representations should contain as few constituents and syntactic derivations involve as few grammatical operations as possible” (2009, p. 335). In developing this theory of minimalism and economy a new method for deriving sentences in tree diagrams, known as Bare Phrase Structure (BPS), is introduced in Chomsky (1995b). BPS is meant to replace the traditional X-bar theory framework, appealing to a flaw in its derivation process (Radford, 2009, p. 78). The strict presentation of BPS requires that category nodes be removed and in fact questions the need for tree diagrams at all (Radford, 2009, p. 79). However, economic as BPS may be, I will keep to labelled tree diagrams in this essay for clarification purposes.

3.1 The Light Verb Approach

The minimalist principles of economy stands in some contrast to Bowers’ double-object structures that involve a wide array of projections (TP-PrP-VP-PrP-VP) and we can therefore expect there to be attempts at creating a more concise explication of double-object structures within the minimalist program. These expectations are met within the framework of the minimalist program through the implication of light verbs

and light verb phrases (designated as vP). Light verbs can be either phonetically empty or phonetically spelled out causative verbs that take a VP complement, much like Bowers' claim of a semantically relevant category situated above VP. However, unlike Bowers' structures, the light verb approach does not require an intermediate PrP between the two VPs, and wholly rejects the necessity of having such a category present at the periphery of all VPs. These light verbs are affixal in nature meaning that the need to attach to a verb, either in front of the verb (prefixing) or at the end of the verb (suffixing). The verb is therefore raised to the head of vP so that the v can attach to it i.e. V is attracted to v. Within this framework a sentence like *John showed Anne herself* would take the simplified form illustrated in (12).



The example provided is fairly straightforward and conforms to the restrictions previously discussed. The V *see* originates as the head of VP taking the immediate complement pronoun *herself* as well as the complement determiner phrase (DP), a developed form of NP, *Anne* which originates in the SpecVP position. *Herself* is asymmetrically c-commanded by *Anne* as is required by anaphoric restrictions. Since *see* unambiguously c-commands the direct object *herself* it can be assigned inherent case. To meet the requirements of the causative light verb *CAUSE* of attaching to a lexical verb as well as the structural case assigning requirements, *see* is raised to the head of vP, attaching to the light verb. In order to meet their feature requirements of taking a single morphological form, the v+V (*CAUSE+see*) then combine to form the word *show*, as

argued for by Bowers (1993), which is in head position of a projection governed by T and can therefore assign structural case to the DP *Anne*. The DP *John*, which originates in SpecvP is then raised to SpecTP to meet the requirements of TP. T, which is affixal in nature, but does not have the attraction feature of v, moves down to v head position through affix hopping, attaches to the newly formed *show* and merges with it to create the form *showed*. Thus the sentence *John showed Anne herself* is formed within the light verb framework of the minimalist program. Radford in fact illustrates that all syntactic structures are formed as VP shell structures, meaning that all VPs are subordinate to a vP (2009, p. 280), this however will not be delved into here.

3.2 Support for the Use of Light Verbs

Harley (2007) provides some interesting rationale for having two functional verb projections which I will explore in the following paragraphs. They relate to semantic functionality in relations to idioms and cross-linguistic morphological evidence.

3.2.1 Idioms

Harley refers to Marantz' (1984) semantic analysis of idioms which explores why idioms tend to be verb-object (excluding the subject) related rather than subject-verb related (excluding the object).

- (13)
- bring home the bacon = provide money
 - take the high road = do the right thing
 - bite the bullet = to endure something difficult

All the idioms in (13) demonstrate a verb-object idiom where the verb, adjoined to the object, provides some novel meaning. Harley notes that there must be some underlying reason for there not being any idioms like *the girl took* or *the elephant brought* that have some other meaning than their literal one. This is allegedly due to the light verb blocking the direct connection between subject and verb i.e. because the structure is [subject - light verb - verb - object] the light verb gets in the way of the verb composing directly with the subject, thereby eliminating any possibility of subject-verb idiomatic relations.

Thus it could be argued that the subject composes with the light verb while the object composes with the functional verb. In idioms the subject is therefore semantically independent while the object is semantically dependent on the functional verb. This fact provides a strong argument for the presence of a light verb between subject and verb in all syntactic structures.

3.2.2 Cross-linguistic Evidence and Verb-Particles

Taking examples from Japanese, Hiaki and Persian as well as English, Harley demonstrates how all four languages show some noteworthy similarities when it comes to causative verbs despite being from quite diverse language families (Japonic, Uto-Aztecan, Indo-Iranian and Germanic) and being all in all quite different from one another. The data provided shows that the three non-Germanic languages all have verbs that attach a distinct affix to their root in causative form. English of course does not have the same morphologically rich verb features as the other languages do, but Harley proposes that the same properties apply to English as the other languages with verb-particle constructions.

(14) *Give* the game *up* - *give up* the game

Put the toys *away* - *put away* the toys

Take the books *back* - *take back* the books

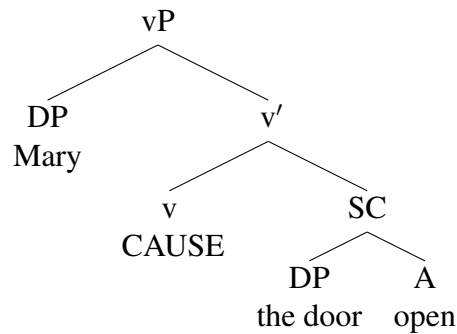
The verb-particles in (14), shown in italics, are essentially inseparable to the meaning they convey although they can either stand together or be split. For instance, the first example, *give up*, carries the same essential meaning in both cases but if the prepositional particle is removed and *give* is left to stand on its own the phrase shifts or loses meaning. Since the two parts cannot be separated semantically they must in fact both be a part of the same, albeit complex, verb. How then do we account for their being able to separate within the syntactic structure itself? Harley (2007) suggests that this is due to them occupying separate roles within the structure. *Give* occupies the vP head position due to the fact that it is the causation part of the act of *giving up*, while *up* sits in the predicate position of a small clause (since it is not a lexical verb in and of its own)

and exhibits resultant state of the proposition. Then to form the latter examples of each part in (14) the particle simply raises to head position of vP, adjoining to the causative verb. The evidence of verb-particle structures in contrast with other language properties makes a solid argument for the existence of the light verb category. A possible problem with Harley's analysis is that although she does show the causative verb relations in diverse language families she presents no example of light verbs in other Germanic language. Therefore the argument could be made that perhaps it is a property of Germanic languages not to have light verbs since English (the only Germanic example provided) is not as morphologically rich as languages of other families. As already noted there are other reasons for treating the light verbs as existent, this supposed problem is only brought up to illustrate that the cross-linguistic evidence is not enough in itself for drawing conclusions on light verbs.

3.3 Abstract HAVE and PLoc

A questionable aspect of Harley's (2007) arguments is that at one point she removes the VP category from her structures, replacing it with a small clause (SC), while retaining vP as usual. There is not much space wasted initially to explain why this is, but it is done partly for economic reason and partly to denote "its predicational and propositional nature" (2007, p. 13). For clarification purposes, a small clause is a clause containing a non-verbal predicate, so in a sentence like *Bill finds Anne boring* the phrase *Anne boring* constitutes a small clause as the property of being boring is predicative of Anne (much like the property of finding is predicative of Bill). With the examples of the verb-particle constructions noted above the distinction is quite clear since the V is split into two parts, one of which is not verbal and therefore fits naturally as a predicate of the SC. In Harley's example 21 (2007, p.14), where the sentence is *Mary opened the door*, which is clear has no verb-particle construct, the things start to get tricky. Assuming that the vP is ever present, Harley denotes v as *CAUSE* while the "lexical verb" originates in predicate position of the SC as an adjective (A), so the initial form of the sentence is (15).

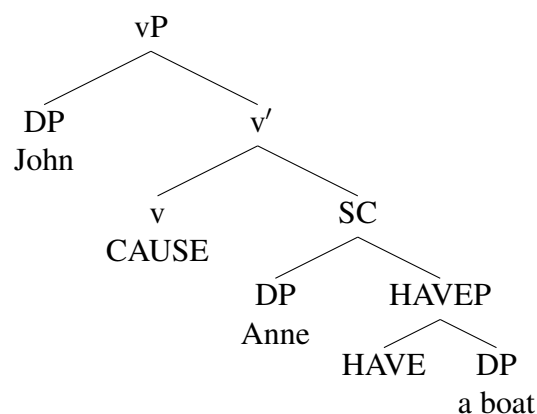
(15)



Now because the light verb has a null spellout it attracts the A to its position and, serving as a verbalizer, attaches to the A creating the lexical V *open*. In short the A is treated like a root which, when attracted to v position, is transformed into a verb, explaining how a clause with no overt lexical verb can in fact contain a verb. This is similar to the data Harley (2007) provides from Persian where non-verbal categories combined with a light verb form a new verbal element.

This discussion leads to Harley's treatment of double object structures. Harley argues that, much like in the verb-particle structures, the lexical verb actually originates in head v as a causative verb and that the SC complement of vP contains an abstract HAVE phrase which denotes the possession requirement of the indirect object. Hence the lexical verb is not in fact contentful in the way one would expect; it serves to identify the manner of causation and is in fact generated by the raising of HAVE to CAUSE (Harley 2003).

(16)



Using *John gave Anne a boat* (16) illustrates how this sentence looks. Here the abstract HAVE is in the head of the predicate position of SC taking the two arguments *Anne* and *a boat*. The causative light verb CAUSE attracts the abstract HAVE to its position so that the sentence ends up as being *John CAUSE HAVE Anne a boat*, where CAUSE and

HAVE combine to form *John give Anne a boat*. Note that the same does not apply to NP+PP complement structures due to the animacy constraint.

The animacy constraint refers to the central difference between double object constructions and NP+PP complement structures. As already discussed most double object structures can be realized as NP+PP complement structures through quite slight alterations. The main difference involves the GOAL theta role being moved from the inner position (where it originates in the double object structure) to the outer position adding a prepositional element. Theta roles are semantic categories assigned to different arguments within a sentence which represent their role within the structure. A subject will conventionally take the role of AGENT, and the object(s) either THEME or GOAL depending on its function. Thus the sentences in (17) show the alternating difference of the GOAL theta role in both double object and NP+PP complement structures.

(17) John gave [GOAL Anne] a shoe.

John gave a shoe to [GOAL Anne].

An interesting fact about these two forms of the same information is that the double object construct is more restricted in terms of a GOAL argument. The GOAL argument of a NP+PP complement structure can be either animate or inanimate whereas the GOAL argument of double objects can usually only be animate as demonstrated in (18).

(18) *John sent [GOAL the house] a package.

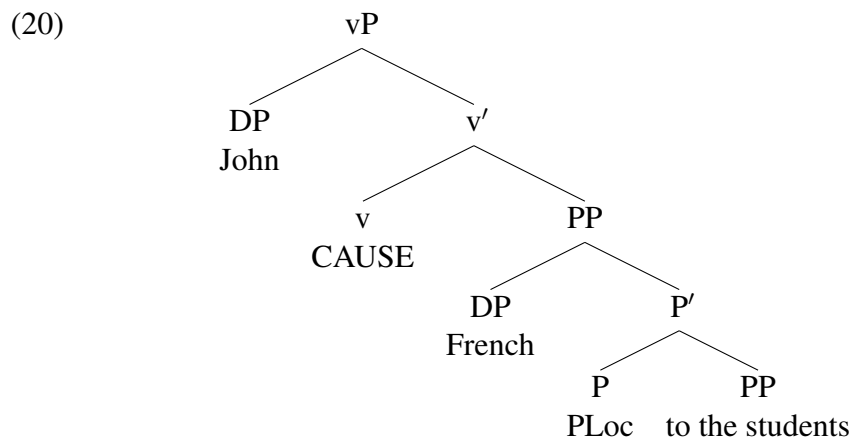
John sent a package to [GOAL the house].

What this means for Harley's approach is that the abstract *HAVE* element does not really apply to NP+PP complements since *HAVE* implies possession, which cannot be predicated of inanimate objects, therefore she does not analyse the NP+PP complement structures in the same way as she does double object structures. Instead she notes that much like double object structures imply that the GOAL theta role is filled by a possessor, as indicated by abstract *HAVE*, the NP+PP complement structure GOAL theta role implies a location, as indicated by the abstract locative preposition *LOC*, or *PLoc*. It is fitting that the differences inherent in the two structures be introduced by one of Oehrle's (1976) more famous examples (quoted in Larson, 1988, p. 376).

(19) John taught the students French.

John taught French to the students.

Although these sentences contain the same information on the surface, with the only apparent difference being the preposition *to*, Larson claims that the double object sentence implies that the students actually learnt something but the NP+PP complement sentence can only be taken to mean that John attempted to teach the students French either successfully or unsuccessfully. Larson does not go into more detail on this implication of semantic difference but it is crucial to Harley's (2003) treatment of the two types of structure. Harley states that all double object structures are distinct from NP+PP complement structures because the former always indicate possession and the latter always indicate location. The NP+PP complement structure as suggested by Harley (2003) is drawn up in (20).



As with the double object structures containing HAVEP illustrated in (16) the abstract entity, here the preposition *PLoc*, originates as head of a PP with PP *to the students* as its sister constituent and DP *French* in SpecPP. The causative light verb is in head position of the light vP taking *French PLoc to the students* as its complement and having DP *John* in SpecvP. The abstract *PLoc* then raises to head vP to attach to *CAUSE* generating the verb *teach*.

3.3.1 Deriving Meaning from Abstract Have and PLoc

One of the supposed problems with using abstract HAVE and PLoc is the fact that they are indeed abstract, raising the question of how these abstract entities combined

with CAUSE can generate the correct verb in the spell-out. Harley answers this by referring to data on Distributed Morphology. The framework of Distributed Morphology supposes that “primitives which serve as input to the syntax and are manipulated by it are not fully formed phonological words, but morphosyntactic features and other primitive building blocks [...] which the syntax Merges and Moves” (Harley, 2003, p. 62). These primitive building blocks are features such as HAVE, PLoc and light verbs. The final outcome of this merger of features is then in fact an educated guess based on established, internal encyclopaedic information which fit the requirement of the abstract entities as well as the intent contained within the sentence itself. Compared to the complex structure introduced by Bowers (1993) Harley’s analysis clearly conforms to principles of economy, allowing for no unnecessary categories or empty positions in the derivation process.

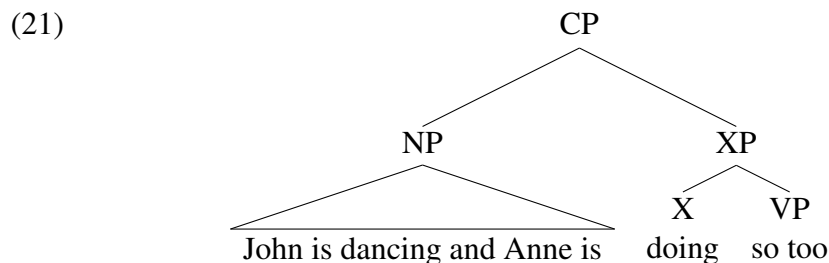
3.3.2 Case Assignment of Light Verbs and Abstract Entities

We are left with the question of how case is assigned in the double object structure analyses approach that Harley adopts and whether abstract HAVE and PLoc can in fact be case licensors. Harley does not cover this issue but Radford (2009) does note how causative light verbs can act as case licensors in single complement sentences. It is suggested that the light verb probes for a constituent with matching person and number features but with an unvalued case feature. Having identified a constituent which meets these requirements the light verb then assigns case to the same constituent (p. 281). Radford does not go into case assignment in double object structures within this abstract minimalist framework but Chomsky’s (2000) Agree proposal, with the verbal element of each corresponding phrase being the case licensor of their complement(s) via c-command may possibly be adopted here. Then it could be that case assignment is split between the two abstract entities light verb CAUSE and abstract HAVE, where HAVE assigns case to the indirect object and CAUSE assigns case to the direct object. This procedure would then in fact be an extension of the case assignment in single complement light verb structures. HAVE and CAUSE, as the heads of their respective phrases, could then be said to both be probing for constituent with matching person and number features and unvalued case features. If it is then assumed that HAVE and CAUSE

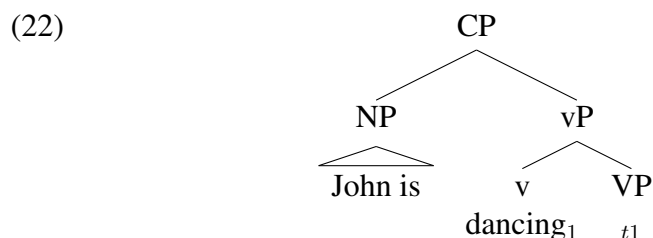
can only identify one such constituent, it follows that they select their closest constituent. In the case of HAVE it is the direct object in its complement position but with CAUSE it is the indirect object situated in specifier position of its complement phrase.

3.4 Light Verbs and *do+so* Evidence

Stroik (2001) also has some reasons for treating light verbs as semantically functional, taking exceptions to discussions treating light verbs as solely relevant as theory internal category. He claims that the helping verb *do* + *so* (non-auxiliary *do*) is present in a parallel way to light verb structures as it heads an XP projection prior to the main verb as well taking it as a complement, with *so* in fact standing in place of V.



The literal interpretation of (21) is John is dancing and Anne is doing dancing too since *so* stands in for the verb in the lower VP. He goes on to identify this XP category as vP, claiming that its purpose is fundamentally to check the morphological feature [Vform] of the main verb. The fact that helping verb *do* heads a vP projection above a verbal *so*, containing the same properties as a main verb, suggests that this must also apply to the main clause *John is dancing*, only with a null verb attracting the main verb dancing to check its [Vform] feature. The structure is then realized as (22).

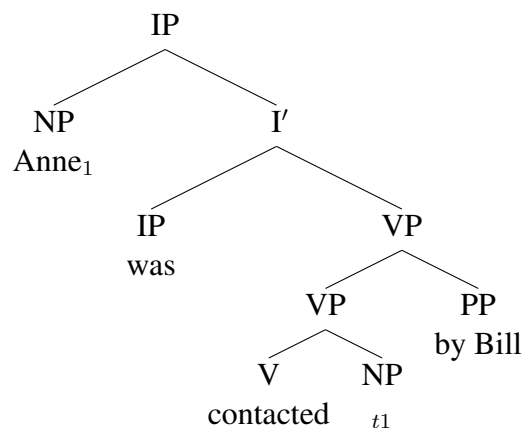


Stroik's arguments thereby add yet another facet to the motivation for light verb analysis in all syntactic structures.

4 Analogies between Passives and Double Object Structures

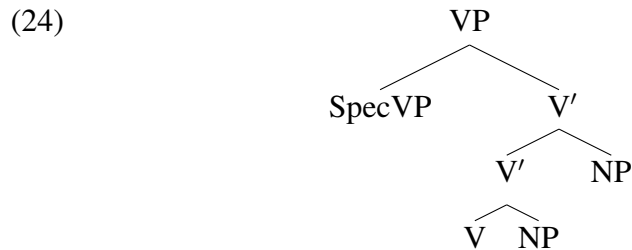
The discussion of treating double objects similarly to passives is taken up in Larson (1988). Larson notes that there are some distinct similarities between the formation of passives and the formation of double object and NP+PP complement structures which he argues serves to illustrate that the same processes apply in the emergence of both types of structures. According to Larson there are essentially two major components involved in forming passives “withdrawal of Case from an object position, and suppression of thematic role assignment to a subject position” (1988, p. 351). This means that a sentence like *Anne was contacted by Bill* is formed in the following way. The verb *contacted* originates as the head of inner VP and takes the NP *Anne* as its complement. The outer VP has the suppressed subject *Bill* as its adjunct, taking the case marking preposition *by* to form the PP *by Bill*. In this sentence adjunct refers to the optionality of the PP, meaning that it serves as information that is not crucial to the understanding or grammaticality of the sentence (Radford, 2009, p. 321). The auxiliary verb *was* originates in head position of I'. The requirement for a subject is then filled by the object *Anne* raising into SpecIP position making the sentence as shown in (23).

(23)



It must not be forgotten that the suppressed subject *Bill* does not necessarily have to be spelled out in order for the passive sentence to be grammatical, it could just as well be *Anne was contacted* but the sentence along with the adjunct PP is preferred here as it better demonstrates how closely related the passive and double complement structure analysis are according to Larson’s claims.

In order to make the double object structures fit with the formation passives the VP is altered slightly from what has previously been demonstrated, it is now as is shown in (24).



This structure does at least to some extent appear to be over complicating things in order for them to fit the Passive relational account. In fact this structure is directly derived from the NP+PP complement structure as Larson talks about the Passive operation absorbing the case inherent in prepositional *to*, removing it from the indirect object. The direct object then undergoes adjunction which explains why it is a constituent of the upper V'. Finally the indirect object raises from its deep position into SpecVP position. Larson suggests that the operations at play here in the passive as well as in the double object framework are the same with NPs moving into Spec positions in both cases. This he dubs Passive in the case of passive and Dative Shift in the case of double objects but he refers to the operations at play in both cases as PASSIVE. What this implies of course is that both operations are an alternatives representation of other structures (active and NP+PP complement structures). He goes on to draw up some of the major differences between passives and double object constructs including the form of the main verb in the structure (active form in double objects, + en ending in passive), the possibility of suppression of the adjunct phrase (no suppression in double objects, suppression possible in passives) and the increased restrictions of productivity in double object structures. This illustrates that although the operations follow the same blueprint they diverge enough to make each distinct from the other.

I would now like to draw attention to Harley's (2003) treatment of passives. As has previously been discussed Larson draws up similarities between the formation of passives and double objects and it is therefore fitting to see how these relations are treated within a more current framework. Suffice to say, based on her analysis of double object structures, Harley is opposed to the view that double objects are derived from

NP+PP complement structures through the passive like operation of dative shift. Again she refers to idioms for support of her argument. Harley claims that if the dative shift operation applies to double object structures it can be expected that (at least some) NP+PP complement idioms are able to go through this operation since some idioms are known to be able to passivize.

(25) Caesar threw the gladiator to the dogs.

*Caesar threw the dogs the gladiator.

(26) John did not give Anne the time of day.

Anne was not given the time of day (by John).

In (25) the NP+PP complement idiom is grammatical whereas the corresponding double object structure is completely ungrammatical and does not follow the idiomatic interpretation. Looking at the idiom in (26) we see that it can passivize and keep its idiomatic meaning unaltered. If Larson's (1988) claims for passive and dative shift operations apply in the same manner we would expect both operations to work with idioms. As this is not the case there is choice left but to reject Larson's dative shift as a passive like operation. This also supplies further evidence to Harley's claim that the double object structures are not merely a derivation of NP+PP complement structures, but rather independent operations as previously illustrated. It should be noted that the example provided in (25) cannot in fact passivize and still keep its idiomatic interpretation; *the dogs were thrown the gladiator (by Caesar)*, however this does not mean that Harley's argument is rendered invalid as she only aims to show that some (not all) idioms can passivize while keeping their idiomatic meaning whereas no idiomatic NP+PP complement structure that I know of can be shifted to a double object structure while keeping its idiomatic, or in fact its grammatical, interpretation.

5 Opposition to Binary-branching Structures

Although binary-branching is supported and preferred by many there are those that oppose it, at least in relations to double-object structures. One of those opposed is

Ray Jackendoff who has taken a somewhat different stance in the matter which can be traced back to Jackendoff (1990). In his article Jackendoff contradicts some of Larson's (1988) claims, suggesting that they are fundamentally flawed and lacking in support. Jackendoff appeals for a linear approach to double-object analysis, referring back to Barss and Lasnik (1986). He suggest that rather than introduce a novel construction based on binding asymmetries that the conditions on binding should be re-evaluated given the data presented and follow a linear structure instead in the case of double-object structures, still working within a ternary-branching framework. Jackendoff supports his linear order preference by reducing Larson's argument to mere wishful thinking. Jackendoff for instance finds fault with Larson's analogy of passives and dative shift as he notes that passive does not work on anaphoric sentences such as (27).

(27) *Bill was hit by himself.

(28) Anne was shown herself.

However, I would argue that they do in fact sometimes work as is evident from the grammaticality of the passivized double object sentence in (28), rendering Jackendoff's counter argument doubtful, even though Larson may have been working under the wrong assumptions in his PASSIVE framework as discussed above. Larson (1990) refutes the claims made by Jackendoff (1990) of him ignoring empirical data and claims that his structural approach could not be ruled out by linear structure claims alone.

5.1 Simpler Syntax

A much more recent work which, along with other subject matter, deals with binary-branching and VP shell analysis is Culicover and Jackendoffs book *Simpler Syntax* (2005) which aims to introduce their Simpler Syntax Hypothesis (SSH) and flat structures. As pointed out by Larson (1990) the linear ordering that Jackendoff (1990) argued for is "potentially quite flat" (p.590) and, as linear order is one of the central components in the SSH, the tree diagrams represented diverge quite dramatically from the framework of binary-branching, and are, as a result, very flat. Furthermore the category of T has been eliminated and no movement of constituents is allowed within the structure. Culicover and Jackendoff list some of the support for binary-branching

analysis while bringing up possible counter-arguments. One of the claims they make is that assuming binary-branching is the only possible mode of derivation does not necessarily make it any easier to derive the structure of the sentence since the restrictions on derivation allow for endless new nodes and branches to be generated in an attempt to make the structure fit the framework (2005, p. 113). They go on to claim that allowing n-ary (undefined number) branching is not the same as rejecting projections of head words or categorical relations, the only thing that is changed is the removal of branching restrictions. Their discussion leads to the assertion that binary-branching has in fact become a comfortable restriction applied by linguists so as to not have to think about it while discussing other issues and that it is an archaic restriction based on limited empirical motivation (p. 116).

The arguments presented in Culicover and Jackendoff (2005) does raise the question of whether binary-branching has enough support to still be uncritically used in modern syntactic theory. Does it not overly limit the possibilities available within the syntax? My argument would be that its limitations are in fact positive and natural in terms of Chomsky's theory of Universal Grammar (UG) which appeals for universal properties of language that simplify the learning of languages based on parameters which are tested by a child while acquiring its language (Radford, 2009, p. 363). If we reject binary-branching we are in turn rejecting the implications of UG pertaining to selection of parameters. Culicover and Jackendoff argue that flat n-ary branching structures require no more of the child than binary-branching structures which is simply false given the fact that knowing that sentences only diverge into two rather than having to select whether at a particular point of derivation to diverge the constituent into one, two, three, four or more branches probably requires less of the learner.

6 Conclusion

My discussion has covered some of the essential data relating to binary-branching and its implications concerning double object and NP+PP complement structures as first noted by Kayne (1983). Although my essay does not provide any revolutionary data in the field it does provide rationale for treating binary-branching as a central component for analysis of double object and NP+PP complement structures

under the minimalist program approach introduced by Chomsky (1995a) and furthered by Harley (2004, 2007). There continue to be developments in the field of syntax and although binary-branching is widely accepted today it may just as well be disregarded in the coming years, possibly as a result of Culicover and Jackendoff's (2005) theory of simpler syntax gaining increased support. I maintain, however, that binary-branching is currently the most probable method for analysing the constituent structure of sentences in a constrained and straightforward manner within tree diagrams.

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